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R/C CAR

THE RADIO CONTROL CAR MAGAZINE

NOVEMBER 1999



Triple-X Files

WE RACE LOSI'S NATIONAL CHAMP, AND IT'S AWESOME!

Off-Road World Champs!



GIANT RACE SECTION!

- INSIDE THE CONTROVERSY!
- EXCLUSIVE LOOK AT THE WINNERS AND THEIR CARS!

NEW SCHUMACHER 2WD RACER TAKES ON LOSI AND ASSOCIATED!

AVOID THE DREADED DNF!

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TAMIYA'S MINI GETS A NITRO TRANSPLANT!

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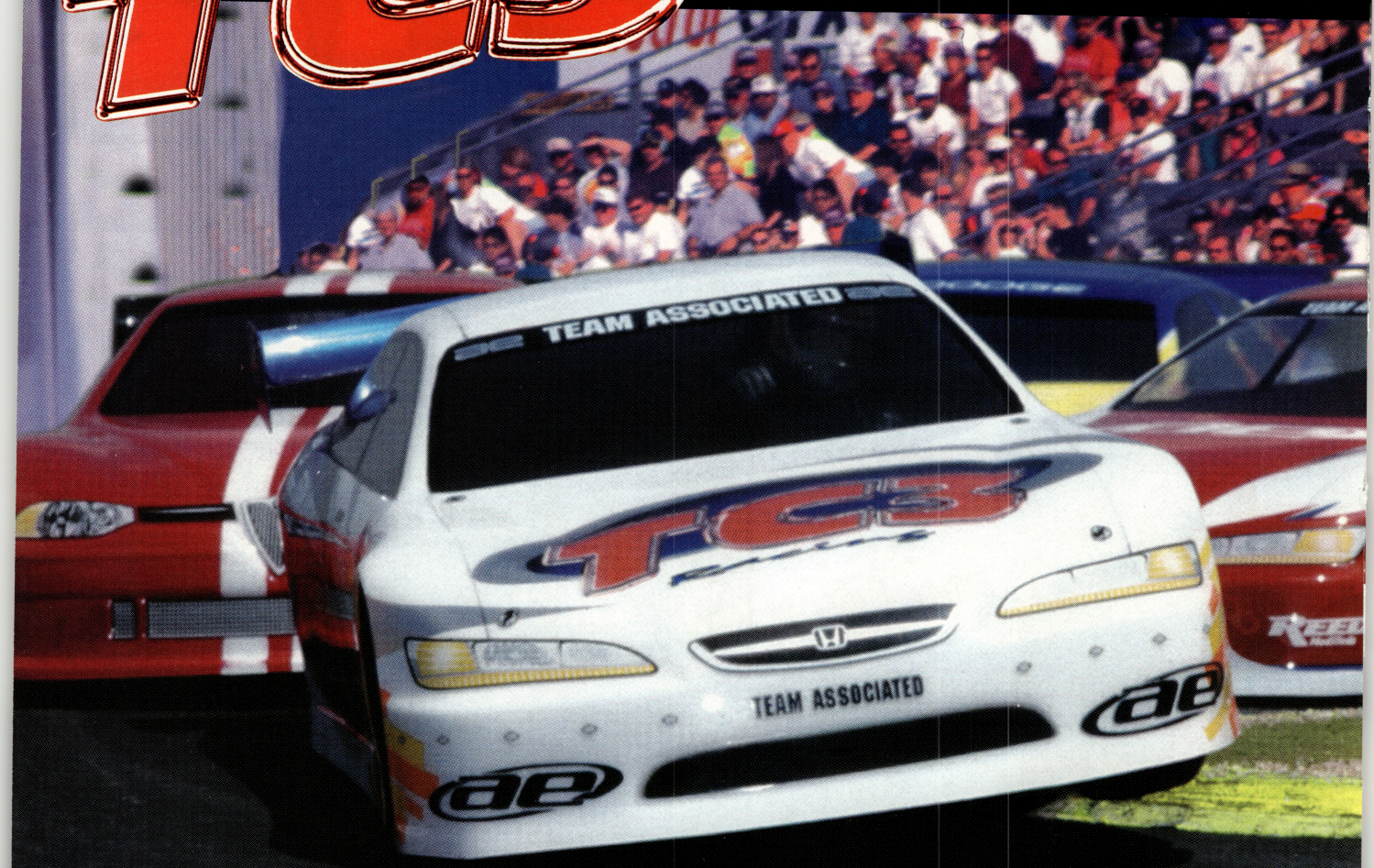


AND TOURING CARS WILL NEVER BE THE SAME AGAIN.

In the beginning, it was known as "Project Roswell." And although we don't claim to have designed the new TC3 with the help of any "alien technology," we did venture into design and manufacturing techniques far beyond where we'd ever gone before.

We started with a clean slate, designing the TC3 from the ground up specifically as a touring car... not a converted 4WD buggy. An all new, computer-optimized shaft drive system proved to be the most efficient, durable, and serviceable drive train possible, and eliminated the design compromises inherent in belt-drive systems. The TC3 uses our race-proven, carbide-ball equipped Stealth differentials and MIP CVD's both front and rear for a smooth transfer of power. ProLine's new spoke design, standard hex-mount wheels with their V-Rage tires enable the TC3 to hook up on most any track.

The TC3 Racer kit features precision stainless-steel sealed ball bearings, a big improvement over the bushings found in many other manufacturer's "budget" kits. MIP composite CVD's are included, as well as our composite-bodied VCS Macro Shocks for smooth, adjustable damping all around. And, you get your choice of three popular ProtoForm sedan bodies: the Honda Accord 4-door, Dodge Stratus, or the Alfa Romeo.

The TC3 Team kit includes "Factory Team" blue titanium turnbuckles, Teflon-sealed ball bearings, blue-anodized aluminum-bodied VCS Macro Shocks, and blue-anodized MIP CVD's. If you want to both go fast and look good, this kit is it!

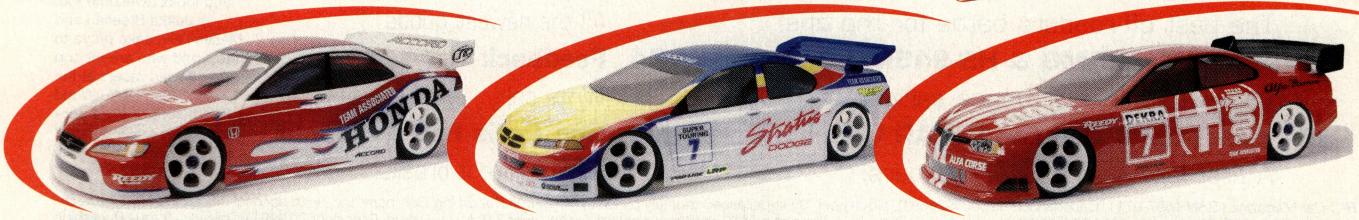
Built for the serious sedan racer, the new RC10TC3 is simply the most technologically-advanced touring car on the market today. And yes, it *is* rocket science.



TC3 Team Kit
#3030 also includes:

- **Factory Team Blue Anodized VCS Shock Bodies**
- **Factory Team Blue Titanium Turnbuckles**
- **Blue-Anodized Alloy MIP CVD's**
- **Factory Team Teflon-Sealed Ball Bearings**

RC10 TC3



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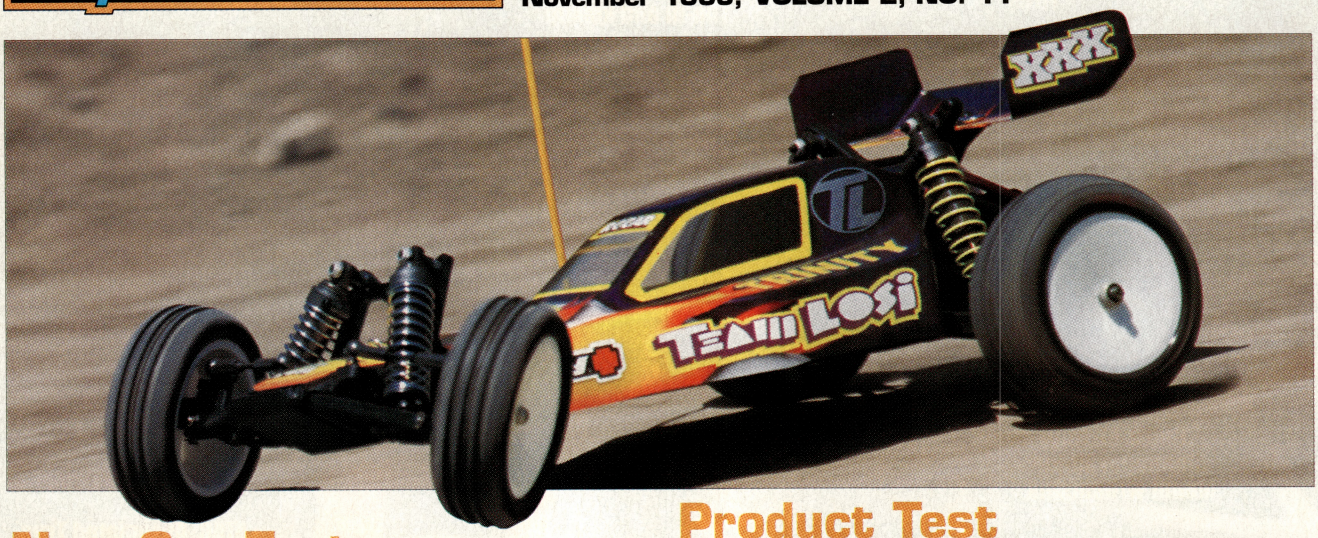

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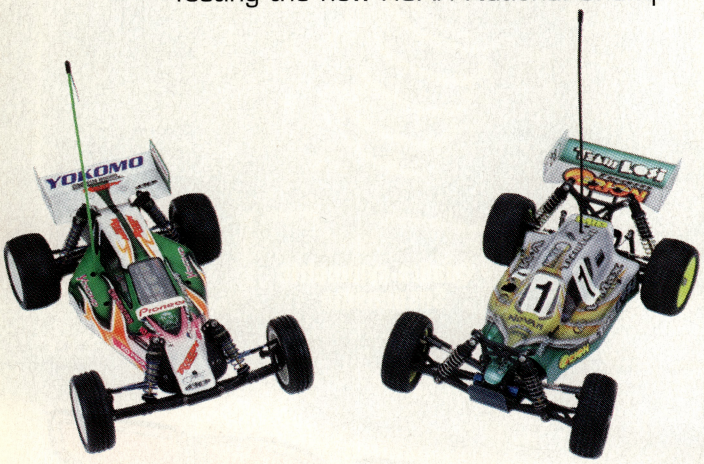



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On the cover: Team Losi's new Triple-X buggy rocked the ROAR Nats. Will it also take the title of best buggy out there now? Tamiya's new 1/8 scale nitro-powered Mini Cooper is a blast to drive and looks awesome too! Jukka Steenari and Masami Hirosaka prove to the world who are the top two off-road racers at the 1999 IFMAR World Championships. All photos on the cover and this page by John Howell.

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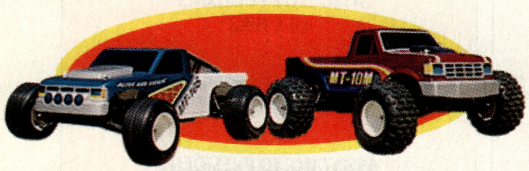

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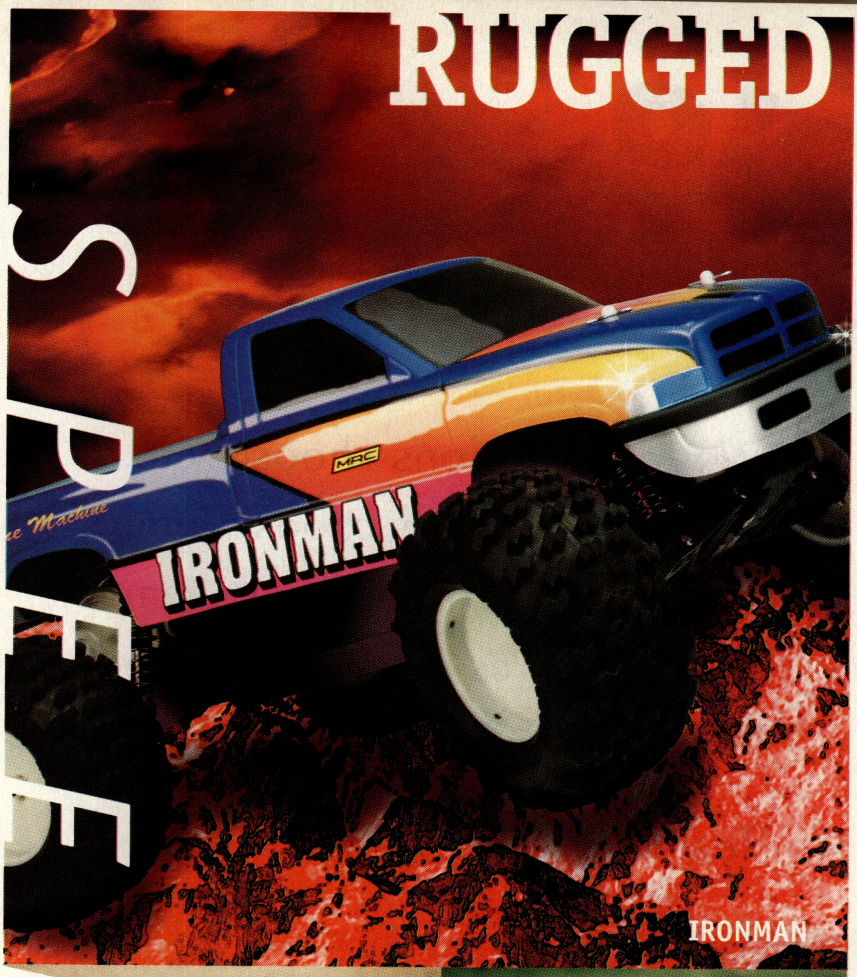


IRONMAN

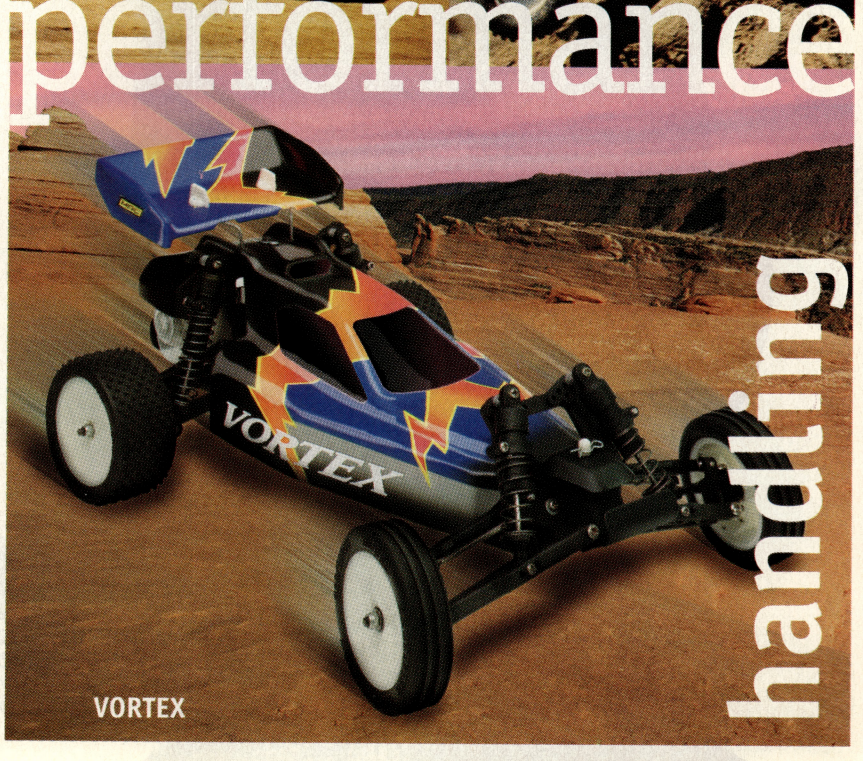
MT-10S

MT-10M





performance



handling

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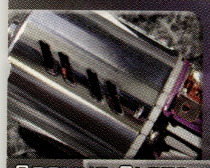
IFMAR WORLD CHAMPION



COOLING SLOTS

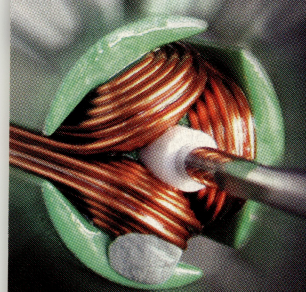
TEAM ORION
CHROME MODIFIED



WORLD CHAMPION



ULTRA FLOW ENDBELL



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JIMMY JACOBSON
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1999 WORLD CHAMPIONSHIPS



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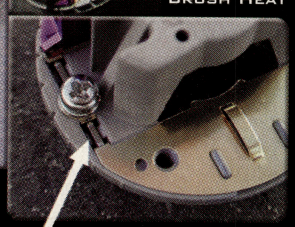

SURFACE MOUNT CAPACITORS!



JUKKA STEENARI
1999 IFMAR 4WD OFF-ROAD WORLD CHAMPION

The results are in, Team Orion drivers swept the top spots at the IFMAR Worlds in Finland. Jukka Steenari is the new 1999 IFMAR 4wd World Champion, Jimmy Jacobson took 2nd place, Temu Leino 4th place and Teppo Kaupinen 5th.

Team Orion's Daren Westman and Oscar Jansen were on hand to tune the new TOP Advanced Technology based Chrome Modified Motors. Increased power and efficiency gave Team Orion drivers the edge in the fierce competition.

All of the Team Orion drivers used V-Max Plus RDS RC2000 batteries matched at 30amps using our RDS (Race Discharge Simulation). For complete results and a information on the winning set-ups, visit our web site at www.team-orion.com.

OFFICIAL RESULTS

1999 IFMAR OFF-ROAD WORLD CHAMPIONSHIPS
TEAM ORION TAKES 1ST, 2ND, 4TH, 5TH

	Driver	Motor	Battery
1.	Jukka Steenari	Team Orion Chrome 9x2	Team Orion V-Max Plus Sanyo
2.	Jimmy Jacobson	Team Orion Chrome 9x2	Team Orion V-Max Plus Sanyo
3.	Brian Kinwald	Trinity	Trinity
4.	Teemu Leino	Team Orion Chrome 9x2	Team Orion V-Max Plus Sanyo
5.	Teppo Kauppinen	Team Orion Chrome 9x2	Team Orion V-Max Plus Sanyo
6.	Mark Francis	Trinity	Trinity
7.	Mark Pavidis	Reedy	Reedy
8.	Scott Brown	Trinity	Trinity
9.	Brian Dunbar	GM	GM
10.	Matt Francis	Trinity	Trinity

Chrome Motor Features:

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- *Color Coded Heat Sinks*
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- *Thick 1.4mm Can*
- *Pattern Wound™*
- *Epoxy Balanced*
- *High Temp Solder*
- *Diamond Trued Comm*



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Matched at 30 Amps to simulate race conditions on the precise Team Orion Matchpoint Rev.2 matching system. V-Max Plus RDS (Race Discharge Simulation) are the fastest, most accurate and most powerful batteries in the world!

Team ORION

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drivers' stand

by Frank Masi



Our races are all "run what ya brung," which means that if it's R/C and you can drive it, you're welcome.

The bulk of the expense went toward these cans of driveway resealer, which run between $10-15 per can. This stuff fills in all the imperfections and provides a clean, smooth surface.

Are you a racer or not?

Today, I've come to the realization that I am a racer. This came about after a long period of consideration of the hobby activities of the average R/C enthusiast. Do most people race their R/C cars, or is there, indeed, some huge number of people who are content to drive all by themselves? I don't buy it!

You want to know something? Ask any industry folk about the statistics, and they'll tell you that few of their customers race. I believe the "accepted" industry figure pegs about ten to 12 percent of all R/C car and truck owners as racers, with the rest categorized as "backyard bashers," a term that I could certainly do without—and I'm sure that if you are a "BB," you could do without it too! What, are you out in your backyard with a mallet and lighter fluid or something?

I'll tell you what I think: I believe that given the chance to drive their cars and trucks on some sort of track, against other cars and trucks of similar size and speed, that a much greater percentage of R/C owners would classify themselves as racers. I've been building and running R/C kits for nearly fifteen years, and as soon as I learned to drive and got the whole "left coming at you, right going away" thing mastered, I began looking for other R/C drivers to embarrass!

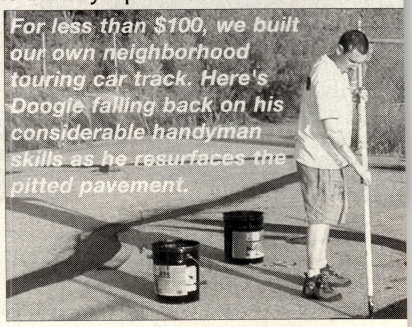
This by no means is meant to insinuate that everybody's going to go out and join ROAR, buy the best batteries and motors available and fly to the nationals. That type of competition has its appeal, but to a very small percentage of R/C racers. I used to be one of them until I realized that racing is a lot more fun when kept small—the less commitment the better. A club or fun race where you're in and out quickly with lots of radio time, and things are casual, is a great preventative for burnout.

This is why I believe that parking-lot racing, or sedan racing, or whatever you call it, has become so popular. The idea of being able to erect a track on any stretch of unused tarmac is undeniably appealing. Some of the most entertaining "races" I've ever had happened on makeshift parking-lot tracks outlined with rock-filled cookie tins and plywood "Kaptain Knievel" ramps.

So when will I get back to my original point? Now is a good time. Everything we do is done to achieve some goal. Whether you do something from a sense of pride and achievement, to prove yourself against others, or to simply relax, there's a reason behind every action and decision you make. You go to work so that you can eat, you go to Disneyland to see Mickey and Goofy. Being a racer means that you have goals, too: to get better at racing and to prove your skill by competing against others.

To achieve your racing goals, some type of measurement standard is needed, and this is where a track comes in. A track, which can be any course that's repeatable, becomes the constant, the one thing that you can count on to remain the same. It's you and your skill that change as you become a better driver. Without a track, or other drivers, you have no idea if you are improving as a driver and mechanic (making your vehicle perform better is as satisfying as driving well).

This is why I condemn the industry's proclamation as false. Maybe as few as 10 percent of R/C enthusiasts race at permanent tracks with regularity, but I am certain that the vast majority consider themselves to be racers! Racing is racing, and whether you lay out a makeshift race course using bricks or pay ten dollars to race at a professional track, the goal is the same—to become a better RACER. ◆



For less than $100, we built our own neighborhood touring car track. Here's Doogie falling back on his considerable handyman skills as he resurfaces the pitted pavement.

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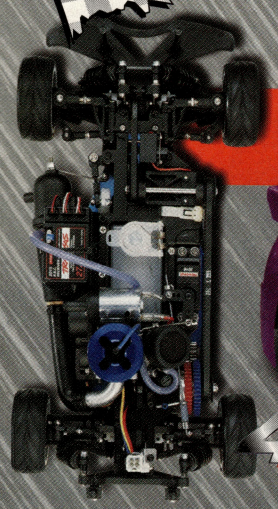



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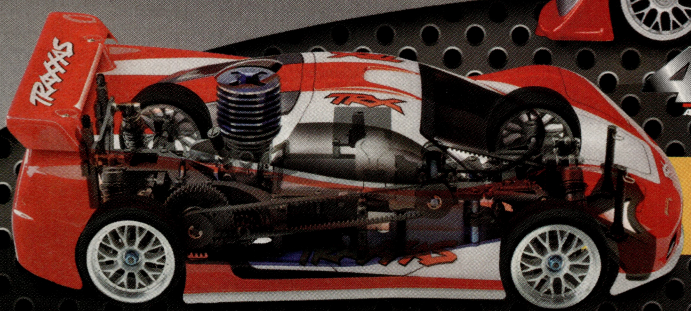

4-TEC ALL WHEEL DRIVE

- Efficient belt drive
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- Ultra Shocks
- 20-Turn modified motor
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PRO ZONE

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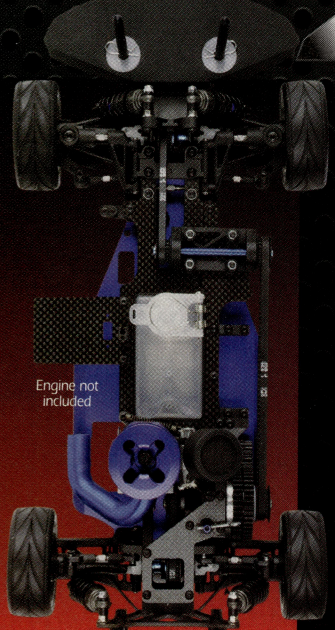

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- Pro ball differentials
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EVO-lutionary Schumacher

Try as it might, Schumacher has yet to establish itself in the highly competitive U.S. 2WD off-road market. Schumacher has hopes to change all this with the release of its newest 2WD racer, the Fireblade EVO. The EVO represents Schumacher's finest effort yet to build a car that can compete with the best from America on American tracks. Here are just a few of the new Fireblade's features.

New front spindles offer two holes in which to attach the steering rods, allowing you to adjust the car's Ackermann angle and tailor the steering response to your liking.

One of the most significant changes from the previous Fireblade model is that the EVO's steering servo has been relocated. Rather than being stood up and attached to the upper chassis, the EVO's servo has been placed flat on the lower chassis to lower the car's CG.

The chassis now has six battery slots instead of seven, so you can no longer move the battery's position back and forth as with the previous car. This most likely has to do with the re-positioning of the motor and its effect on weight distribution.

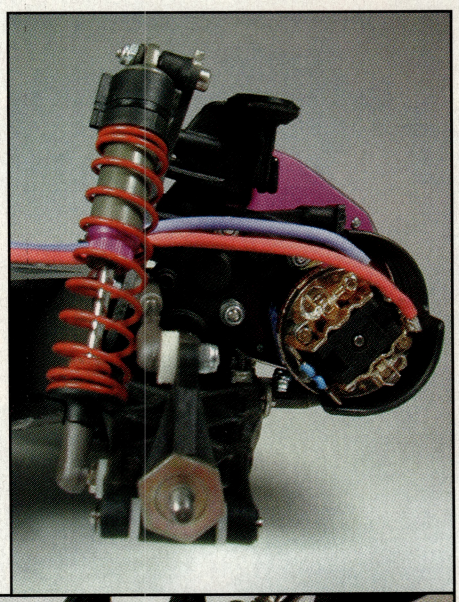
The EVO's rear shock tower has been tilted to match the angle of the rear suspension arms' movement. This ensures that there will be no binding of the shocks and suspension.

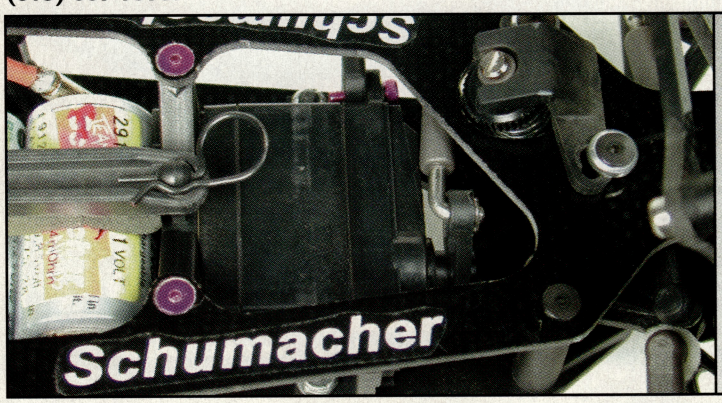
The Fireblade's three-gear transmission has been completely redesigned to be more "stood up." This allows the motor to be placed further inboard to reduce the amount of weight overhanging the car's rear axles.

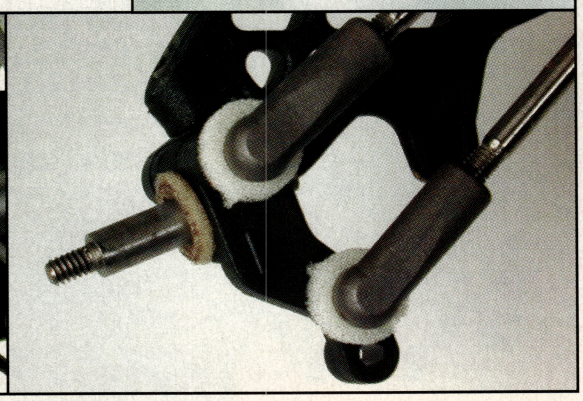
Schumacher has replaced its aluminum drive hexes with more rugged steel ones. The steel hexes, which are press-fit against the car's tapered rear axles, won't become worn like the aluminum hubs, which could cause binding of the rear axles.

For more information, contact Schumacher USA, Inc., 6302 Benjamin Rd., Suite 404, Tampa, FL 33634 • phone (813) 889-9691; fax (813) 889-9593.









Backwards is a Blast!

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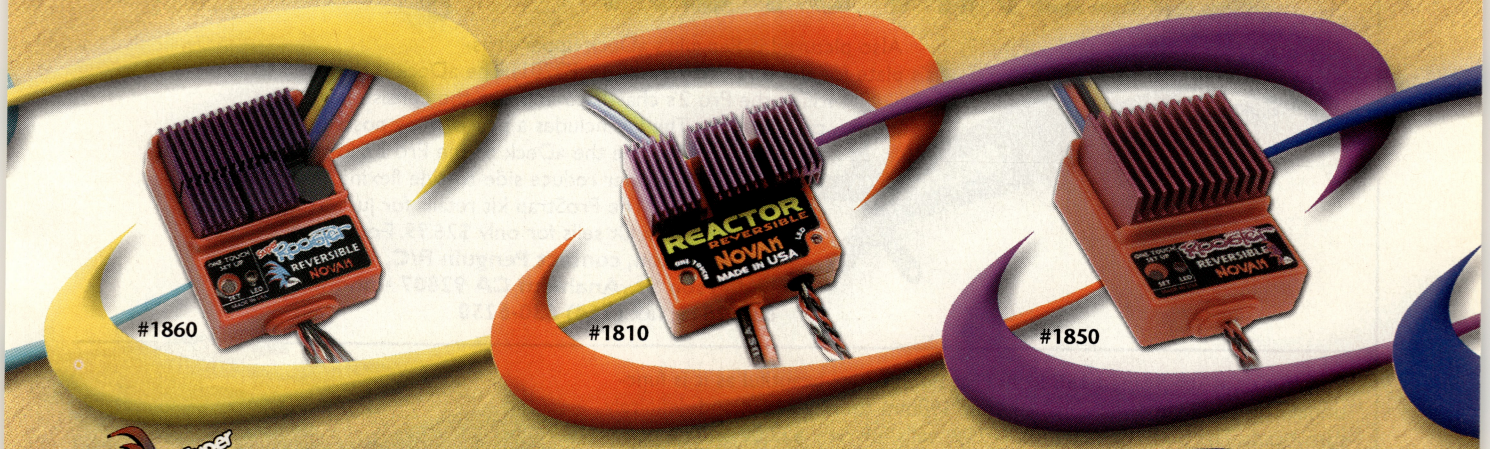
Novak Reversibles...

Forward or Reverse: We'll Keep You Headed in the Right Direction



Super Rooster Reversible Speed Control

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320 amps forward current
160 amps reverse & braking current
No Motor Limit
Dual-Level Thermal Overload Protection
Brake Light Circuitry

Perfect for Dual Motors

Reactor Reversible

6 & 7 cell operation
160 amps forward current
80 amps reverse & braking current
Thermal Overload Protection
Battery & motor connectors installed

Small Size, Powerful Punch

Rooster Reversible Speed Control

6 & 7 cell operation
100 amps forward current
100 amps reverse & braking current
Dual-Level Thermal Overload Protection
Brake Light Circuitry
Battery & motor connectors installed

Excellent Entry-level Choice

The Super Rooster, Reactor, and Rooster Reversible Speed Controls also come equipped with Smart Braking, Reverse Disable, One-Touch Set-Up, and Polar Drive Technology

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news flash!



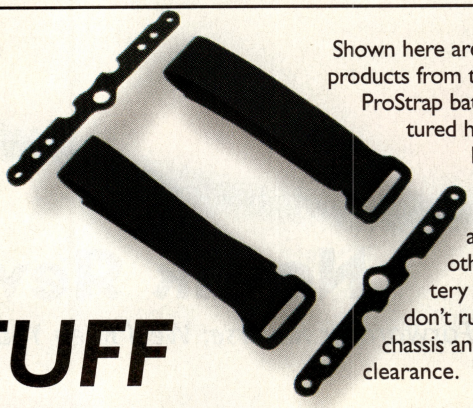
MEAN DEANS MACHINE!

Deans new Speed Series body for Associated's RC10GT. Recently on a trip to Deans (to swindle some battery bars and wire) we eyed this new body for the RC10GT nitro truck. Now that Deans have begun development on their Speed Series bodies, it was only a matter of time before they targeted Associated's best-selling vehicle.

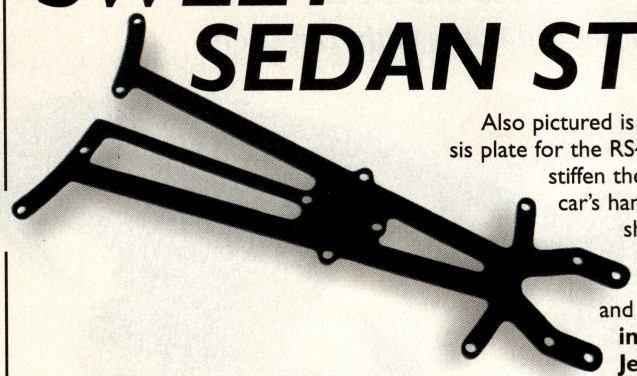
Projected to sell for $19.95, the Lexan shell emulates the popular Ford F-150 body type and has several interesting features including a rear spoiler with removeable tabs for additional downforce and easy track tuning, window masks for painting and stickers for detailing. See your local dealer and ask for part no. 3003 or have them contact their distributor. **For more information, contact Deans, 7628 Jackson St., Paramount, CA 90723 • phone (562) 634-9401; fax (562) 634-9403.**

SWEET SEDAN STUFF

Sedan racers are always on the lookout for cool new hop-ups for their rides, and Penguin R/C is happy to help you in your search. Penguin R/C is now producing a line of high-tech and very useful (and inexpensive) aftermarket products for most popular racing sedans, including parts for HPI's RS4 Pro 2 and Yokomo's awesome YR-4MTC (a full graphite chassis kit will soon be available from Penguin for this car).



Shown here are just two new products from the Penguin line. The ProStrap battery system (pictured here for the HPI RS4 Pro 2, part no. P3700) makes battery changes easier, and unlike most other Velcro-type battery straps, the ProStraps don't run underneath the chassis and reduce ground clearance.



Also pictured is Penguin's aDeck upper chassis plate for the RS4 Pro 2 (part no. P3701). The aDeck is designed to stiffen the Pro 2's chassis to improve the consistency of the car's handling. The kit includes a pair of alloy posts (not shown) that tie the aDeck to the Pro 2's lower chassis to further reduce side-to-side flexing.

The ProStrap kit retails for just $15.99, and the aDeck kit sells for only $26.99. **For more information, contact Penguin R/C, 1230-P N. Jefferson St., Anaheim CA 92807 • phone (714) 630-9015; fax (714) 630-6250**

A real hot body!

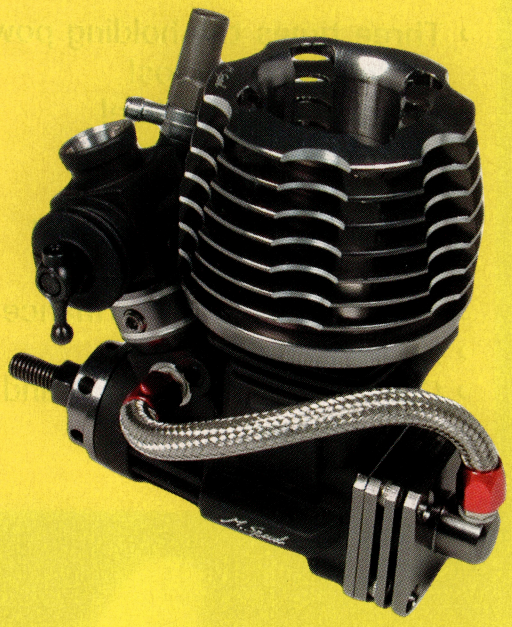
This hot new Alfa Romeo 156 from Hot Bodies is as beautiful as it is functional. The sleek lines will enhance your 190mm touring sedan and definitely turn heads. The body kit (part no. 10709) sells for only $22.00 and comes complete with pre-cut window masks to make painting a breeze. The version pictured here is decked out with Hot Bodies stunning decal sheet (part # 25709), which will also work on any sedan body from any manufacturer. **For more details, contact Hot Bodies, 308 Serrano Trail, Browns Mills, NJ 08015 • phone (609) 893-7716, fax (609) 893-2639**

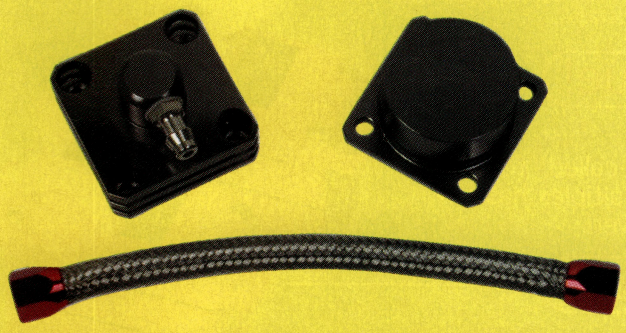


MATRIX MODS!

Integy has taken one of the most potent engines available for 1/10-scale racing—the O.S. Engines .12CV—and has made it even more powerful. Introducing the new Matrix Modified 12CV Team Edition engine, a highly modified O.S. that Integy believes is the fastest and most stable racing engine available for 1/10-scale.

The Team Edition engine features a full host of Matrix's M.Speed hop-ups, all of which are also available separately if you already own an O.S. .12CV. Here's a look at the new engine, which carries a retail price of $299.99. **For more information, contact Integy Technologies, Inc., 1140 Centre Dr. #E, City of Industry, CA 91789 • phone (909) 444-2766; fax (909) 627-4132**





The Matrix backplate assembly contains a boost-bottle chamber that increases low-end throttle response. The air chamber is connected to the engine case by a rubber air line covered by a super-trick braided stainless-steel hose with red-anodized coupler ends.



M.Speed's connecting-rod has been aerodynamically profiled to increase rpm. The rod rides on bronze bushings at both the crankshaft and piston ends for smoother operation and less wear.

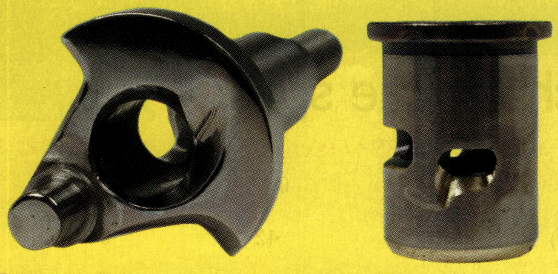


The two-piece M.Speed cylinder head comes with a special combustion "button" that allows the use of the larger Turbo glow plugs that are common in 1/8-scale on-road racing. The head is beautifully finished, and its two-piece design increases cooling and aids in combustion by providing a better fit to the combustion chamber.



The Matrix Team Edition engine comes with an O.S. slide-valve carb from the larger .15-size engine. A special adapter is provided that allows the slide carb to bolt right to the .12CV's engine case without modification. You can also remove the adapter to allow the use of a stock O.S. rotary carb.





Both the Turbo crankshaft and the cylinder lining have received extensive shaping, porting and polishing to improve the flow of the air/fuel mixture as it makes its way through the engine. These modifications require extensive hand labor, but the finished product is simply stunning. Arguably the highest-quality engine mods we've seen on a .12.

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Torque (in./oz.)	60	42	56	62	75	135	297
Holding Power (in./oz.)	180	165	126	186	225	405	891
Price	$60.11	$99.95	$99.95	$99.95	$99.95	$135.50	$159.95

* Profi 3BB is NOT digital or programmable
All mc/V2 servos listed have two ball bearings and metal gears
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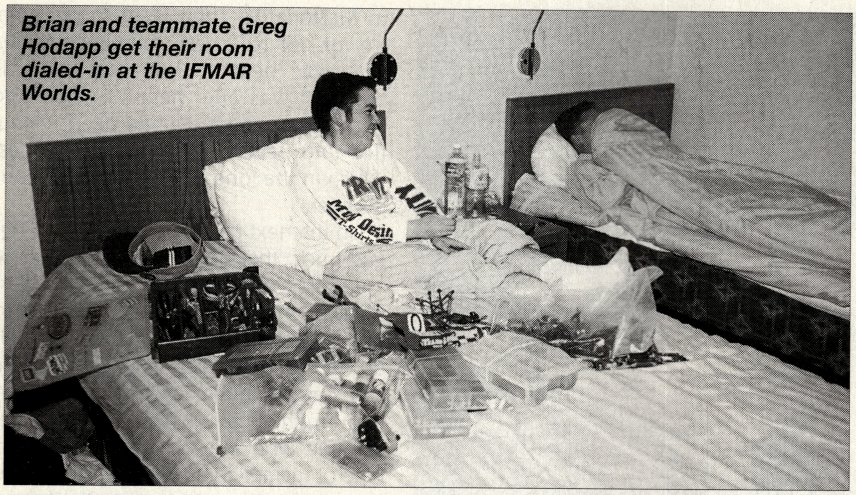
racers write

The Dirtinator Files by Brian Kinwald



Brian and teammate Greg Hodapp get their room dialed-in at the IFMAR Worlds.

We had a chance to sit down and talk with Brian after the IFMAR Worlds where he placed third in both the 2WD and 4WD races. Brian talked about how he liked the track, how his car worked, and the little bit of controversy surrounding the final 2WD A-main, particularly the much talked about trophy bottle incident.

R/C Car: So when did you leave for the race?

Brian: I left for the Worlds on Saturday at 1:00 p.m. from L.A. to San Francisco then on from there into Helsinki. It took me over 26 hours of travel from home to get here to the track. I've slept two hours every night. But it's not from jet lag or anything like that. I didn't have any trouble adjusting to the time. If you have a regular sleeping schedule then it might mess you up.

R/C Car: What did you think of the track?

Brian: It was good—a lot different than what we're used to.

R/C Car: So tell us about the Triple-X. How did it work for you?

Brian: The car worked good, but we still haven't had enough testing time with it to get it completely dialed-in yet. We're getting there, though. Every track you go to is completely different, and we just don't have the experience that we need with the car yet. But like I said, we're getting there. We got faster with the car as the qualifying rounds went on.

R/C Car: How did your 4WD car work?

Brian: It was really good—dialed from the start. I didn't even need to touch it, really. After two rounds of qualifying, though, something happened to my car and I didn't know what it was. I rebuilt the car and it was fine after that.

R/C Car: How did the new tires work—you used the new Yellow compound, didn't you?

Brian: Yeah, I used the new tires—they worked good...almost too good. They gave the car a lot of traction. It also depended on what part of the day you used them. Towards the end of the day they had too much traction, and when that happened I would switch to Red compound tires to get less rear bite.



Brian made a "one-off" set of rear tires for his XX-4 for the IFMAR Worlds. The tires featured the center section of the tire reversed inside-out. It freaked out a lot of racers!

R/C Car: So, everyone's been talking about what happened in the 2WD race—especially what happened at the trophy presentation between you and Mark.

Brian: I'd like to start this by saying that Mark and I have been good friends for about ten years and I thought we had kind of an understanding on the track. If it had been anyone else, it probably would not have bothered me so much, but when a good friend does that, it hurts. I don't want to go into detail about what happened, but let's just say that I had a really good chance of winning.

The thing about R/C cars is that when there is a crash, "you" don't get hurt, and people drive knowing that. But if everyone does that, it's not going to be R/C racing. I know I'm not perfect—I hit people all the time, but not on purpose, even if it means winning a World Championship.

The whole thing with the Champagne bottle was that I am kind of allergic to alcohol. If it just gets on my arm, I'll be sick in minutes. I asked not to get sprayed and both of them unloaded on me, soaking me head to toe. I saw Mark's car balancing on his trophy and tried to knock it off, not thinking it would be a big deal, figuring he's done a lot worse to me, but I guess not—sorry!

I left right away not because I was mad, but because I had to wash off the Champagne before I got sick, so I think people thought I was really mad at Mark.

I know there is a lot of pressure at the Worlds and people put a lot of pressure to do things you don't want to, but as good a driver as we are, we can't let it get to us. I just want to say I am not mad at Mark—I am just bummed out, and I hope that everything is cool now that the race is over.

R/C Car: What are you going to do when you get back home?

Brian: I'm going to sleep a bit then head on down to MnM to do some testing with the new car. After that I'm heading off to Ripon, California to race the ROAR On-Road Nationals. I'm looking forward to racing 1/12 scale on that track—it's going to be dialed! Also, I'd like to thank some people for all their help at the Worlds—Ernie Provetti, Gil Losi Jr., Jim Dieter, Dave Spashett, Pops, Randy Poh, Jason Corl, Chad Phillips, James Capelle, Nancy Capelle, Tyree Phillips, and a special thanks to Matt Francis. ◆

racers write

by Richard Saxton



Recently I had to get prepared to go to two races back to back—first the Detroit gas race and then the IFMAR Worlds in Rauma, Finland. I left on a red-eye flight Wenesday going to Detroit only a few days before the IFMAR Worlds in Finland were about to kick off, so I had to pack for both. I got to Michigan at 5:00 a.m., met my mechanic Regan, got my rental van and then left for the hotel.

Regan had all my practice stuff ready, so with one eye open I headed to the track. I started practicing with my practice cars and I felt like I was going good. Friday rolled around and we had a half day of practice and one round of qualifying, so I had my race stuff ready for that. After the first round I was sitting fourth in truck, and in 1/8 scale I blew out—I crashed a bunch. It wasn't too good of a day, but no big deal. Regan's cousin Jodie and her husband came out and threw a barbecue for us, and all the Kyosho, Mugen, Associated, and Losi guys all got together—it was a really good time.

There were three rounds on Saturday and I TQ'd the first round that day with my gas truck then apparently they re-shuffled the order of the heats. I was in the middle of the group, so I still stuck with the same heat. So after I ran my gas truck in the first round, I ran out to McDonald's, then went to get some ice for our ice chest, thinking my next race was heat 17 with my 1/8-scale buggy. It was after heat 13 when I got back and found out I had been re-shuffled into heat 11, so I missed my heat, which in the long run turned out to be a disaster.

In the next round I went out and TQ'd gas truck, then in the next qualifier for 1/8 scale, I broke a shock tower, then the skies opened up and it started pouring rain, so we went back to the hotel to build up two 1/8-scale cars and get ready for race day and a full day of trying to bump up from the I-main where I had qualified. For you who are not familiar with this type of racing, if you win your main, they let you race the next one up. So the winner of the D-main goes into the C, then the winner of that goes into the B, and so on...

I bumped up from the 10-minute I-main and then I started bumping up through the other mains. I had a bunch of practice tires left over, so I used most of those, and I had a bunch of receiver packs charged and ready to go. I bumped up from the I-main all the way up to the B-main—between heats I only had a few little pieces that needed to be replaced. I was running fourth in the B and I went off a jump and a plastic piece broke on the upper mount that holds the caster block—that was it. It was a good try, but it wasn't too fun walking off the drivers' stand not making the A-main when I knew my car was one of the best there.

I've had the good luck this year with Mark having his bad luck, so I guess you have to take the good with the bad! So we waited around for the 45-minute gas truck A-main—it was the last race of the day and we were pressed for time. (We had a flight at 9:54 p.m. from Detroit into Amsterdam.) We started the A-main around six and it ended at 6:45 so that was pretty good. I had a good race with Jason Ashton and the other Jason from Detroit. They both ran really good. I won the race by a lap and a half—I ran off the drivers' stand, Regan grabbed the trophy and we headed to the hotel, grabbed a shower, gave my gas stuff to Thunder Tiger and headed out to fly to Amsterdam, then off to Helsinki, Finland, for the Worlds. I have a ton of stuff to tell you all about the Worlds, but I'll save that for next time—I will say that Finland was a good time. Stay tuned 'til next month's Sac-files! ◆

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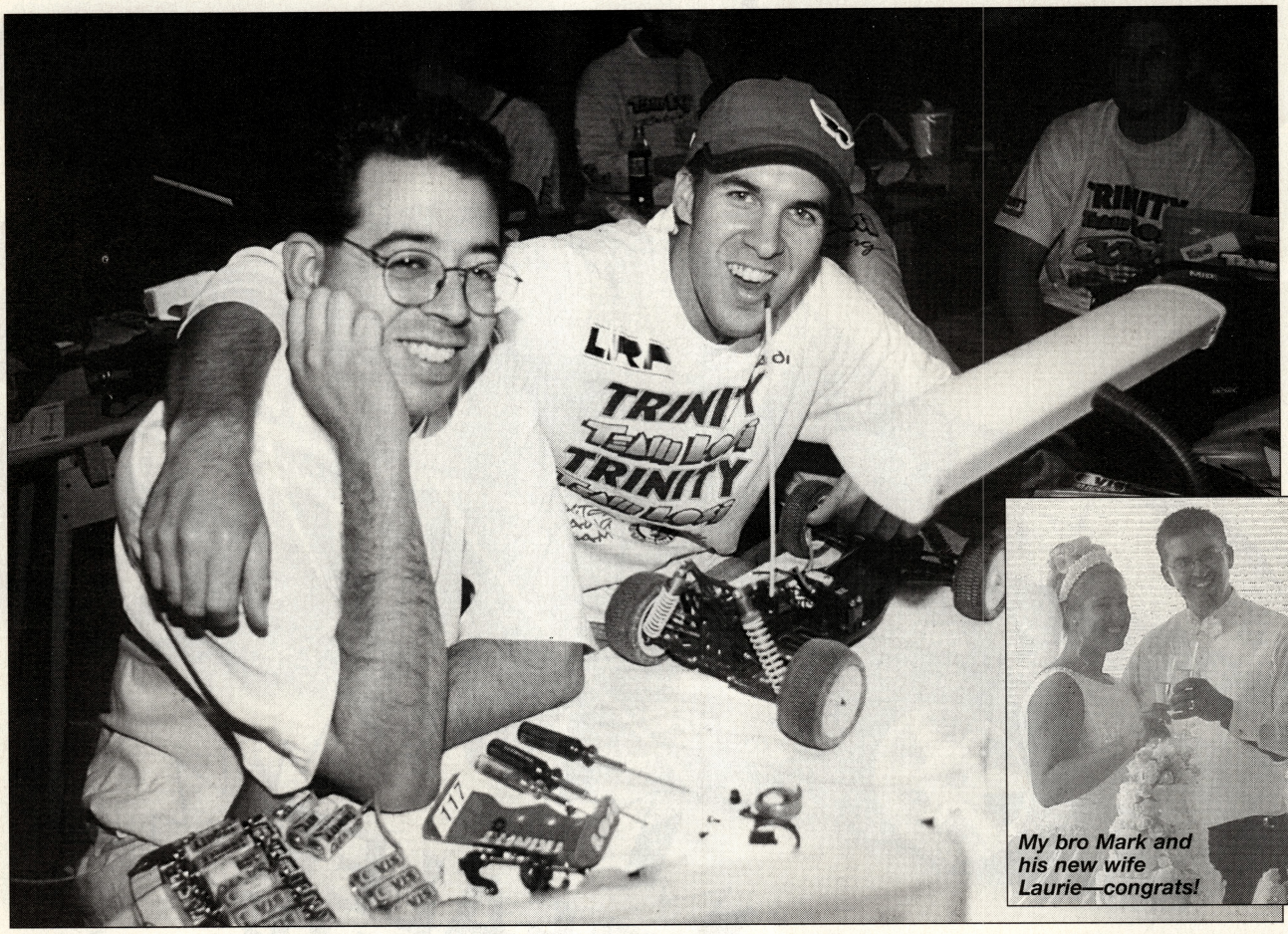
racers write

by Matt Francis



My bro Mark and his new wife Laurie—congrats!

There are a few people in our hobby who always seem to go unnoticed. Take, for example, the guy in the picture with me. Does anyone know him? Well, that's Richard Trujillo, team manager for Team Losi. Those of you who raced stock sedan at the Reedy Race in May surely know him—he kicked everyone's butt! Although I was not there, I did hear from the Dirtinator that Richard put on a driving clinic during his A-main win. I would like to dedicate this month's column to Richard. Judo Chop!!!!

Now that I have that out of the way, let's get on to business. Just a few hours ago I got home from the IFMAR World Championships in Rauma, Finland. I am not going to get into full details, because it makes me bitter to talk about it, but I will do a brief synopsis of the event. I will start with 4WD. Jukka won and deserved it. There were a couple people that had a chance, but not a great one. Jimmy Jacobson probably had the best chance; he led one of the mains up until the last lap. He deserved second. So this left third through tenth open for the rest of us. I will leave the results unmentioned, because I'm not happy with them. Now for 2WD...well...that's enough of that.

The week before we left for Finland my brother Mark did the deed—he got hitched to his longtime girlfriend Laurie. The wedding was great—it took place at a country club just outside of Sacramento. I am glad to say we didn't need the cleanup services of Richard Saxton at the wedding (that's an inside joke for those of you who were at Mark Pavidis' wedding). After the wedding Mark and Laurie headed off to Lake Tahoe for the weekend. They had to cut the honeymoon short, but are planning a full honeymoon later in the year. Congratulations, Mark and Laurie!

Three weeks prior to that I ran the ROAR Off-Road Nationals at MnM Hobbies in Corona, California. This race was much better. I finished second behind Dirt in 2WD and third in truck. This was also the debut of Team Losi's new Triple-X buggy. Let's talk about this new car a bit. First off, this car is dialed! We are still finding all the perfect setups for each track, but I can guarantee this car will be fast everywhere we race it. Here are the main differences in the car: more steering, more stability, much better jumping characteristics, it's easier to work on, has a Formula 1-looking design, and best of all, it has the ability to out-accelerate any car! Look for it September 3rd!

Well that's about all I have to say this month. I would like to say congratulations to Jukka and Masami on their World Championship wins! L8R. ◆

XXX

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2	Matt Francis	XXX	Silver Wide Body	Silver Taper Pin	Trinity
3	Billy Easton	B3	Silver Wide Body	Silver Taper Pin	Reedy
4	Chad Phillips	XXX	Silver Wide Body	Silver Taper Pin	Trinity
5	Greg Hodapp	XXX	Silver Wide Body	Silver Taper Pin	Trinity
6	Rick Hohwart	XXX	Silver Wide Body	Silver Taper Pin	Peak
7	Todd Hodge	XXX	Silver Wide Body	Silver Taper Pin	GM
8	Travis Amezcua	XXX	Silver Wide Body	Silver Taper Pin	Orion
9	Jason Corl	XXX	Silver Wide Body	Silver Taper Pin	Trinity
10	Mark Francis	XXX	Silver Wide Body	Silver Taper Pin	Trinity

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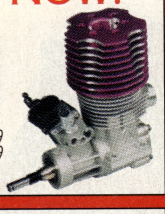

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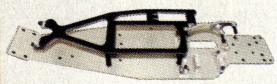

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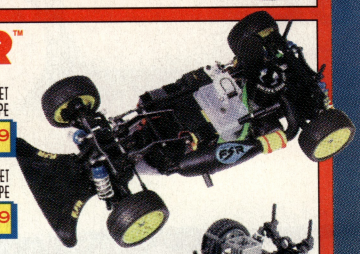

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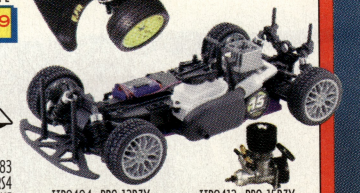

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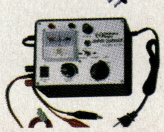

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racers write

by Mark Pavidis



We caught up with Mark after the 2WD IFMAR World Championship and asked him a few questions about the race, his expectations, and upcoming fatherhood.

R/C Car: So tell us about your trip over here to the Worlds.

Mark: Well, I left out of LAX at 3:00 in the afternoon on Thursday, got into Helsinki at 6:00 or so and then it was a four hour drive to the hotel. We finally got settled into the hotel here Friday night around midnight—almost 24 hours of traveling.

R/C Car: So what do you think of Finland so far?

Mark: It's really nice here—it kind of reminds me of Washington state. There are a lot of trees, and it's really nice and scenic.

R/C Car: What's your opinion on the four racers here from Finland—they've done very well.

Mark: I think it's pretty cool. I can't believe a privateer made it into the 2WD A-main final. I think the "hometown" crowd and the spirit behind it really gives you a little bit more to shoot for.

R/C Car: This may sound like a stupid question, but just how disappointed are you with not winning the 2WD portion after being so dominant in qualifying?

Mark: I'm not disappointed. I think I did the best I could do. Everyone comes here to win—it was on my mind. I am kind of surprised that I did as well as I did in 4WD. I didn't think that the car I had was superior to what everyone else had. Going into 2WD I was racing on a surface that was something close to what I raced on at home so I thought I could do pretty well. I think in the mains it was just a matter of nerves.

R/C Car: So do you want to talk about what everyone is calling the controversial "take-out" move?

Mark: People can call it what they want, but the shoe has been on the other foot. I can remember several times in the past that it's been the other way around, but I'm not going to say I have videotape or anything like that to make the point that incidents like that do occur. Racers provide results for their team, and for themselves. The thing with Brian, unfortunately, Brian had a win, I had a second, and you knew that I had to give it all I had. Off the line my car wasn't very good and that hurt me in all the mains.

R/C Car: That's another thing we heard about—you didn't get to choose your spot on the grid, either to the inside or outside.

Mark: Yeah, and I don't know what really happened there. I heard that they asked the TQ [Jukka] in 4WD where he would like to line up. I just assumed that that was the grid for the rest of the race. No official came up to me and asked me if that is where I would like to start. I would have definitely chosen the other side. In each of the mains not only did I have to accelerate as hard as I could off the line, but I also had to protect the inside line as well. All that work in qualifying pretty much meant nothing at the end of the week except for a plaque.... I think that IFMAR and most other sanctioning bodies need to put more emphasis on the importance of qualifying.

R/C Car: Trophy presentation?

Mark: Yeah, that seems to be all that everyone is talking about right now.... I knew the tension was high between Brian and me—it's always that way when we race together. We're the two that are always going at it and Brian has been my friend for a longtime and vice-versa and he's gotta understand, for the same reason that he would, that we're here to win. Associated spends a lot of money, Trinity spends a lot of money, Team Losi spends a lot of money, and so on. Anyway, everyone is getting their trophies and we break out the Champagne and I blasted Masami, then Brian, and Masami took Brian's hat off and soaked him. Then Brian takes his bottle and tosses it at my car and trophy in front of the entire R/C industry. Luckily it didn't knock it over or break it. He just said "it slipped".... It's a bad thing, but hopefully he and I can get past this.

R/C Car: So what's next after this race?

Mark: I'm gonna get on a plane for 20 hours and head out to go be with my pregnant wife who's due pretty soon!

R/C Car: So are you nervous?

Mark: I'd be lying if I said I wasn't...I thought I was nervous for the third and final main today for the World Championship, but this is forever going to be a World Championship for me after my daughter is born.

R/C Car: Thanks Mark, is there anyone you'd like to thank?

Mark: I'd like to thank all my sponsors—Team Associated, Yokomo, Reedy Modifieds, Pro-Line, LRP, Airtronics, MIP, Thunder Paints, Mechanix Wear, Kimbrough, Oakley, Ceet, and Doug Dubach's Used Bikes.◆

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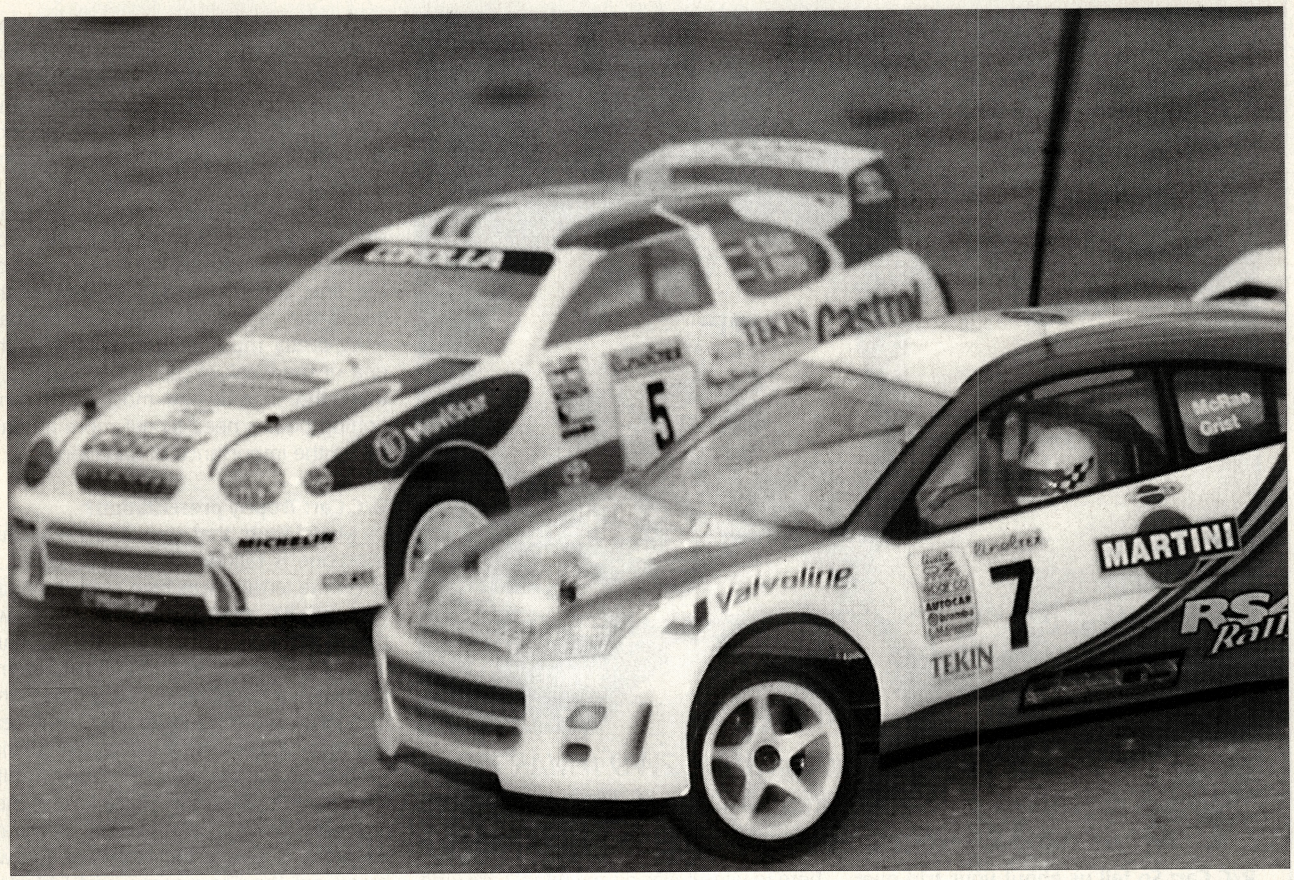

Rally Fan

I was *elated* to see the "Rally Car Shootout" in the September issue of *R/C Car* I just got yesterday! I'm really interested in this new trend of cars, and I think I'm about to buy one. I was, however, disappointed that you guys didn't include the Streetwise Ford Escort Rally Car from Tenth Technology in the shootout. It sounds (from what I've heard on the internet and through Tower Hobbies) like a competent performer both on road and off. I understand there are three different Streetwise kits that are basically the same, but with different bodies, tires, and suspension setups for on-road (Mercedes body), off-road (Ford stadium truck), and rally (Ford Escort) racing styles.

I'm really interested in the stadium truck version. I read the *R/C Car* review of it in the August 1998 issue, and it looks like a really radical design. I'm sure the few flaws it has can be ironed out with the extensive hop-ups available through Tower Hobbies and Tenth Tech.

How would the Stadium Truck or the Rally car compete with the other four Rally Cars you reviewed? The Tower Hobbies description of the truck warns that, due to its relatively short suspension travel, it should not be driven on extremely rough courses. This sounds more like a rally car than a stadium truck to me. And I read that the Streetwise off-road kits are basically converted touring designs.

My theory is that the stadium truck is a good rally car. The only problem is that I don't have the car to test it out. By the way, Tower Hobbies has it on sale for $120, knocked down from $200. And that's with full bearings, ball diffs, and a motor! What do you think? Can it compete?

Thanks a lot for your help! I'm looking forward to your response!

Jesse Hofmann-Smith

Portland, OR

PS: I love the magazine. Unlike this "other" R/C car mag I subscribe to, you guys aren't afraid to criticize manufacturers when their products need improvement (or even redesigning :-)) Keep up the great work.

The omission of the Tenth Technology Streetwise Rally was, in fact, a glaring one. That's right, we goofed! At the time of the shootout, we were unaware that there was a rally version of the Streetwise offered (in other words, we had forgotten!), otherwise, we would have included it in the shootout. As far as the capabilities of the Tenth Tech, we believe that it would have done quite well, possibly even displacing the Schumacher for the third position (this is based on our experience with the stadium truck version).

Tower Hobbies is correct in its assessment of the Tenth Tech's abilities. We wouldn't recommend it for use on off-road tracks with big jumps, but it will most definitely hold its own on nearly any "natural terrain" you can find.

Taking R/C global

I always have to start off by saying kudos to the staff for another beautiful issue. The most wonderful part of the issue was the Reedy Touring Car Race coverage. This is what I love to see on race articles. Lots of color photos, and talk about not only the race but the atmosphere at the race. It was well put together and had lots of gorgeous pics of the track and the cars. It was like being there but without the lost luggage and bad airplane food.

Have any of the R/C industry leaders ever contacted places like ESPN to get a nationally televised race? Us racers and hobbyists write them constantly, but we

don't have one tenth the influence that a magazine or manufacturer would. Couldn't you send them a couple of back issues to show them what racing R/C is all about? After all, the Japanese companies like Pioneer seem to understand that it is a very interesting sport. What if you guys got together with a manufacturer to express how big this venue could be for their company. (Maybe also point out that they televise the championship "magic" tournament and the world chess league tourney, or maybe the championship poker contest.) How many sports are out there where a "little" guy is allowed to sign on and compete with sponsored factory team racers? Not in NASCAR, NFL, NHL, MLB, or any other sport on the Earth. I think that televised races would give this hobby/sport the kick in the tail it needs to stay alive.

This is for every sponsored racer: When we see pictures of Masami Hirosaka he's always smiling and people say great things about him and his team. He never has anything negative to say about his car or his team. He has been a pillar of positive news for R/C. Now, when we talk to the big American drivers, they are always saying "well my car broke", or "my radio glitched", or "somebody turned on their radio", or even "some kid rear-ended me and I couldn't win." This puts a negative spin to the sport. Blame it on your equipment—it can't be your fault is what they are saying to the public. So what if someone else caused your downfall, tell it to your sponsors, don't whine to everyone else or you'll look like a crybaby and give us all a bad name.

I'm trying to get the point across that any driver who gets paid to drive is living a dream many of us will never achieve. They need to look at their station in life and realize that they are on borrowed time. Someone will always be better, or faster and willing to knock you off your high horse at the slightest chance. You won't be the fastest forever. Appreciate the gift you have been given and treat every race like a huge billboard to the world as to what this sport is all about. Leave the whining to the kids and put a smile on your face. Act happy when you're not because all eyes are on you, and you represent me and everyone else in the sport. When you watch a NASCAR race no one thinks about DuPont, they think about Gordon; no one thinks about Lite, they think about Wallace. They represent NASCAR just as you represent R/C. It's time you act like it all the time, not just when you're winning. If this hobby/sport is to live in the coming millennium we need to change some of the old ways or we'll all see R/C go the way of slot cars. Remember those? Do you? They used to be the biggest thing. Where are slot cars now? They failed to change with the times. Thanks for letting me get that off my chest.

Chris M. Filtz
[via online]

Too lean or too rich

I purchased a Force .15 Pull start engine with my Ofna Z10 Nitro Team Kit. I am having problems setting the low end needle properly. The factory setting is flush. When I pull the throttle from the start line, it bogs down and then goes. The instruction I have says to lean the low end needle to correct this. I have leaned the low end needle and it still bogs. Is there any thing else that I can do to get the engine to run correctly. Also, how can I find out the exact setting for this needle (not just flush), because the company says flush, but some of us don't have the eye to see it exactly flush. Please help soon, I want to race this weekend.

Kenny Vaughan
via online

Kenny, the instructions are right—leaning the low-end needle should increase the throttle response from low rpm. However, if this isn't doing the trick, then it's possible that your low-end needle is actually too lean, and the engine is starving for fuel at low rpm, hence the hesitation. There should always be a puff of blue smoke from the exhaust when the car takes off from either a full stop or from low speed. If not, it's too lean. We recommend that you first make sure that the high-speed needle is set right, i.e., the engine has good top speed and pushes blue smoke, but without getting too hot. If you have a temp gauge, check the cylinder head to see if the engine is running cool enough—it should be around 200-210 degrees on an infra-red probe. MIP's gauge runs a little different. You can do the old "spit test" by putting put some saliva on the head and count the seconds until it boils away. It should take about three seconds. If the spit sizzles away right off, the engine's too hot. If the high-speed needle is good (good speed and temp.), you should be able to fine-tune the low-end needle to get the punch you want. Sometimes, some engines can have a low-end needle that can't be leaned enough—we've

TEAM LOSI TECH-TALK

Repeatable Shock Fluid

Have you ever bought a new bottle of shock fluid to replace an empty bottle in your tool box, only to find that when you use the new bottle the fluid is a different viscosity than the bottle you replaced? Well, this problem has been solved with Team Losi's new Certified Shock Fluid. The new Certified fluid replaces Team Losi's original line of Silatech fluid. Aside from being certified for consistency, the new line of fluid has been expanded to include 45, 60, 70, 90, and 100 weight fluids, previously unavailable.

What's special about this fluid, you ask. First off, the Certified Shock Fluid is guaranteed to be within 2% of the viscosity that is marked on the package. This is true regardless if when or where the fluid is purchased. So, if you run out of fluid two years from now and buy a new bottle, it will be the same as what you had been using. The Team Losi Certified line of shock fluid is the only line that can claim this consistency. In fact, even the laboratory where some of the common viscosity fluids are mixed only guarantees the fluid to be within 5%. Team Losi is correcting these and all other fluids before shipping them to you.

The testing is performed on a computer-controlled viscometer in a controlled environment. Once the target viscosity is achieved, the fluid is packaged and sent to the hobby shops.

Speaking of packaging, the Certified Shock Fluid also has the viscosity stamped on the lid of each bottle for quick identification when the bottles are packed in your tool box. As before, Team Losi shock fluid has an easy-to-use flip top for clean and simple dispensing.

Clean Pivot Points

If you've ever run your car or truck on a dusty track, you know that the suspension arms and pivots can become sticky and stop moving freely. There is an easy way to clean these parts quickly and return the suspension to a free-moving state.

Disassemble the suspension and remove the hinge pins from the suspension arms. Clean the hinge pins with a crocus cloth or ultra-fine steel wool to remove any corrosion. Next, use a small pipe cleaner to remove any dirt from the inside of the holes in the suspension arms. Pipe cleaners can be found at most stores where tobacco products are sold. We have found the pipe cleaners with different colored, stiff bristles scattered throughout to work the best.

Once all of the hinge pins and suspension arms have been cleaned, reassemble the suspension. You should find that the suspension moves much more freely now.

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seen it happen. In which case you may need a new carb or needle. But like we said, this is very rare. Hope this gets you running.

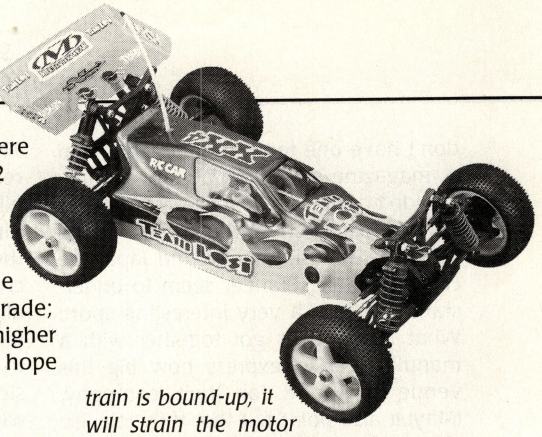
P.S. The "factory" settings are always just starting points. There's no substitute for a keen ear and eye! You can go nuts counting needle turns and still have a lame engine!

Meltdown

Hi, I've recently become interested in RC cars again after several years away from the hobby. I'm currently running a Losi XX4 and am having problems getting my electrics to stay attached to the motor. The problem seems to be that the solder is melting from the heat and the capacitors and motor leads therefore have a tendency to fall off on the jumps. At first I thought I had just made a bad joint, but then I noticed a couple small drops of solder under the motor on the car's chassis. I know the XX4 is supposed to run hot, so I do have a heatsink mounted and the Losi HW body, though it's still a comfortable 75 degrees here by the beaches in Southern California. Anyhow, here are the electrics I have installed: 12 turn D3 w/18 tooth pinion, Novak cyclone ESC and a Trinity Sport Tech 2000 battery pack all connected with 13-gauge wire. The solder I'm using is a 40/60 grade; should I opt for one that has a higher silver content to lead ratio? Well, hope you guys can help, thanks!

Kane Yanagawa
[via online]

There are two possible problems here, Kane. The first is that you aren't allowing the motor and speed control to cool adequately between runs. If you are running consecutive battery packs without letting the electronics and motor cool to ambient temperature (the temperature of the air around you), you can overheat the motor and speed control, which could cause the solder to melt from the motor. The other possible cause of your problem could be drive train friction. Remove the motor and spin the car's wheels—they should spin relatively freely without much binding. If your car's drive-



train is bound-up, it will strain the motor and cause it to overheat. A binding drive-train is one that's in need of a complete rebuild, including a thorough check of all the ball bearings. Otherwise, your XX4 should run fine with the motor, battery and speed control you've chosen. ◆

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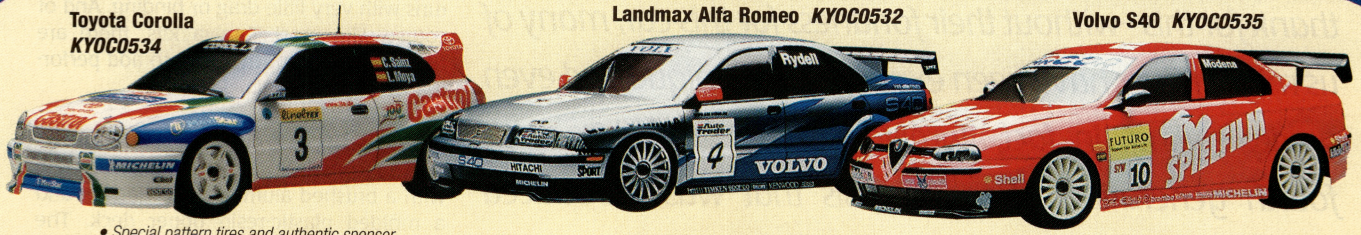

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The Mini, whether badged as an Austin, Morris, or Rover, has amassed quite a cult following in its 40-year history. Surprisingly, American R/C car enthusiasts have embraced the Mini as well, even though they are almost never seen tooling around streets on this side of the Atlantic. It is generally agreed that we have Tamiya to thank for this—without their fondness for this car, many of us might never have been exposed to its unique and even quirky styling. In fact, Tamiya is now producing their fourth generation of the chassis that was introduced specifically as a 1:10-scale platform for the Mini.

Well, Tamiya's fondness for this beloved car hasn't waned any, as now they are offering the Rover Mini Cooper Racing in 1/8-scale, on top of the nitro-powered TG-10 platform. Yes, we know that the TG-10 is a 1/10-scale chassis, but in case you didn't know, the full-size Mini is a pretty small car (hence the name). The TG-10 wheelbase with oversized tires and wheels puts it in proper proportion for Tamiya's endeavor.

The TG-10 platform represents Tamiya's most recent foray into the world of 4WD nitro-powered cars. They designed a layout that is easy to build, easy to maintain, and runs with very little drag or binding. And of course, like most Tamiya kits, there are numerous hop-ups available to add performance or individuality to the car.

Chassis layout & drivetrain

The chassis is a double-deck design, with a brushed aluminum lower deck and a molded plastic-resin upper deck. The two join at the front and rear bulkheads to

Tamiya Rover Mini Cooper Racing

The Mini goes big!

By Lito Reyes



make a stiff structure that isn't very prone to flexing. Running down the centerline of the chassis is a hardened-steel propeller shaft that links the front and rear gearboxes. The shaft mounts to joints on either end that are supported by long-wearing bronze bushings. Each propeller joint mates to a bevel gear that transfers the power 90-degrees to a sturdy gear differential. The steel outdrives of the differentials are supported by ball bearing; these four are the only ones included in the kit. Power from the outdrives is transferred to steel dogbones on all four corners. The dogbones drive steel axles that each ride on a pair of bronze bushings. If the description of this chassis sounds familiar, that's probably because the TG-10 platform is essentially a scaled-down version of the TGX chassis that Tamiya has offered for a few years. The design is very functional and durable, so the transition to a smaller, less demanding scale was a good choice.

Suspension

All four corners feature strong two-piece molded nylon lower arms. Upper links are all adjustable steel tie-rods. Each arm gets a plastic oil-damped coil-over shock absorber. There are no options for shock mounting location for either the upper end or the lower end, and the shock piston is built into the shock shaft, so tuning is limited. The Mini kit does come with heavyweight silicone oil for damping and different rate springs for the front and rear ends, though.

Power to the drivetrain

The powerplant that comes with the Mini is Tamiya's venerable FS-12LT nitro engine. This recoil pullstart-equipped glow engine is designed with a cast heatsink head and a single-needle carburetor for easy tuning. An airplane-style muffler is included, along with some exhaust tubing to route the expelled smoke and oil away from the chassis and out below the rear bumper. A two-shoe clutch assembly turns a 15-tooth bushing supported clutchbell that powers a large spur gear keyed to rear propeller shaft. Also keyed to the spur gear assembly is a fiber brake disk. When compressed by a pair of steel brake shoes, the brake disk gives plenty of stopping power for the Mini.

Electronics

The component layout of the TG-10 chassis is very well organized. On the left side of the car, the engine is bolted to the lower chassis plate and the 65cc fuel tank is suspended from the upper deck (in front of the engine). On the right side, the steering and throttle/brake servos, receiver, and battery pack all get mounted to the upper chassis. The look of the assembled and ready-to-run chassis is very clean, with all components tucked neatly into their spaces. This design also facilitates cleaning and maintenance. To remove the upper deck and all the attached components you only have to remove the servo horn from the throttle/brake servo, pop off a ball link from the steering servo, disconnect the fuel lines from the tank, and remove eight screws from the front and rear bulkheads. The whole drivetrain is now accessible.

Other details

As is becoming the standard these days, this Mini kit is very complete. Tamiya has even included a urethane front bumper to protect the chassis and an air filter for the carburetor. But the best parts of this kit are the body and wheels. As usual, Tamiya has produced a beautiful scale replica of an automobile. Using a multi-part mold, just about every crease and fold of the Mini's body panels are replicated accurately in 1/8-scale. The

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HS-605MG		91oz.	.13 sec.	Dual BB	1.6"x0.8"x1.5"	2.12oz.		X	X	X	X	
HS-615MG	Ultra Torque	132oz.	.18 sec.	Dual BB	1.6"x0.8"x1.5"	2.12oz.				X	X	X
HS-925MG	High Speed Coreless	103oz.	.08 sec.	Dual BB	1.5"x0.8"x1.5"	2.04oz.		X	X	X	X	X
HS-945MG	Ultra Torque Coreless	153oz.	.12 sec.	Dual BB	1.5"x0.8"x1.5"	2.04oz.		X	X	X	X	X

MG=Metal Gear. Note: All Hitec metal gear servos use aluminum output shaft. 6V rating used for use with ESC. If using 5 cell Rx pack add 12%.

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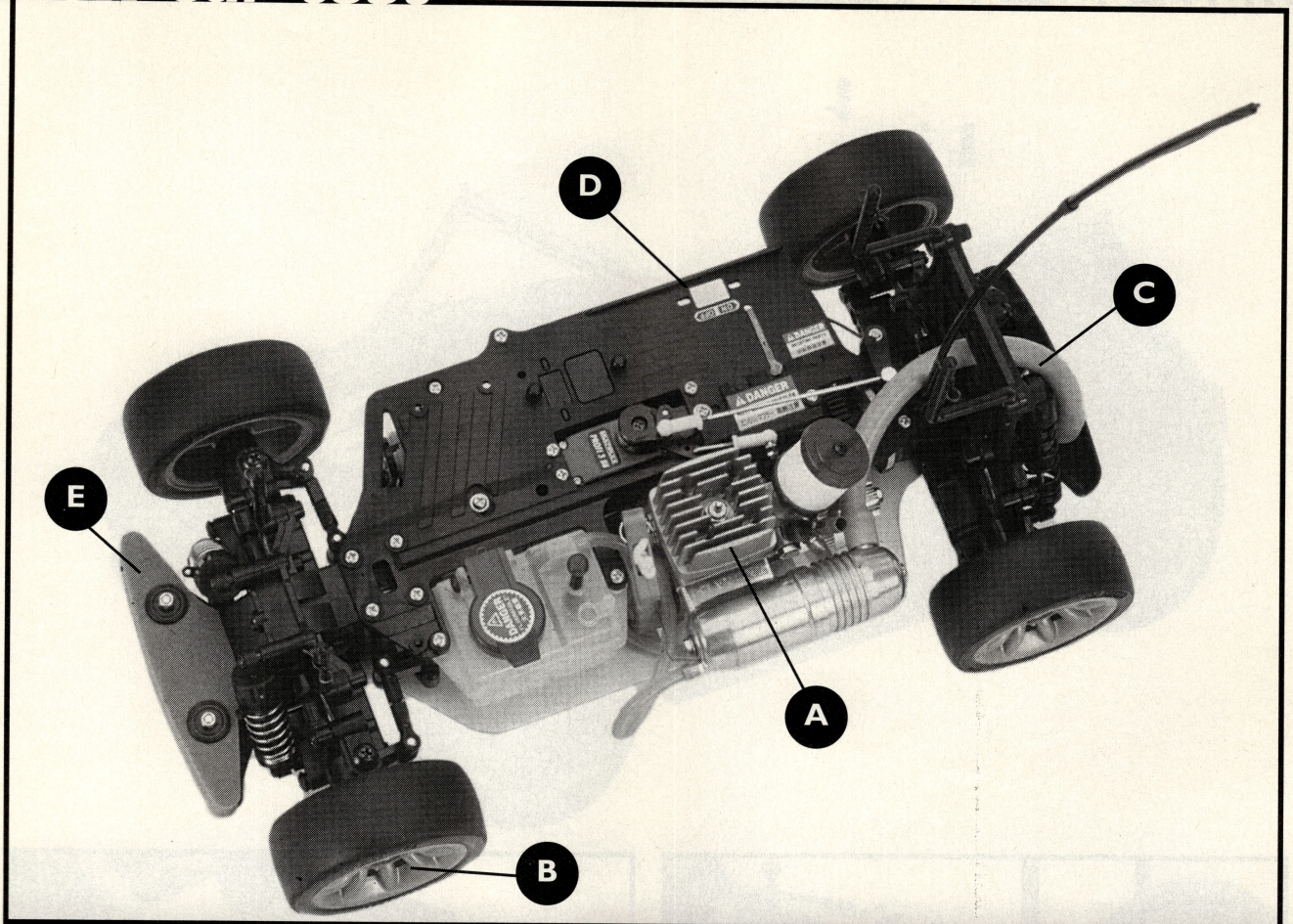


A: Tamiya's FS-12LT pull-start engine is included in the Mini Cooper kit. A good, reliable powerplant if not a stellar performer.

B: Large-sized wheels and tires help transform the TG-10 chassis into a 1/8-scale Mini Cooper.

C: An airplane-style muffler routes exhaust fumes through a rubber hose that exits under the rear bumper. Power-robbing!

D: Easily removeable one-piece molded radio tray for quick maintenance.

E: To ward off damage, a pre-cut foam mini-bumper comes standard.

decal sheet even has the proper stripe scheme from John Cooper Racing. And the wheels are superbly accurate models of the eight-spoke Sports Style rims that Rover offers. The tires that come with the Mini are the same foam insert-supported racing slicks that come with most of the TGX kits, so super-size replacements from Tamiya, HPI, Kyosho, and Ride will fit just fine when the stock rubber wears out.

What We Don't Like

(1) The lack of suspension tuning options is a bit disappointing. Tuning is limited to tire compound, shock oil viscosity, ride height, and camber and toe angles. Not like the kit is meant to be raced, but we still like some more flexibility out of the box.

(2) Although the body is well detailed, we're missing the extras that make a Tamiya kit especially beautiful. Namely, a molded windshield wiper, molded side-view mirrors, a chrome grille, molded headlights, and molded taillights are con-

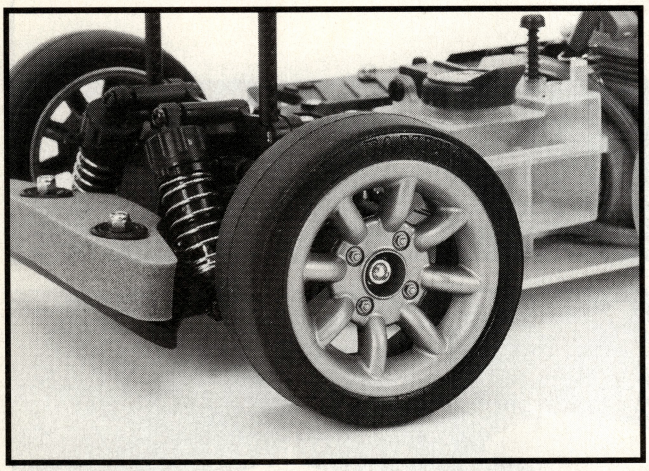
Test Gear



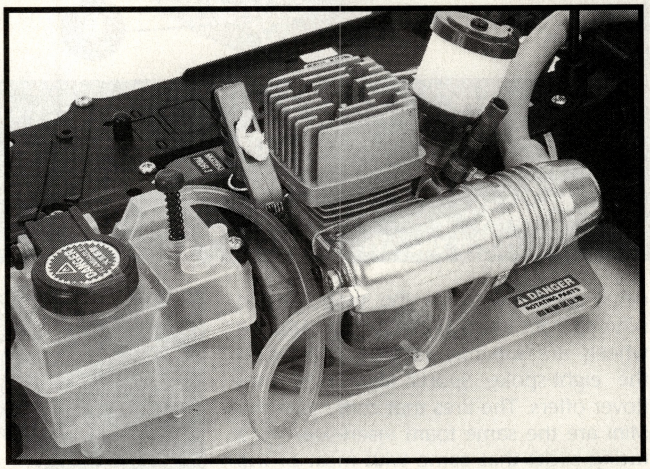
The "big" Mini (left) poses next to Tamiya's 1/10-scale Mini Cooper. As you can see, there's quite a difference in size!

- Airtronics M8 FM Radio
- Hitec HFS-04M1 FM Receiver
- Multiplex Profi mc/V2 servo
- Multiplex 3 BB servo (throttle/brake)
- Byron Originals Race Fuel (20%)





The best part of the transition from 1/10-scale to 1/8-scale are these awsome-looking eight-spoke wheels and slick tires. This combo hooks up pretty well on regular old pavement. "Super" sized tires from other companies will also fit.



The included FS-12LT engine provides decent, if not blistering, perfomance. Ironically, the supplied muffler and extension tube substantially hinder the performance of the engine. A tuned muffler would be a great modification.

spicuously absent from this kit. It is as if Tamiya got lazy and decided not to make the molds. We pray that this isn't indicative of future policy.

(3) The muffler alone robs the engine of power, but add that long exhaust routing to the equation and it adds up to a severely stifled motor. We've seen what the FS-12LT engine is capable of, and this exhaust setup isn't doing it justice.

(4) Tamiya's high-torque servo saver really should be included with this kit. The big tires are just too much for the steering servo saver that comes with the Mini.

What we like

(1) The manual, as usual, is the same excellent Tamiya quality we are accustomed to.

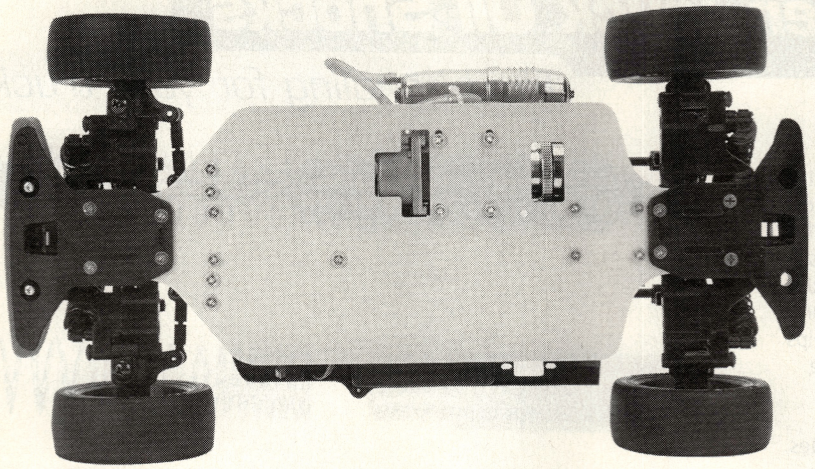
(2) Building the chassis is easy and actually very enjoyable. We relish that feeling that you get when two pieces fit together so perfectly that it almost seems like they went together by themselves. Likewise, because of the clean chassis design, maintenance is also a breeze.

(3) The body, though lacking the detail we have come to expect from Tamiya, is still gorgeous.

(4) The wheels are almost cooler than the body.

(5) The car is stable and easy to drive. The big wheels and tires actually make it more responsive than the small-wheeled versions of the stock TG-10 kits.

(6) Having adjustable tie rods is nice, especially when some other companies are offering fixed-length links is some of their kits. (We'll be picking up our campaign for turnbuckle tie rods to be included in even stock kits again soon.)



Type: 1/8-scale, 4WD, nitro-powered touring car

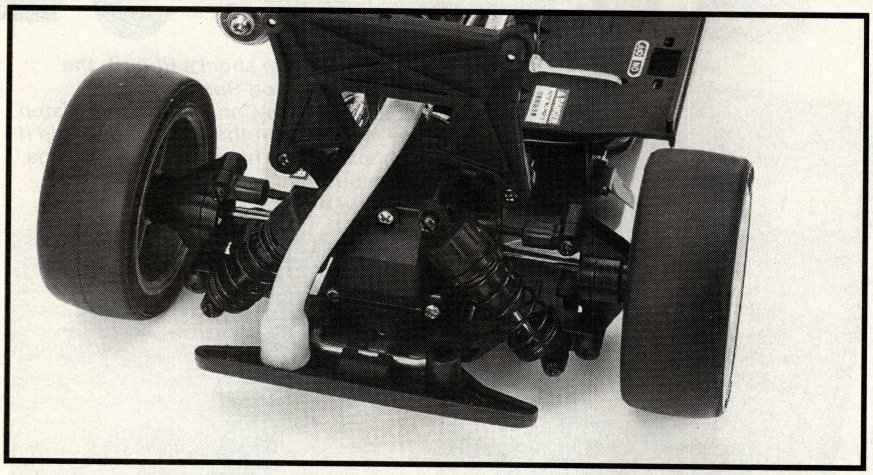
Manufacturer: Tamiya America, Inc., 2 Orion, Aliso Viejo, CA 92656-4200 • phone (714) 362-2240; fax (714) 362-2250

Price: $398 MSRP

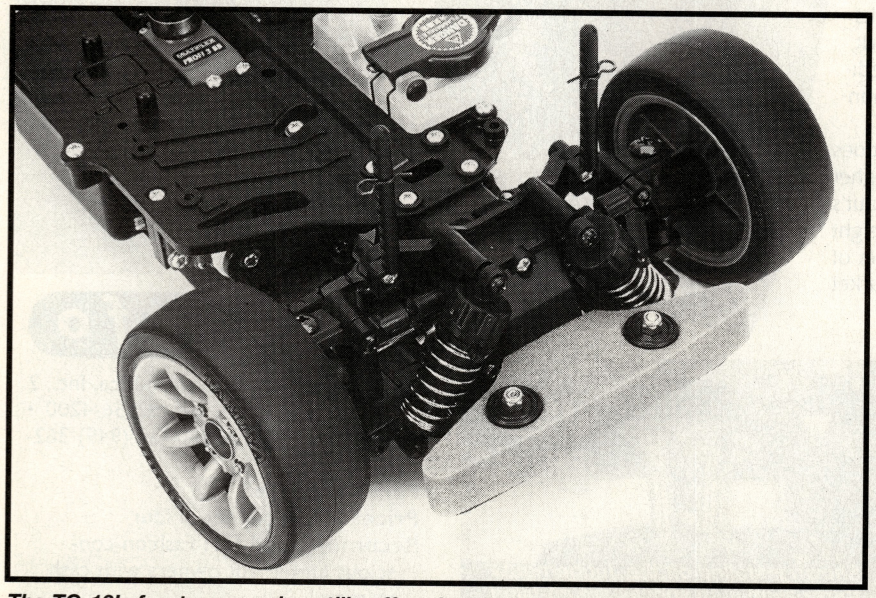
What you get: Complete rolling chassis kit. *Required items: two-channel radio system with two servos, glowplug igniter, glow engine fuel, polycarbonate paint, CA adhesive for the tires.*

Length 15.3in./390mm
Width 8in./202mm
Wheelbase 10in./257mm

The TG-10 doesn't really need a countersunk chassis—the plastic bumper extend downward past the screw heads anyway.

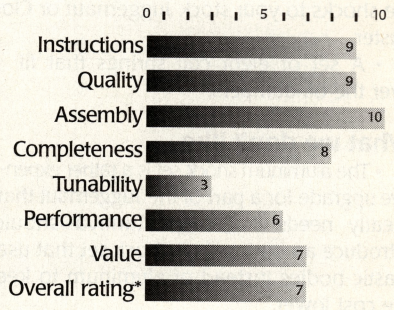


Up your nose wid a rubba hose! No sweathogs here, but we'll make due when describing how much we hate this rubber muffler extension tube. Get rid of it and learn to live with an oily mess on the inside of the body.



The TG-10's front suspension still suffers from over-the-top steering slop. The car still manages to feel precise despite the excessive play in its suspension, and more specifically, its steering linkage.

Ratings



**The overall rating is not the average of the subjective ratings. It is our overall appraisal of the kit's quality and features.*

What we really think

Mini fans should purchase this kit for two reasons: it is fun to drive, and it's a big Mini. With a length of 390mm, the only Minis out there that are bigger are the real ones. Using 1/8-scale parts on the TG-10 platform was a masterstroke of creativity (or is it marketing?). Because of this, spare parts are plentiful, as are hop-ups and add-ons.

The Rover Mini Cooper Racing is a durable kit that is easy to build, maintain, and live with. The engine is not fussy and the handling is neutral and predictable. Although it's not the fastest nitro car out there, overall we'd have to say that this is a fun kit that should see lots of parking lot time. ◆

SOURCES

Airtronics, 1185 Stanford Ct., Anaheim, CA 92805 • phone (949) 978-1895; fax (949) 978-1540

Byron Originals, Inc., P.O. Box 279, Ida Grove, IA 51445 • phone (712) 364-3165; fax (712) 364-3901

Hitec, 10729 Wheatlands Ave., Suite C, Santee, CA 92071 • (619) 258-4940

Multiplex USA, 5399 Harter Ln., La Canada, CA 91011 • phone (800) 375-1312; fax (818) 790-1346

Product Test

Tamiya Monster Truck Oil Shocks

Fluid handling for your truck

What it does

Tamiya's Monster Truck oil shocks replace the stock plastic shocks of the Juggernaut and Clod Buster with high-quality, aluminum oil shocks. The oil-filled damping chambers provide greater resistance to the action of the suspension than do the stock kit's spring-only dampers. More damping prevents the suspension from bouncing and helps keep the tires on the ground where they belong.

What it has

- A set of four complete shock assemblies, including the reservoirs (bodies), pistons, shafts and caps. You'll need two sets to replace all eight shocks on your truck.
- All of the hardware needed to install the shocks to your stock Juggernaut or Clod Buster.
- A set of eight coil springs that fit over the oil dampers.

What we don't like

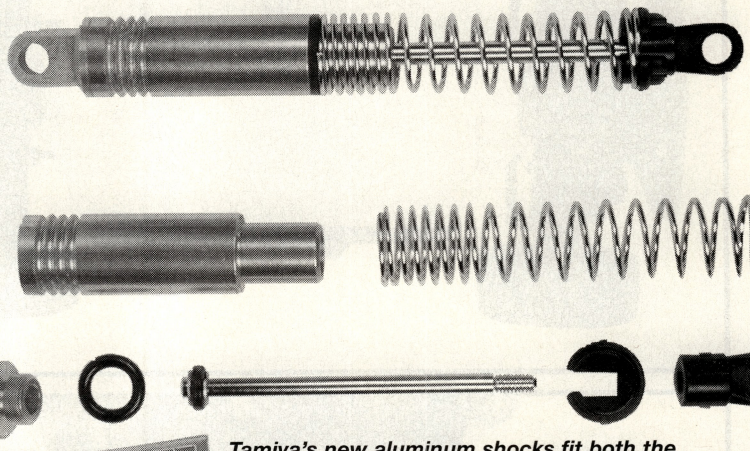
- The aluminum shock set is a rather expensive upgrade for a part of the Juggernaut that greatly needs it. Perhaps Tamiya should introduce an optional oil shock set that uses plastic bodies instead of aluminum to keep the cost lower.

What we like

- The fit and finish of the Tamiya shocks are of the highest quality. Building the shocks and installing them on your truck is very easy to do, and everything you need to make the swap is included in one package.
- Once installed, the gold-anodized oil shocks add significantly to the "cool factor" of your truck, especially drawing more attention to the incredibly detailed suspension of Tamiya's newest monster truck, the Juggernaut.
- The addition of oil-damped suspension does offer some handling improvements over rougher terrain, although we still think that the Juggernaut's leaf-spring suspension is far too stiff for the weight of the truck. Tamiya should come out with a set of softer leaf springs for the Juggernaut. Aftermarket companies, are you listening?

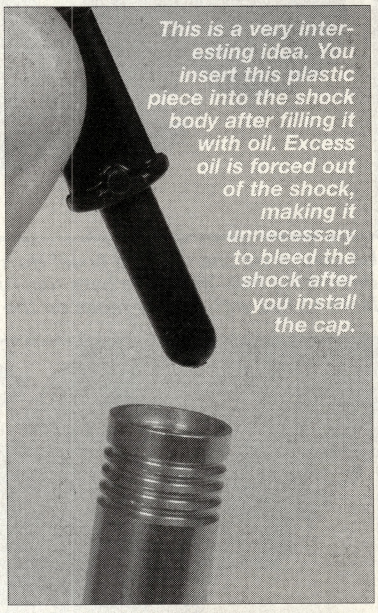
What we really think

The Juggernaut is truly a truck that's intended for "show" as much as it is for "go," so it's no surprise, given the truck's very stiff suspension, that we noticed very little change in handling after the addition of these oil shocks. For pure esthetic appeal, however, these gold shocks can't be beat. If you can justify the cost, Tamiya's oil shocks for the Juggernaut are a worthy upgrade—right after the addition of a full set of ball bearings for the drive train and hotter motors! ◆

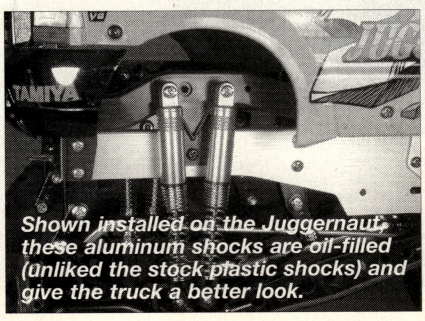




Tamiya's new aluminum shocks fit both the Juggernaut and the Clod Buster. The aluminum shocks have tiny, non-adjustable piston that's barely larger than the E-clips that hold it onto the shock shaft! The progressive springs look cool, but these shocks are more for looks than for performance.



This is a very interesting idea. You insert this plastic piece into the shock body after filling it with oil. Excess oil is forced out of the shock, making it unnecessary to bleed the shock after you install the cap.



Shown installed on the Juggernaut, these aluminum shocks are oil-filled (unliked the stock plastic shocks) and give the truck a better look.

info

Manufacturer: Tamiya America, Inc., 2 Orion, Aliso Viejo, CA 92656-4200 • phone (949) 362-2240; fax (949) 362-2250
Part no.: OP-369
Price: $29.99 per set of four
Recommended for: Fashion-conscious Juggernaut owners with cash to spare!
Rating: ⊛⊛⊛●●

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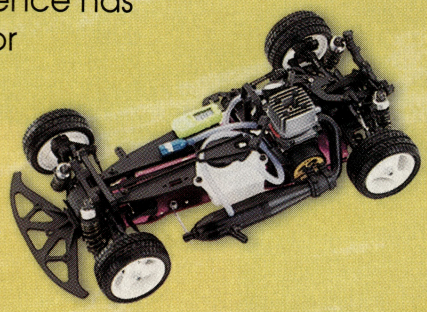

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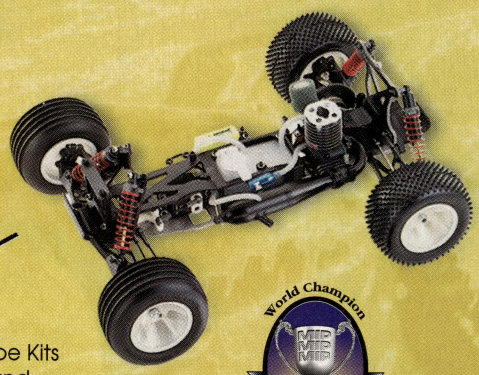

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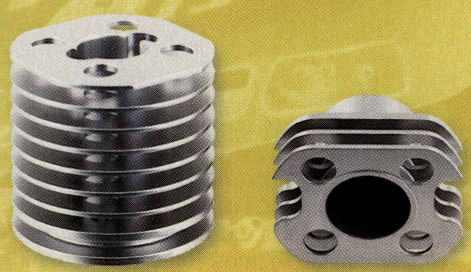
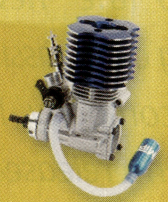
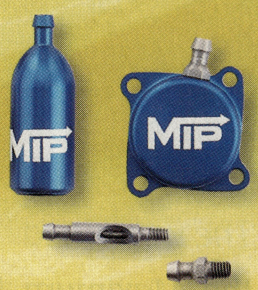
3058	Rear Boost Chamber









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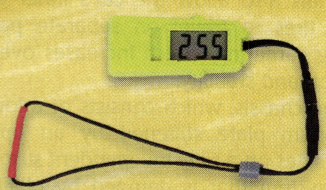

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#3053 Quad Rear Stinger Kit

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The word "neo" means "new," so it's not surprising that the Maximum Nitro Pro from Neo (the "new" company)—an all-new 4WD nitro touring car chassis—has its share of innovative features. As a company, Neo was thrust into prominence last year when it released a series of 1/10- and 1/8-scale on-road racers to the U.S. market. Now, Neo is ready to infuse what it has learned from the highly competitive gas-racing market to the burgeoning 1/10-scale sedan market. Golden Horizons, a North American importer of the Neo series of cars, sent us an early Maximum Nitro kit for evaluation. Here are our thoughts after building and running this pro-level kit.

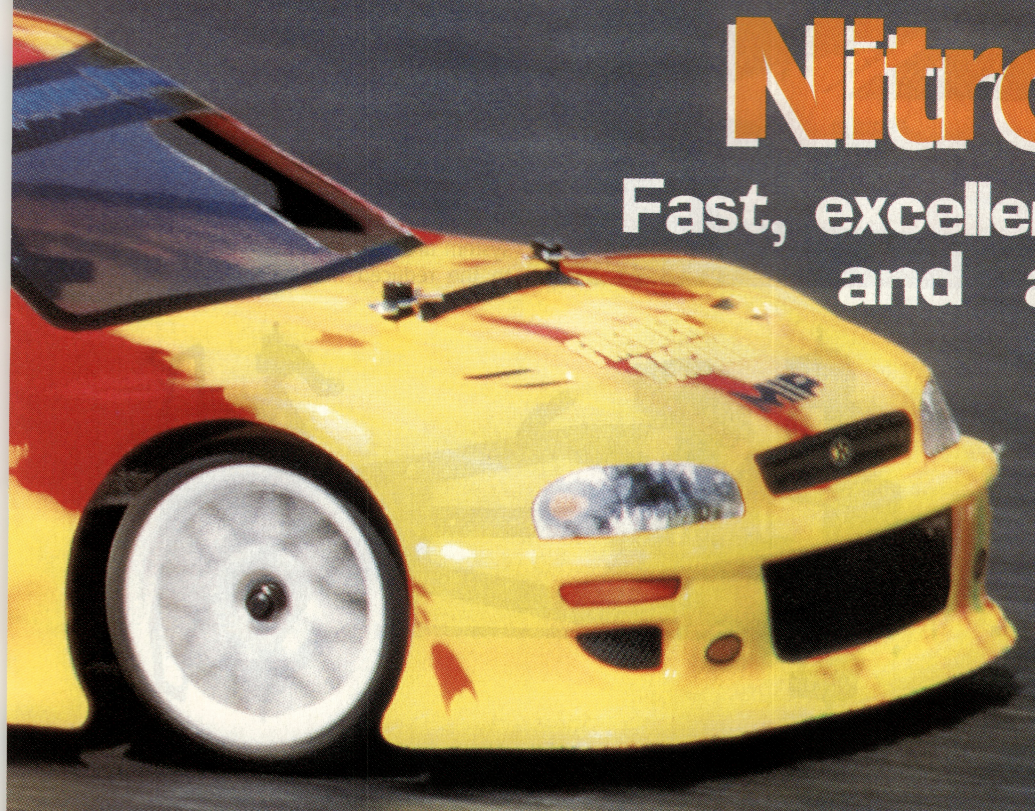
Maximum Nitro: the basic rundown

In its basic configuration, the Neo is similar to most other nitro touring car chassis in that it uses a three-belt drive train to transfer power from its mid-mounted engine to all four wheels. There is a ball-type differential at each end of the car that acts like the limited-slip differential in a full-size car, preventing one tire from losing drive force should the opposite tire lose traction and "unload." The differentials also allow the car's inner and outer tires to travel on separate paths during cornering, which increases overall traction and stability.

The chassis, which consists of a lower aluminum plate stiffened by an upper deck, rides on a fully independent suspension system that is damped by oil-filled shocks at all four corners. As with most nitro sedans, the Neo's suspension can be tuned just like that of a full-size race car (sometimes, an R/C car's suspension is *more* tunable than a real race car's!).

Neo Maximum Nitro Pro

Fast, excellent handling and a suprising bargain!



Full race spec

The most striking feature of the Neo kit is that it comes with nearly every upgrade you'll need for racing right in the box.

• For starters, the blue-anodized 2.5mm aircraft-aluminum chassis has been fully countersunk so that the screws that hold all the components to the chassis don't scrape the ground and slow the car.

• Both the upper chassis deck and the front and rear shock towers are made of lightweight and strong carbon-fiber material.

• Every rotating part of the drivetrain, including the insides of the ball diffs, is supported by a high-quality ball bearing for reduced friction and higher top speed.

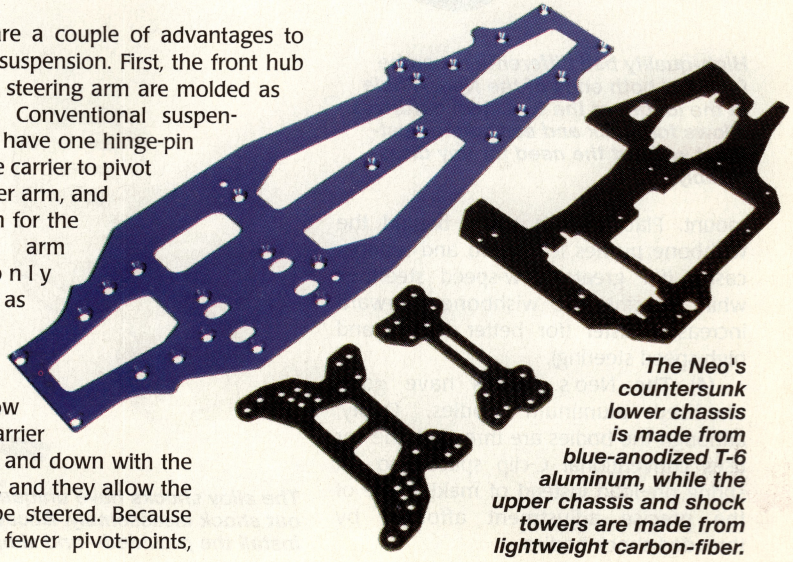
• The suspension and drive train bulkheads are molded from a stiff glass-filled nylon composite. Most of the suspension is very free from flexing, and the fit of the parts is very good.

What makes the Neo stand out?

(1) The Neo uses a pillow-ball suspension system. This type of suspension differs from conventional suspension in that the front and rear hub carriers attach to the ends of the suspension arms with large-diameter steel balls rather than hinge-pins.

There are a couple of advantages to pillow-ball suspension. First, the front hub carrier and steering arm are molded as one piece. Conventional suspensions must have one hinge-pin to allow the carrier to pivot on the lower arm, and another pin for the steering arm (commonly referred to as the "king-pin"). The pillow-balls allow the hub carrier to pivot up and down with the suspension, and they allow the carrier to be steered. Because they have fewer pivot-points, pillow-ball suspensions generally have less slop than conventional suspensions.

Also, the pillow balls are threaded into the ends of the suspension arms, which



The Neo's countersunk lower chassis is made from blue-anodized T-6 aluminum, while the upper chassis and shock towers are made from lightweight carbon-fiber.



allows you to easily set the camber of each wheel as well as—to a moderate degree—the car's front and rear widths.

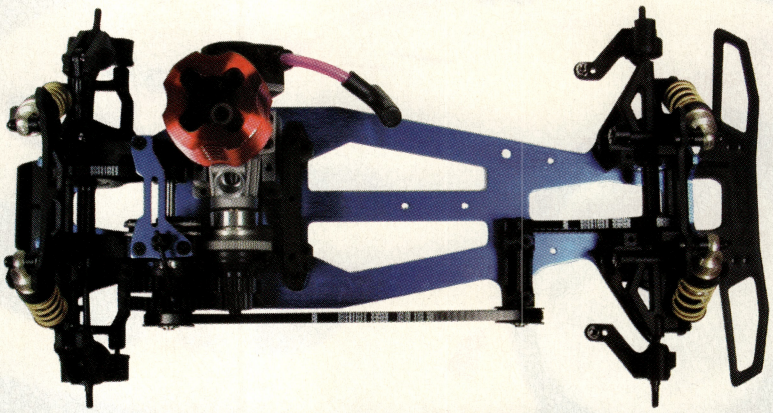
(2) Another advantage of the pillow-ball suspension is that the rear wheels' toe-in angle can be set in a matter of seconds simply by inserting an Allen wrench through the wheel (you don't even have to remove the wheels!) and turning the appropriate pillow ball (either the forward or rearward ball—the lower portion of each rear hub carrier is secured to the arm by two pillow balls).

(3) The Neo's front caster angle (the axis on which the front hub carriers pivot) can be subtly adjusted by altering the placement of a pair of shims located between the upper wishbone and its mount. Placing both shims behind the wishbone pushes it forward and reduces caster (for greater low-speed steering), while spacing the wishbone rearward increases caster (for better turn-in and high-speed steering).

(4) The Neo's shocks have gold-anodized aluminum bodies. Oddly, although the bodies are threaded, the car uses conventional C-clip spacers to set spring pre-load instead of making use of the precise adjustment afforded by threaded shock bodies.

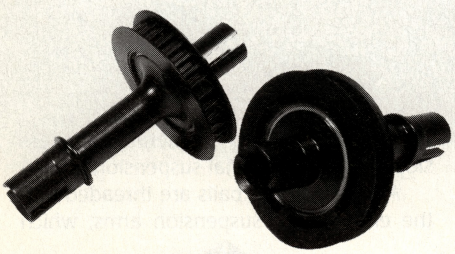
(5) Optional Serpent-style anti-roll bars can be fit to the front and rear suspensions of the Neo. These bars are ball-and-socket style and do a great job of limiting body roll during cornering. We ended up using only the front anti-roll bar for aggressive steering without loss of rear traction.

(6) Rather than rely on a pair of bellcranks to steer the car, Neo designed the Maximum around a center-mounted servo-saver that hooks the steering tie-rods directly to the servo and does away with the weight of a pair of bellcranks, posts, and miscellaneous hardware. The advantages of this center-point steering system are less weight and less slop (due to the reduced number of parts in the steering system). The only drawbacks are that the Ackermann angle (the difference between the steering angles of the left- and right-side front wheels during cornering) is a little extreme (the inner wheel turns a bit too much and may create additional drag), and that the weight of the steering servo is placed a bit high on the chassis, raising the car's center of gravity.

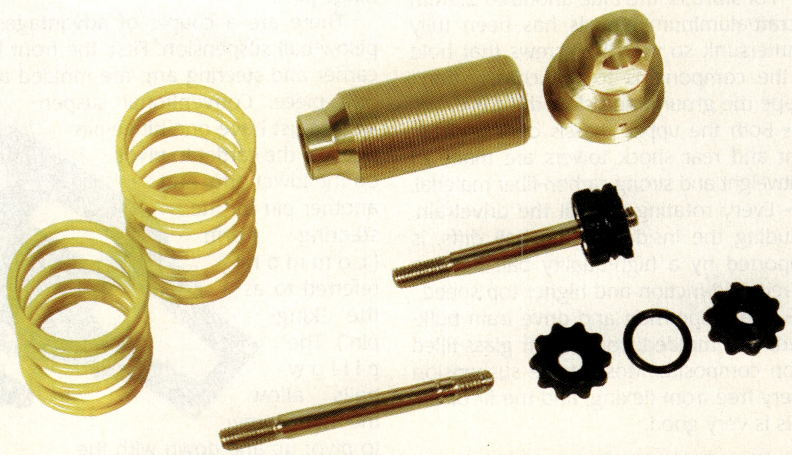


This overhead view shows the layout of the Neo's triple-belt drive train. Note the long center belt that connects the two pulley shafts-an unconventional design.

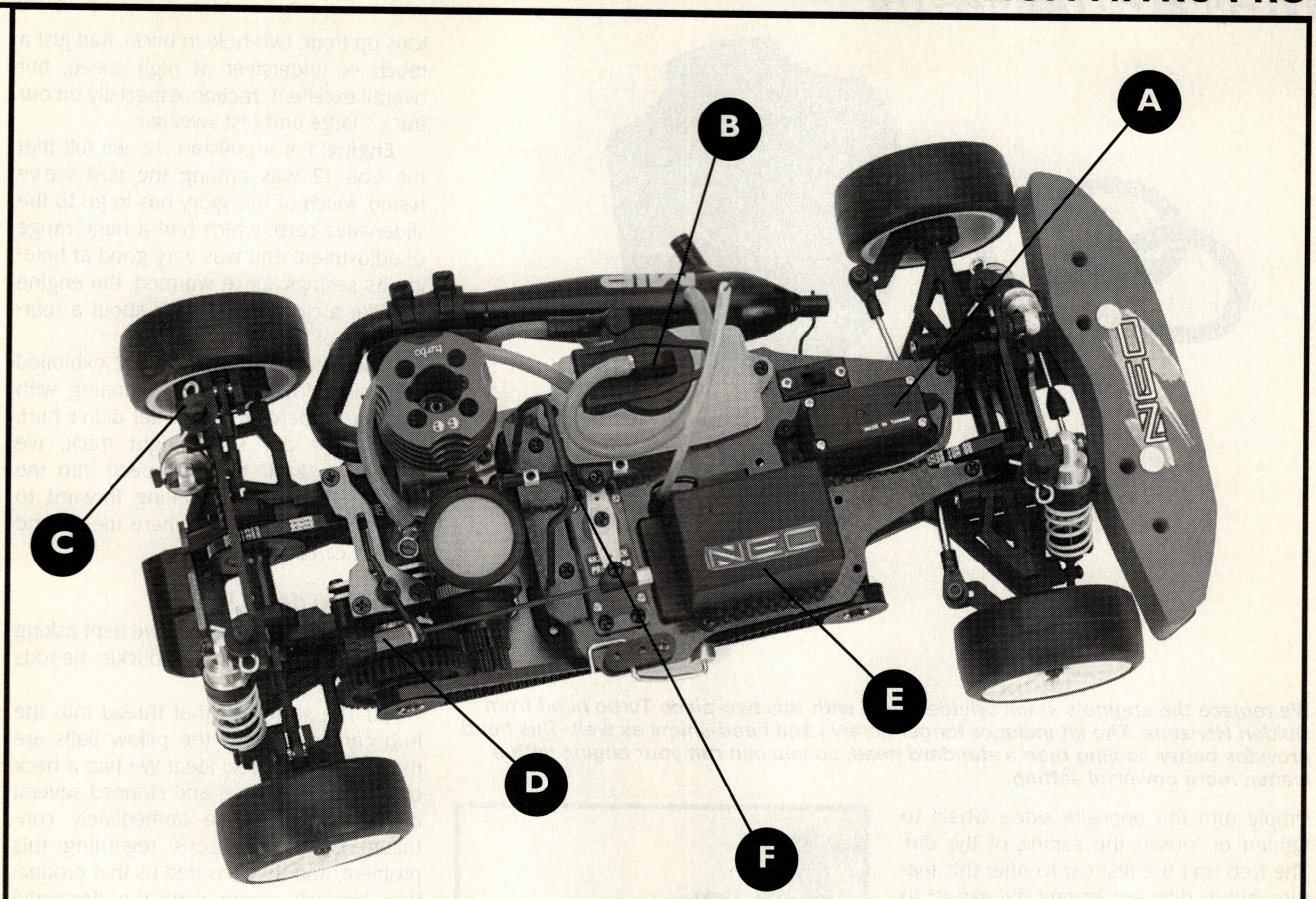
Neo also includes an innovative adjustable piston for each shock that allows you to alter the piston's valving (how stiff the shock will be) from outside the shock. We didn't use these pistons for our test, as we found it difficult to set each shock equally. Instead, we installed the standard-type two-hole pistons that are also included in the kit.



High-quality ball differentials can be found at both ends of the Neo. A hole in the longer of the two steel outdrives allows for quick and easy diff adjustment without the need for any disassembly.



The alloy shocks have unique pistons that allow for damping to be changed without shock disassembly. Because of their added complication, we chose instead to install the provided—and simpler—two-hole piston discs.



A: Center-point direct steering linkage for slop-free steering and excellent centering.

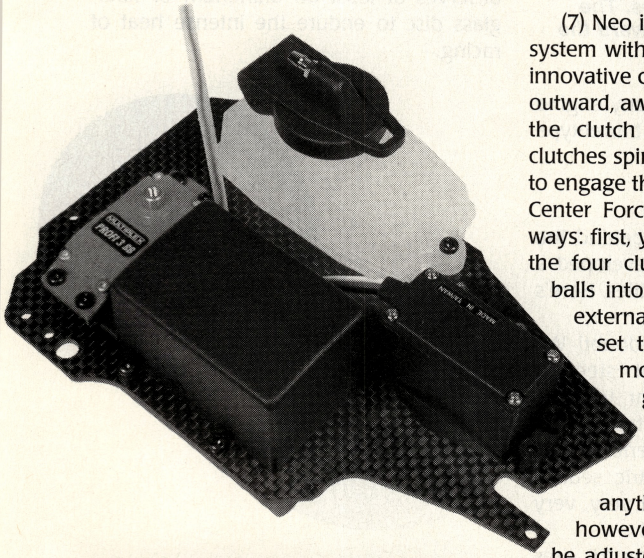
B: Flip-lid 75cc fuel tank with internal baffles to resist fuel foaming.

C: Pillow-ball suspension, independent at all four corners.

D: Two-speed automatic-shifting transmission.

E: Large radio box to protect electronics from dirt and moisture.

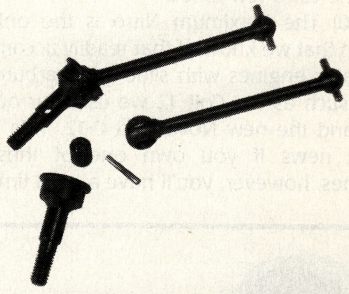
F: Throttle linkage accommodates slide-valve carburators only.



With all the electronics installed, the Neo's radio tray is surprisingly uncluttered thanks to its commodious molded radio box. All the excess wiring simply gets stuffed into the box!

(7) Neo includes its Center Force clutch system with the Maximum Nitro Pro. This innovative clutch has four shoes that push outward, away from the engine, to engage the clutch pinion gears. Conventional clutches spin outward from the crankshaft to engage the inside of the clutch bell. The Center Force clutch is adjustable in two ways: first, you can add weight to each of the four clutch shoes by inserting steel balls into holes in the shoes. Also, an externally adjustable spring is used to set the resistance to the clutch's movement against the pinion gears, so that you can easily and precisely set the rpm at which the clutch engages.

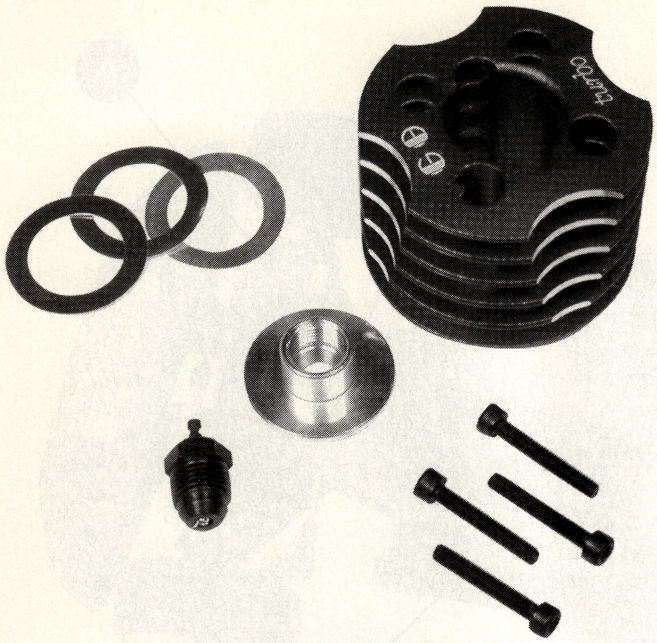
(8) The Neo's ball diffs aren't anything to write home about; however, the way in which they can be adjusted just might be. Easy adjustments can be made simply by inserting an Allen wrench through the longer of the diff's two steel outdrives. Once the Allen wrench has engaged the diff screw, you



CV-what? The Neo's universal-joint driveshafts bear striking resemblance to the design of MIP's popular CVD driveshafts. The shafts were a little rough until broken in.

Test Gear

- Airtronics M8 FM transmitter
- Colt 12 pull-start engine
- Byron Originals 30-percent Race Fuel
- Futaba S9450 digital steering servo
- KO-Propo KR-297FZ FM receiver
- MIP Side Pipe Kit for touring cars
- Multiplex Profi 3 BB throttle servo

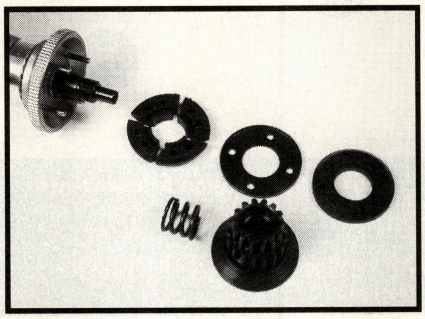


We replace the engine's stock cylinder head with this two-piece Turbo head from Golden Horizons. The kit includes longer screws and head-shims as well. This head provides better cooling than a standard head, so you can run your engine with a leaner, more powerful setting.

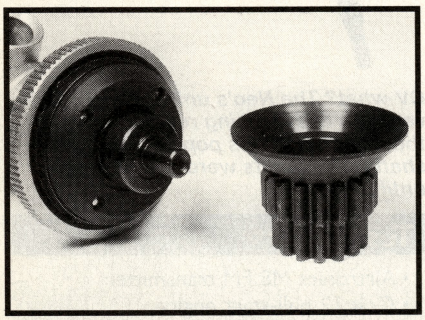
simply turn the opposite side's wheel to tighten or loosen the setting of the diff. The Neo isn't the first car to offer this feature, but its diffs are among the easiest to set.

(9) All four wheels are spun by universal-style driveshafts that are nearly identical to MIP's popular CVD shafts. We observed a small amount of binding in the driveshafts after they had been assembled, but don't let this worry you, as the binding eventually goes away once you've run the car a few times.

(10) The Maximum Nitro is the only sedan that we know of that readily accommodates engines with slide-type carburetors, such as the Colt 12 we used for our test and the new NovaRossi C-12. This is great news if you own one of these engines, however, you'll have a hard time setting the throttle linkage for any engine that uses the more popular barrel-type rotary carb.



Neo's Center Force clutch is very different from conventional clutches. The shoes are pushed outward toward the pinion gear as rpm increases.



As the clutch shoes are forced outward, they push this circular "shoe" against the base of the pinion gear assembly. A spring is used to set the resistance against the shoe and therefore the point at which the clutch engages.

Neo on the road!

After spending some time behind the wheel of the Maximum, we developed a good sense of the car's capabilities. Here's our impression.

Steering: Great without a doubt! We loved the car's center-point steering system, which allowed the car to track dead-straight when exiting turns, and straight-line tracking is excellent. During our tests, not even the electric sedans could hang with the Neo on a very, very tight track with lots of hairpins!

Tires: Big surprise here; the kit tires worked very well on our clean asphalt track, providing neither too much steering or too little. The Neo, with our setup of 60wt. oil in all four shocks (one-hole pistons up front, two-hole in back), had just a touch of understeer at high speed, but overall excellent traction, especially on our track's large and fast sweeper.

Engine: For a pullstart .12, we felt that the Colt 12 was among the best we've tested. Much of this glory has to go to the slide-valve carb, which had a huge range of adjustment and was very good at holding its settings. Once warmed, the engine ran like a clock, firing after about a four-inch pull of the starter cord.

Once broken-in, the Colt 12 exhibited impressive low-end punch (running with Byron's 30-percent Race Fuel didn't hurt, either). For our small, tight track, we elected to "lock" the two-speed into the lower ratio. We are looking forward to racing on larger tracks where the second gearset can be utilized.

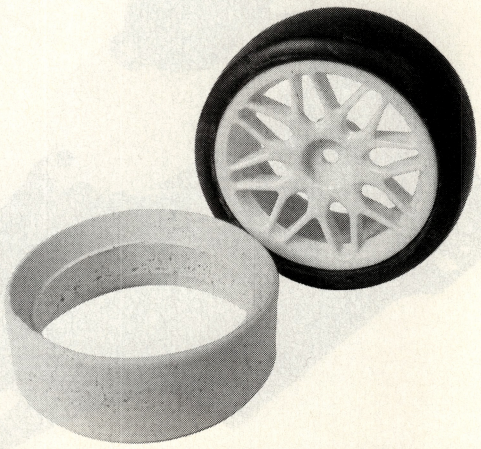
What we don't like

(1) For a "pro" level car, we kept asking ourselves where the turnbuckle tie-rods went!

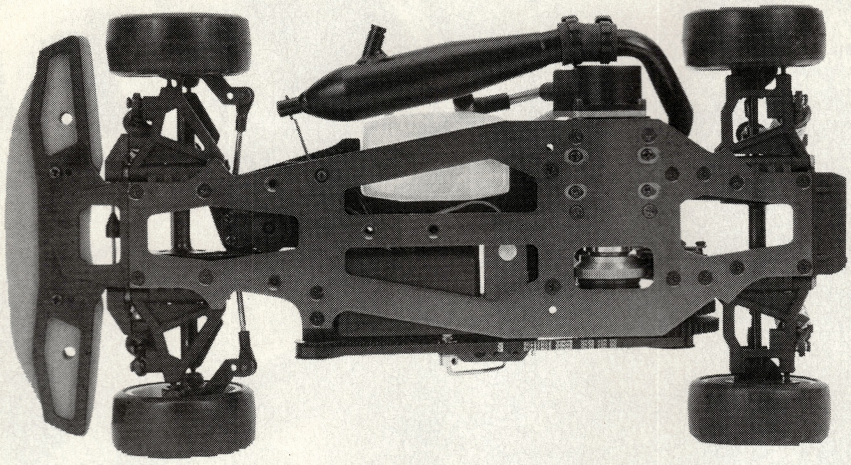
(2) The setscrews that thread into the hub carriers against the pillow balls are made of plastic—bad idea! We had a heck of a time with these, and stripped several during assembly. We immediately contacted Golden Horizons regarding this problem, and they assured us that production kits will come with the (formerly) optional aluminum setscrews.

(3) There are some odd parts placements inside the kit. For example: the plastic diff-adjustment nut holder wasn't bagged with the rest of the diff parts—it was attached to the plastic hex drive-hubs!

(4) The kit's plastic brake disc needs upgrading. A "pro" kit such as this deserves at least an aluminum or fiberglass disc to endure the intense heat of racing.



The kit's tires are surprisingly good on pavement. The slick tires come with Neo's firm molded-foam inserts and are shown mounted on the kit's white, mesh-spoke wheels.



Type: 1/10-scale 4WD nitro sedan.
Manufacturer: Neo, distributed by Golden Horizons Enterprises Co., 311-939 Howe St., Vancouver BC Canada V6Z 1N9 • phone (604) 331-2526; fax (604) 331-2528
Price: $320
What you get: Complete rolling chassis. You must purchase a two-channel radio, fuel, engine, pipe, glow-starter, body and paint.

Length.....14.4in./369mm
Width.....7.5in./190mm
Wheelbase.....10in./254mm
Track (F/R).....5.4in./137mm

The underside of the Neo reveals a smooth chassis with countersunk screw holes and recessed engine-mount screws to allow for the lowest ride-height possible.

(5) The Neo is set up for slide-valve carbs only. This is good if you have this type of engine, but bad if you don't! Neo probably should offer some type of rotary-carb installation kit if they would like this car to appeal to a larger audience, as rotary carbs are more common.

What we like

(1) The Neo offers a very high level of standard equipment for a surprisingly reasonable price.

(2) The Maximum Nitro's chassis is among the most highly adjustable available. There are plenty of settings to tinker with, but you'll never feel that you've gotten in over your head.

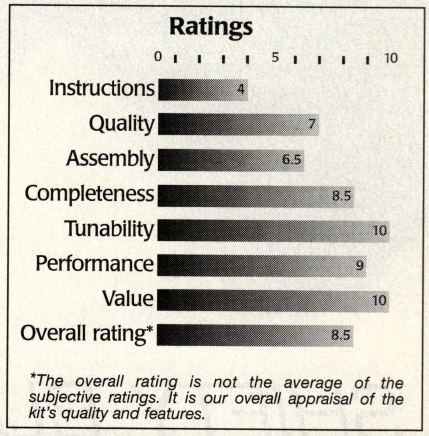
(4) The included Center Force clutch is awesome. We would use this type of clutch on every nitro vehicle in our stable if it fit!

(4) The incorporation of a sealed radio box into the car's design is a welcome touch when lightning-quick fuel stops are needed. No more worrying about fuel spilling on the receiver.

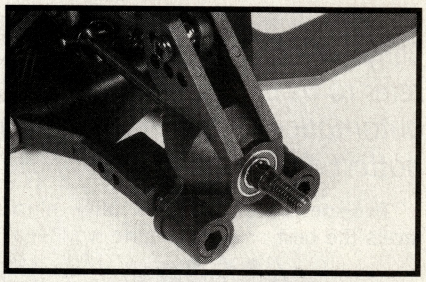
(5) The kit tires and firm molded-foam inserts work surprisingly well on clean pavement!

What we really think

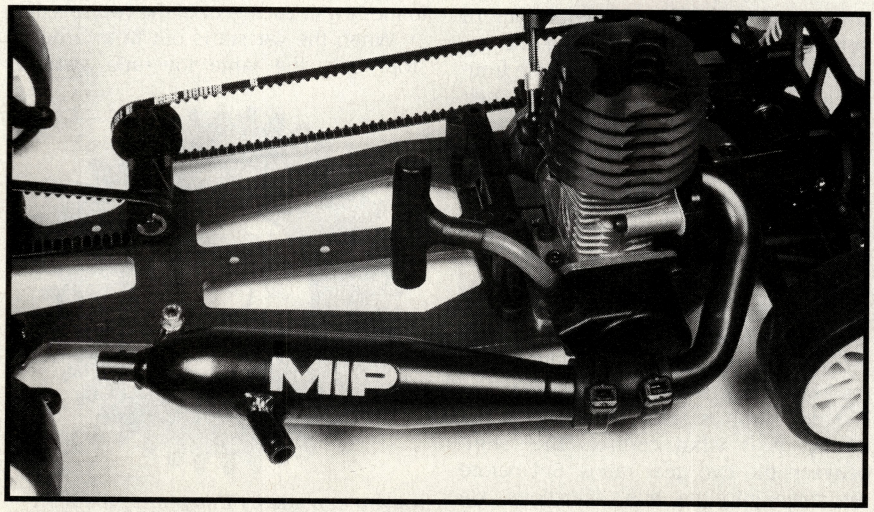
With so many nitro sedans being released, few have the combination of value, performance and features that allow them to stand out from the crowd. The Neo Maximum Nitro represents an exceptional value, but one that's not without compromises. Assembly is a little difficult, and the instructions are less than clear, but otherwise this is a kit of very good quality that performs exceptionally well on the track. We recommend this car to anyone except those without any prior R/C building experience. If you know a bit about construction and setup, the Neo will be a rewarding experience. ◆



**The overall rating is not the average of the subjective ratings. It is our overall appraisal of the kit's quality and features.*



This view of the Neo's rear suspension shows the pillow-ball design that attaches the hubs to the suspension arms by large-diameter steel balls that provide easy adjustment and good durability.

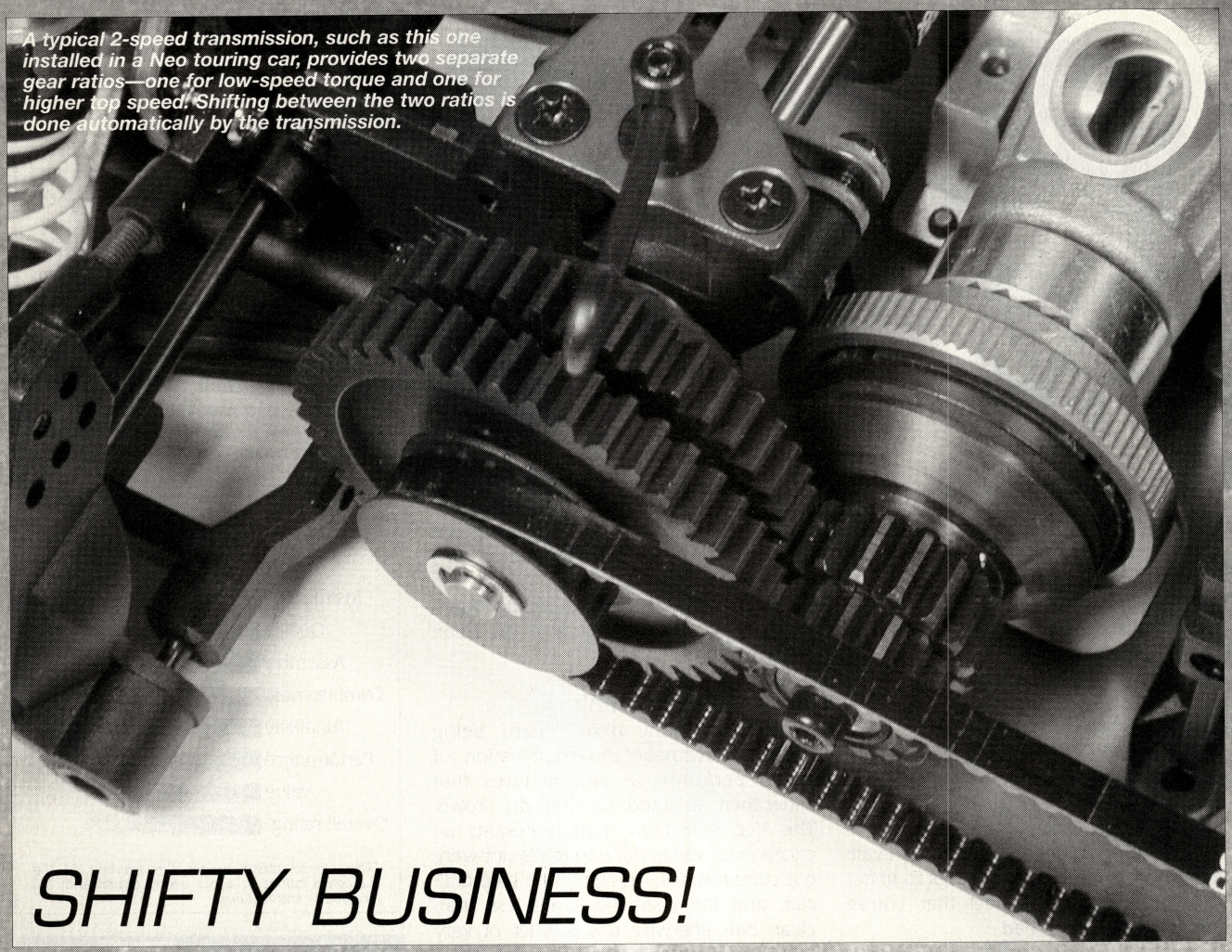


The MIP pipe shown installed on Golden Horizons' Colt 12 pull-start engine. Note how the MIP manifold neatly wraps around the engine's pull-start mechanism.

SOURCES

Byron Originals, Inc., P.O. Box 279, Ida Grove, IA 51445 • phone (712) 364-3165; fax (712) 364-3901
Futaba Corp. of America, P.O. Box 19767, Irvine, CA 92723-9767 • (949) 455-9888; (949) 455-9899 fax
Multiplex USA, 5399 Harter Ln., La Canada, CA 91011 • (800) 375-1312; (818) 790-1346 fax
KO Propo, distriubted by Great Planes Model Distributors, 2904 Research Rd., Champaign, IL 61826-9021 • (217) 398-6300; (217) 398-0008 fax

HOW 2-SPEED TRANS

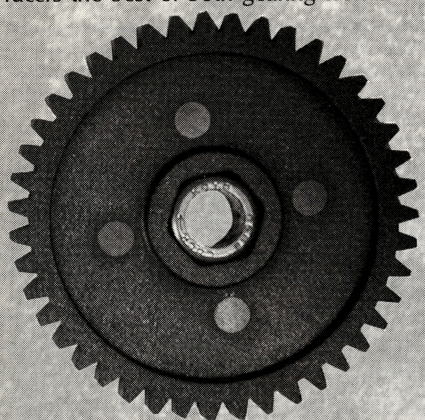


A typical 2-speed transmission, such as this one installed in a Neo touring car, provides two separate gear ratios—one for low-speed torque and one for higher top speed. Shifting between the two ratios is done automatically by the transmission.

SHIFTY BUSINESS!

Originally developed in 1/8-scale on-road racing—what many refer to as the "Formula 1" of R/C—the technology of two-speed automatic-shifting transmissions has found its way into today's hottest growing segment of the R/C hobby—nitro sedans.

Two-speed transmissions offer nitro racers the best of both gearing worlds—a low ratio for quick acceleration out of turns, and a higher ratio for ballistic top speed. While most people have little trouble installing a two-speed tranny in their sedans, very few actually understand how these tiny mechanical marvels function. That is the purpose of this article; to show you how a two-speed tranny works, and how you can best tune yours to improve your car's performance!



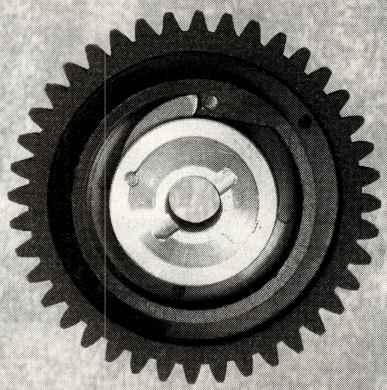
Once the high-speed gear is engaged, the low-speed gear free-wheels on the pulley shaft on a one-way bearing that's been pressed into the gear's center.

Two-speed basics

A typical two-speed tranny contains three major components: the drive hub, the low-ratio gear and the high-ratio gear. The drive hub is really the heart of the tranny; it is what controls the "shift" between the two gear ratios. But before we delve into the hub's functions, we should explain the basic operating principle behind the tranny as a whole.

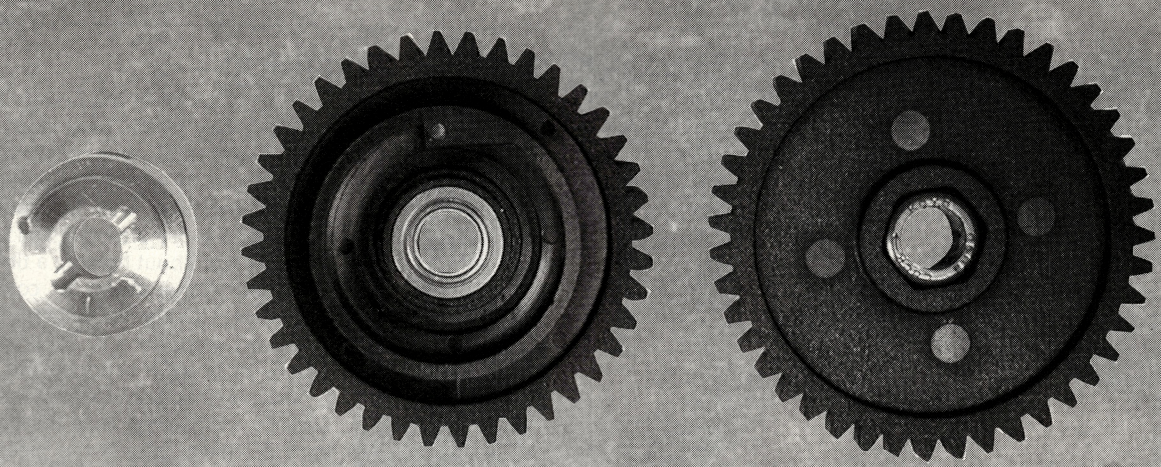
The two-speed tranny is always placed on the main pulley shaft of the car, and the tranny's two main gears always mesh directly with the engine's pinion gear (in the case of a two-speed, there are actually two "stacked" pinion gears on the engine, one to mesh with each gear of the two-speed).

When the car starts out from a dead stop, only the large low-ratio gear is



As you can see by this photo, the shift hub's arm swings out and engages a pin inside the high-speed spur gear.

MISSIONS WORK



The three major parts of most 2-speeds are, from left to right, the shift hub, the low-ratio spur gear and the high-ratio spur gear.

driven by the pinion gear—the smaller high-ratio gear can spin freely on the pulley shaft at this point. As the car builds speed, the gears and the drive hub begin to spin at a higher rpm. When a certain rpm is reached, centrifugal force (a force that flings an object outward, away from the center of rotation) begins to force a small metal arm out from the center of the drive hub—much in the same way as your nitro car's clutch shoes are flung outward to engage the inside of the clutch bell.

As the metal arm begins to protrude from the drive hub, it engages a metal pin, or notch, inside the gear of the two-speed's higher gear ratio. Because the drive hub is always attached to the pulley shaft, when the arm locks to the high ratio gear, the gear also becomes attached to the pulley shaft, and "takes over" powering the car from the gear of the lower ratio.

But what happens to the larger of the two tranny gears—you know, the one that was driving the car when we started out? As we mentioned, the larger gear is attached to the pulley shaft. But not by a pin or screw; rather, by a one-way bearing, a type of needle bearing that spins in one direction only. As the small, high ratio gear takes over the driving chore, the pulley shaft, which is now rotating faster than the low ratio allows, simply spins inside the high-ratio gear's one-way bearing. Simple, right?

When you let off the throttle or use the brakes to slow the car, the two-speed tranny begins to spin at a lower rpm. As it slows, the centrifugal force that originally flung the metal arm away from the drive hub begins to subside, and eventually, the arm is retracted to the point where it no longer engages the pin or notch of the high-ratio gear. When this happens, the high-ratio becomes disengaged in favor of the low ratio that we started out with. This is called a "downshift."

Tuning the shift point

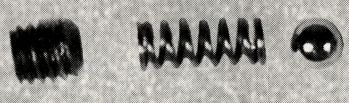
Now that you have basic understanding of how a two-speed tranny works, here's how you can best utilize it to improve your car's performance. As the metal arm of the drive hub is used to shift between one ratio and the other, determining when the arm should begin to engage the high-ratio gear is what you use to set the point at which the tranny shifts from first to second gear.

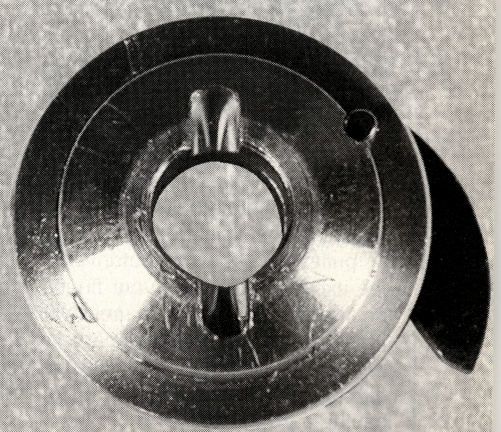
To prevent the metal arm from flinging outward as soon as the drive hub begins to spin, the hub also contains a tiny spring that acts against the arm. The spring counters the force of the spinning hub against the metal shift arm, but when the rotating force becomes greater, the spring's tension is overcome and the arm is allowed to extend.

To set the point at which the spring's tension is overcome, the spring is retained by a small setscrew, which is threaded into the drive hub. By turning the setscrew inward, you compress the spring and increased its tension. This makes it harder for the rotating force of the tranny to fling the shift arm outward. Because the arm can only engage the high-speed ratio at a higher rpm, the point at which the tranny will shift from first gear to second can now only occur at a higher rpm. Conversely, loosening the spring's tension will make the shift occur sooner, as fewer rpm are required to fling the shift arm from the drive hub.

Conclusion

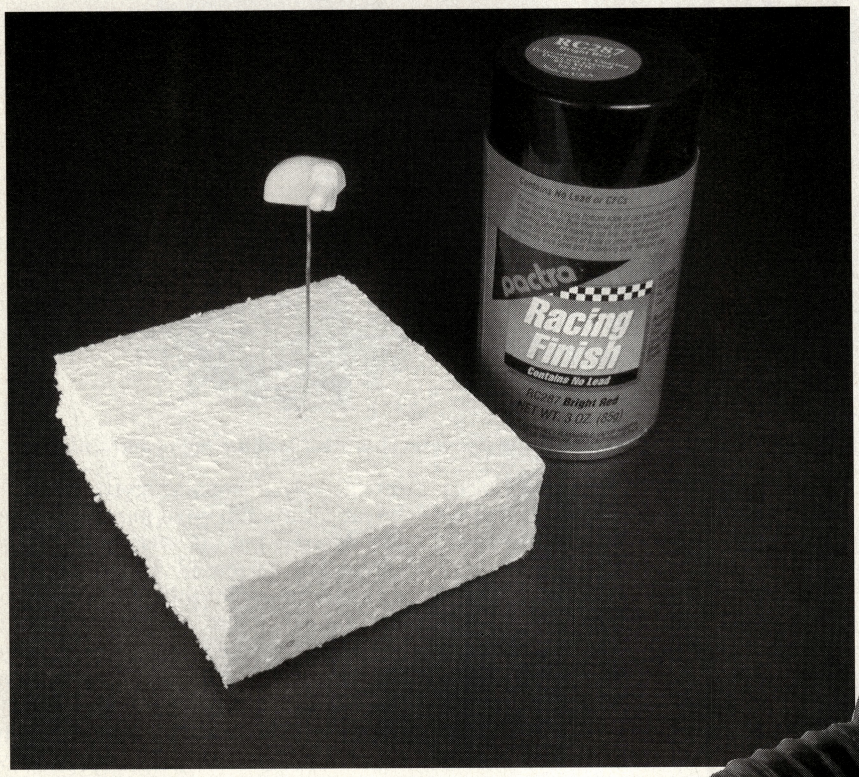
There you have it! When you boil it down to its three basic components, there's nothing that complicated about a two-speed tranny. Now that you have a better understanding of this high-tech marvel, you'll be better able to use your two-speed to take advantage of your engine's powerband, better suiting your nitro sedan's performance to both your driving style and the size and type of track on which you run! ◆





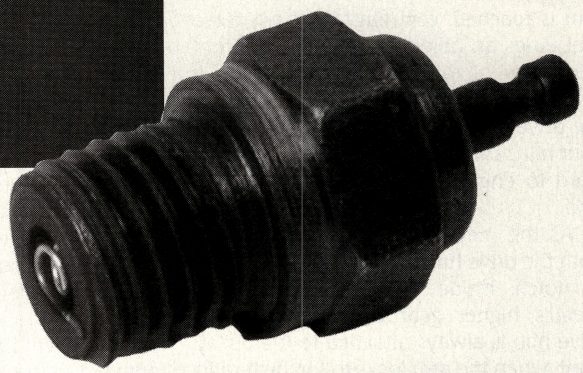
The shift hub has a metal arm that swings out to engage the high-speed spur gear as rpm increases. A small spring, held inside the hub by a setscrew, keeps the arm from swinging out until the proper rpm is reached.

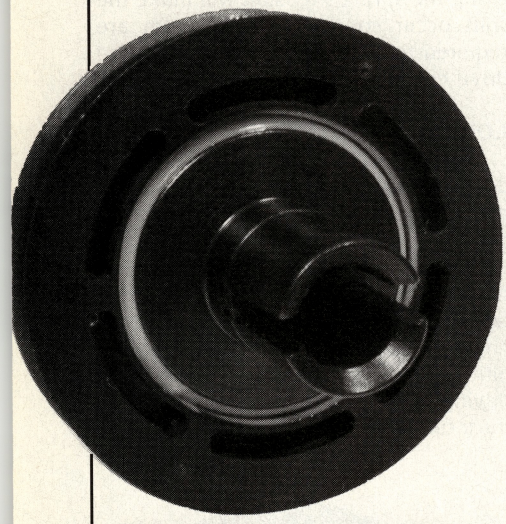
answer man

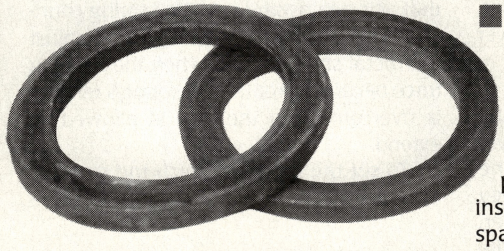


Stick it!

You know what a pain it is to paint all those tiny plastic parts such as mirrors, wings and antennas? Well, it's hard! If you try laying the parts on the ground, the blast from the paint spray can scatter those little bugs all over the place! Forget about holding a tiny mirror with your hand—unless of course you like having "racing red" fingers! The next time you want to add some detail to your car's body, try sticking the parts in a piece of scrap styrofoam. If they won't stick by themselves, tape the parts to a stick or dowel (attach the piece to the stick in an inconspicuous area) and plunge the end of the stick into the foam. Now, those little pieces will be held tightly in place, you'll be able to spray all of the parts easily, and you won't get any more technicolor fingers!





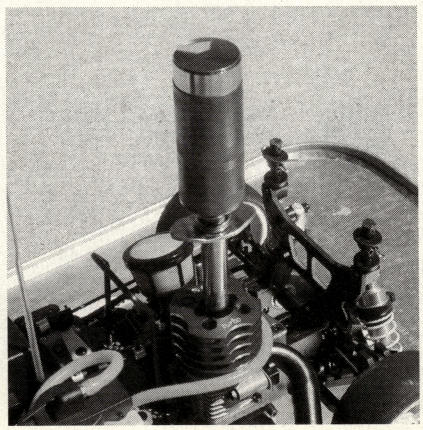


Save your race day

If you foul the glow plug in your O.S. engine, and you are without a suitable spare, there may be hope. If one of your friends has a longer McCoy-type plug (such as a Dynamite MC9), you can use this in a pinch by using two copper washers instead of one. The additional washer spaces the glow plug high enough in the cylinder head so that the plug's glow element will be placed properly inside the combustion chamber.

Send your diff packing!

Here's a way to prolong the life of your ball diff (this should be your life's goal, in case you didn't know). When building or rebuilding your diff, use a lot of grease on the large main diff-balls. Allow the excess lube to squeeze out between the diff gear or pulley and the diff outdrive. Smooth the excess grease with your finger. You'll be amazed how the extra grease will trap the small dust and dirt particles that would normally enter and foul the main diff balls. This is a great way to avoid having a gritty diff!



Keep it running

It's been our experience that some engines don't like to run when they are set at an overly rich mixture during break-in. To keep your new engine from stalling during the important process (breaking in your engine properly is the number one key to increased performance), leave the glow-plug igniter in place during the first few tanks of gas. This will keep the plug's element nice and hot, and keep the engine from stalling.

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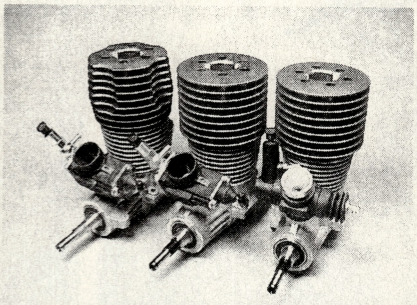
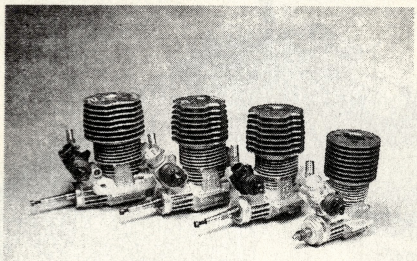


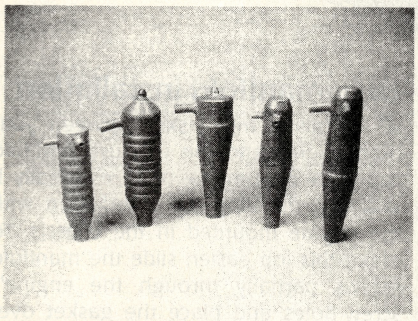
PARIS PICCO ENGINES

On and Offroad versions available with an all new traditional or Torque carb.



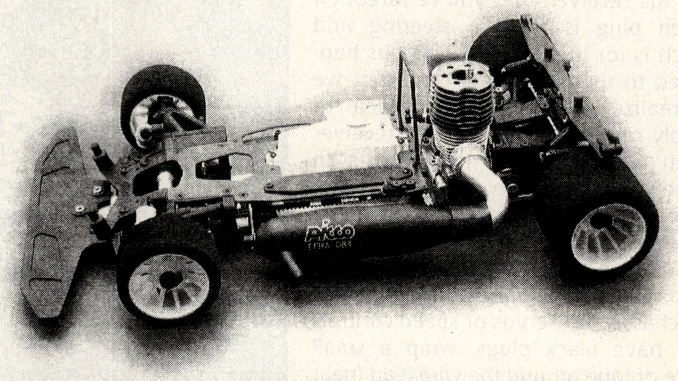
PARIS NOVAROSSI ENGINES

.12, .15, and .21 Nova's for all on and offroad applications!
Check out the new KILLER CX-12



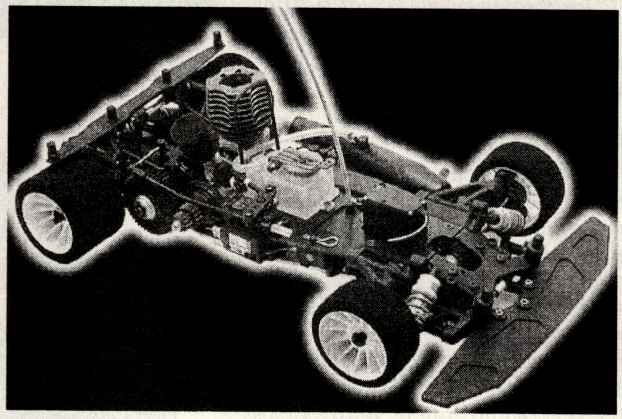
PARIS PIPES

Paris pipes available for every application.
News flash - TurboRing 1/8 pipes coming this summer!



PARIS PICCO 1/8 SCALE INTEGRA

PARIS-PERFORMANCE
PARIS-RELIABILITY
PARIS-POWER



PARIS PICCO 1/10 SCALE INTEGRA

The Paris/Picco Team make a **clean sweep** at the '98 ROAR 1/8 Gas On-Road Nats: 1st & TQ - Mike Swauger, 2nd - Scott Kimbrow, 3rd - Sal Difazio, 5th - Jim Adkins. They all used Paris spec Picco cars with Paris modified P21KSR engines, NovaRossi 086 shot-blasted and Paris hard coated pipe, Nova 7 cold plugs, Action tires, Paris Lola Body and BlueThunder professional formula fuel.

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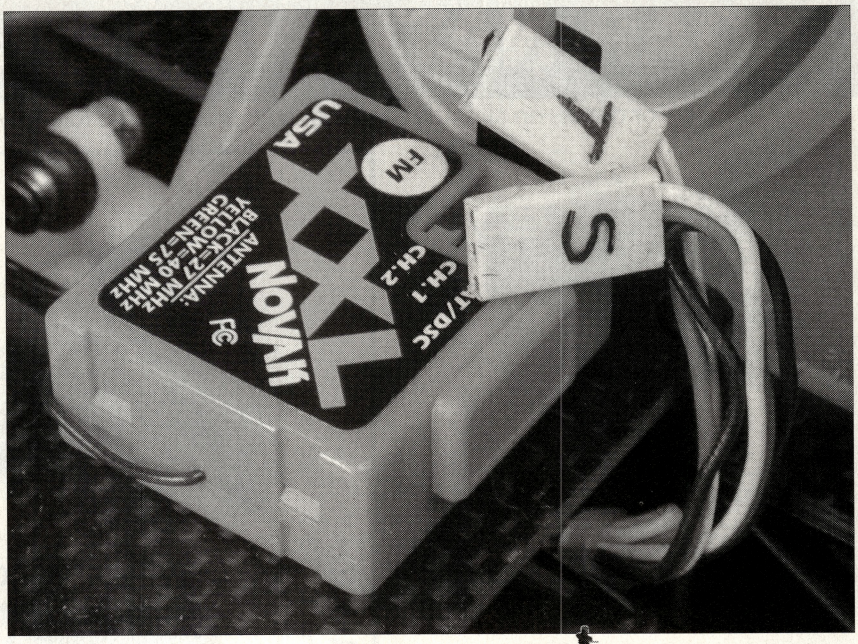
answer man

Which channel is which?

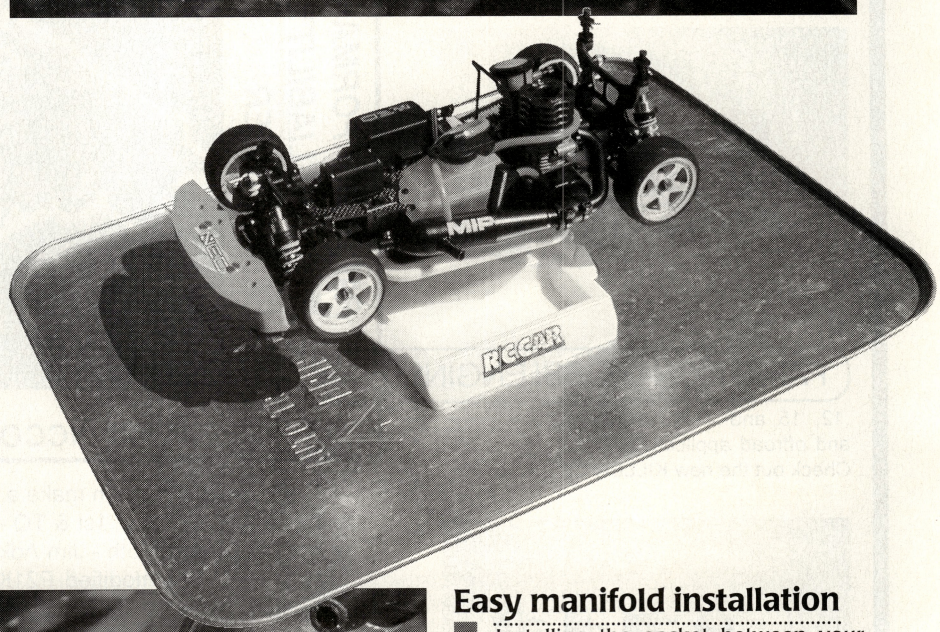
How many times have you meticulously routed and bundled your servo and speed control wires, only to realize later, when it came time to plug them into the receiver, that you've forgotten which plug is for the steering and which is for the throttle? This has happened to us many times, and yes, we do realize that it's not a big deal to simply switch the plugs at the receiver when we realize the mistake. But in some examples, such as gas cars that have sealed radio boxes, this isn't as easy as it sounds.

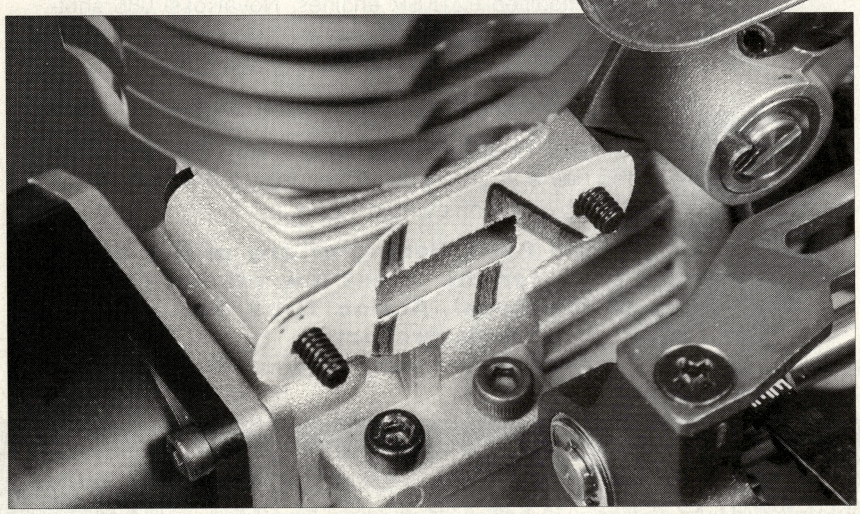
To avoid confusion, you should label each lead before you route it through the chassis. For servos or speed controls that have black plugs, wrap a small piece of tape around the wire lead (near the plug) and mark the tape with either a "T" for throttle or an "S" for steering. For servos with white plugs (such as KO-Propo), mark the plug itself using a permanent-ink marker.



Don't be a drip

If you read our article on how to break in new nitro engines (March '99 issue), you'll remember that we recommend that you run the first tankful of fuel through the engine while the car sits at idle with its wheels off the ground (and with a very rich needle setting). Unfortunately, this also sends a lot of unburned fuel "spooge" out of the exhaust and onto your driveway. Unless you're an uncaring clod, this is undesirable behavior! We found this inexpensive, galvanized steel drip tray at a local auto-parts store, and now use it to catch any fuel and oil drips that come from our idling test vehicles.





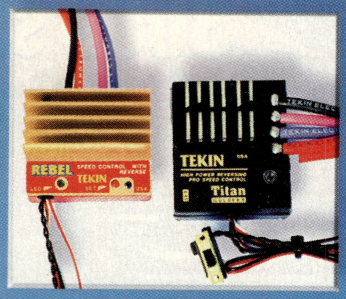
Easy manifold installation

Installing the gasket between your nitro engine and the exhaust manifold can be a pain in the neck—especially if you're performing the installation witb the engine mounted in the chassis. To make this job easier, slide the manifold screws partially through the engine's screw-holes and place the gasket over the screws, which will hold the gasket in position while you attach and tighten the manifold. ◆

Send your tips, questions or comments to **Answerman**, c/o **R/C Car** magazine, P.O. Box 958, Valencia, CA 91380-9058.

R/C PERFORMANCE GEAR

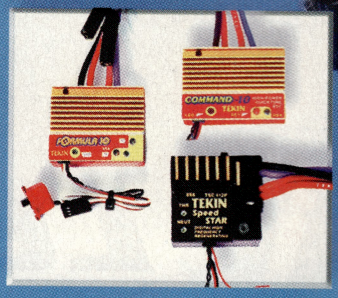




REVERSE ACTION

The REBEL, speed control reliably delivers highspeed forward/reverse/ and brake action at a low price. Unique Thermal Transfer Technology for no over-heating, even with a 10 turn motor. Easy push button setup. Now with new GoldFET III transistors for 40% increased power handling and reduced heat.

The TITAN pumps out maximum amperage with two rows of GoldFET transistors. It can power 10-turn or even dual mild motors, with blazing speed. Built in motor and battery plugs. Features include adjustable reverse delay 0-5 seconds, plus lock-out.



DRIVING FUN

The FORMULA-10 and 412P SPEED-STAR are both are great heavy duty electronic speed controls, at a practical price. No motor worries, the High Torque output won't overload, even with 10 turn modifieds. Smooth proportional throttle control from a slow crawl to wide open. Powerful adjustable braking. Built-in motor diode. Simple manual adjustments. Genuine high frequency operation gives 25% more run-time, plus your motors last much longer.

The COMMAND-10 includes QuickTune one-button setup, and brake light activating wire.
(Lights available separately.)

COMPETITIVE ADVANTAGE

The P-12 and G-12 are our most advanced style, and use only the best quality electrical components, along with patented circuitry, to maximize power and run time. They deliver the precise control and maximum performance top racers demand.

G-12c III adds new CoolSwitch circuit, TurboStart mode, more speeds for smoother operation, and PowerDrive motor interface. NEW anti-glitch software. The G-12c III is *Highest Amp-Flow* (torque) speed control made, for extra acceleration. 1997-8 World Champion.

The G-9 is the only SuperSonic bypassed speed control, for the extra regenerating power and run time to win the biggest races. 1996-7 World Champion. ROAR Champion. Fast for stock motors too.

SPEED EXTREME

The advanced generation G-10 speed control provides new levels of modern tuning performance.

Programmable read and set for all critical parameters, including throttle curve, drag brakes, neutral/brake, dual current limiters with timer. Easy operation, adjusts in seconds. Over 600,000 possible setups. Indicator lights advance as throttle is applied. GoldFET IIIb transistors improve handling with a low center of gravity. Replaceable power wires. Exclusive advanced internal circuitry handles the most rigorous racing and performance demands.



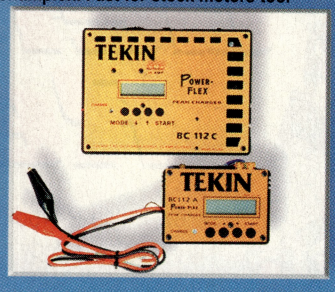
PEAK CHARGING

The BC5A or BC110L deliver reliable performance and rugged durability with todays demanding batteries. Unique adaptive peak sensing circuit delivers better charges and longer battery life by monitoring the charge profile. Easy to use. Cool, safe operation and complete overload protection. The BC110L DC charger handles 0-10 amps. The BC5A has a solid 0-6.5 amp AC/DC power supply built-in.



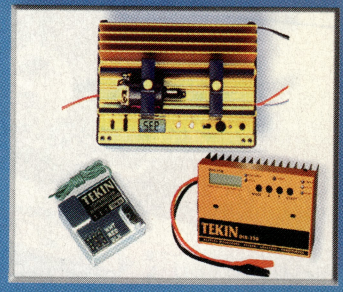
DIGITAL CHARGING

Custom LCD displays and microcomputer operation give you an inside picture to what the cells are doing. BC 48 is 0-8 Amp DC. BC 67 is AC/DC, with 5 Amp power supply built-in. Both feature 4 function LCD digital display, 3 charge profiles modes, and fully automatic operation. Reliable Adaptive Peak Sensing means your batteries are in safe hands. High performance Linear Current outputs for long, powerful runs. Gets you charged properly, reliably, and fast. 4-8 cells.



POWER-FLEX PRO CHARGING

The 112's deliver the best charge with Power-Flex circuitry that conditions the cells internally, so they produce more power with lower resistance, while also extending the battery life noticeably. Charges 1-12 cells, at up to 10 amps. LCD has 5 display modes, and 3 charge profiles with full settings. Connects to optional discharger for a complete high-end battery maintenance/test system. BC112A accepts 10-24volts DC. BC112C has a 24 volt, 10 amp AC/DC power supply built in. World Champion.



RADIO ACCESSORIES

AM and FM chrome micro receivers are super small and light, just 1.4" square, .45 ounce. Perfect for any vehicle. DYN900 motor dyno tests and tunes your motors to peak power. Works with stock or modified motors. Proprietary design has tuned World Champion motors. Digital LCD display. NEW DIS-350 battery Discharger/ Cycler to accurately rate cells. Use alone to discharge packs or cells, or with BC112 for complete cycling system. Portable. 0-30 amp output with adjustable settings and LCD display. 45 amp stress test mode.

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More Power...

With Reedy's R3K Nickel-Metal Hydride Panasonic 3000 cells, now available in an assembled Sport Pack!

#632 Reedy R3K Sport Pack
(Assembled Sport Pack, w/Tamiya type plug)



#636 Reedy R3K Ni-Mh
(Cycled, Matched, voltage treated, unassembled)

#637 Reedy R3K Ni-Mh World Cells
(Cycled, matched, voltage treated, unassembled... the top percentage of cells)



Ni-MH 3000's

NEW! SPORT PACK

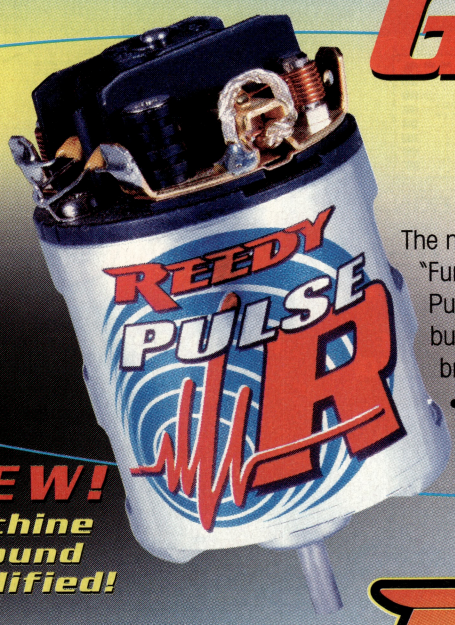


Less Cost...

The new CyberPack 1400 Ni-cd pack offers Reedy performance at an unbeatable price! If you're looking for a battery with the best power-to-bucks ratio, the CyberPack is your best choice!

#631CYBERPACK
(Assembled Sport Pack, w/Tamiya type plug)

Genuine Reedy!



NEW! Machine Wound Modified!

REEDY PULSE R

The new Pulse-R Modified motor is based on the latest "Fury" motor, Reedy's state-of-the-art modified. The Pulse-R is machine wound and features dual low-friction bushings, 5.2zM-Class high temperature magnets, Reedy's brush vibration-damping system, and a great, low price!

- Standup Brushes, Standard commutator
- New design vented can for improved cooling
- 10-14 turns available... Great for Touring Cars!

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STOCK RACERS... LRP now has an IPC just for YOU!

Stock Class Racers told us that they needed a speed control with a more "punchy" feeling... and we listened. The technicians at LRP have built the first speed control designed purely for Stock Racing... the IPC "SR". It combines the race-winning features of the legendary V6 with the feel that Stock racers love. Get the most speed and punch out of your stock motor with the new IPC SR!

IPC SR
#LRP8063

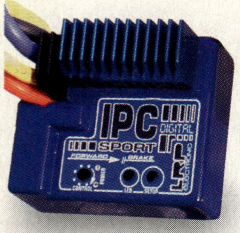
- **Extra Punch**
- **No Motor Limit**
- **Digital High-frequency**
- **Single-Button Setup w/LED**

It's TEAM ASSOCIATED'S PUNCH MACHINE!

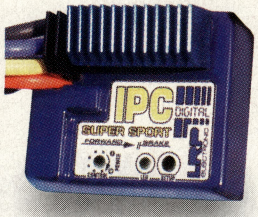
A Genuine IPC Digital for Every Racer's Budget...

Compare our PRICES to any other leading brand ESC's!

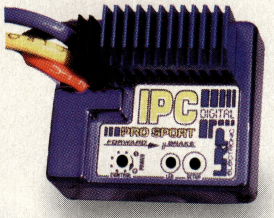
IPC Sport
#LRP8347
- 14-36 Turns Motor Limit
- Digital High-frequency
- 2-Stage Protection
- Plug-in and Drive
- Adjustable Current Limiter
- High-frequency, 1250Hz.
- Single-Button Setup w/LED



IPC Super Sport
#LRP8359
- 12-36 Turns Motor Limit
- Digital High-frequency
- 2-Stage Protection
- Plug-in and Drive
- Adjustable Current Limiter
- High-frequency, 2000Hz.
- Single-Button Setup w/LED



IPC Pro Sport
#LRP8362
- No motor Limit
- Digital High-frequency
- 2-Stage Protection
- Plug-in and Drive
- Adjustable Current Limiter
- High-frequency, 2500Hz.
- Single-Button Setup w/LED





- No Motor Limit
- Digital High-frequency
- 2-Stage Protection
- Super-sensitive brake
- Digital-Active Current Limiter
- Single-Button Setup w/LED

IPC V6
#LRP8068

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IFMAR OFF-ROAD

August 2 through 8: 1999 IFMAR Off-Road 4WD and 2WD World Championship—Rauma, Finland.

The IFMAR Off-Road World Championships is the highest echelon in off-road racing. To capture the title at this race proves that you truly are the best in your field. This year, racers from 19 countries from all over the world made the trip to Rauma, Finland to battle it out to see who was the best 4WD and 2WD racer.

The odds-on favorite from the United States going into the race had to be Team Losi/Trinity driver Brian Kinwald who recently dominated the ROAR Off-Road Modified Nationals only weeks prior. Another strong contender from the States was Team Associated's Mark Pavidis, who was already having a strong year, capturing wins at big races such as the Reedy Race of Champions, then backing that up with a strong showing at the Team Losi Florida Winterchamps event.

But, the man that most had their eye on though was Finland's own Jukka Steenari. The much-liked Finn was an odds-on favorite to do the most damage—everyone agreed that he would be very hard to beat in his home country. Jukka, who is considered a 4WD specialist by most, was long overdue for a big win like this—would this be his race? After finishing second overall in the 4WD class at the previous Worlds, he was definitely gunning for his first IFMAR title as well as the first title for Team Losi's XX4.

WORLDS

Racing action in Finland!









'99 IFMAR OFF-ROAD WORLDS

4WD Qualifying

Throughout qualifying, there was really only one person who stood out above the rest of the field—Team Losi/Orion driver Jukka Steenari. During the 4WD portion of the event, the Losi XX4 was the car to beat—eventually, there were eight out of ten Losi cars on the grid for the A-main. On the other end of the spectrum it appeared that previous World Champion Yokomo was having trouble getting their MX-4 hooked up. In the end, Jukka's dominance shone through as he TQ'd three out of five rounds (first, second, and fourth rounds) and captured the sought after pole position.

4WD

Qualifying order		Best time
TQ Jukka Steenari	12 laps	5:22.32
2 Brian Kinwald	12 laps	5:23.70
3 Mark Pavidis	12 laps	5:27.00
4 Teemu Leino	12 laps	5:27.04
5 Scott Brown	11 laps	5:1.72
6 Mark Francis	11 laps	5:1.02
7 Teppo Kauppinen	11 laps	5:3.07
8 Brian Dunbar	11 laps	5:1.65
9 Jimmy Jacobson	11 laps	5:0.09
10 Matt Francis	11 laps	5:2.01



A very, very happy man! Jukka breathes a sigh of relief after clinching the 4WD title after winning the second A-main, and then a little look of shock, realizing he'd finally done it!

4WD A-mains

• A1

TQ Jukka Steenari's Team Losi XX4 jumped out to an early lead followed by Mark Pavidis' Yokomo MX-4, with Brian Kinwald's Team Losi XX4 holding third. Early on, Kinwald's car got loose over the triples and fourth-place-qualifier Teemu Leino drove his Schumacher Cat 2000 past him into third place as Kinwald got his car collected. Kinwald then started applying pressure and looked to get past Leino. Out front Steenari had a decent lead (close to a full straightaway) over second-place Pavidis. Midway into the race, Kinwald's XX4 snapped a belt and he had to pull off. The two local Finnish drivers Teppo Kauppinen (Team Losi) and Leino began to battle for the third position. Towards the end it was Steenari finishing first with a good stretch over second place finisher Pavidis. Kauppinen ended up securing the third spot, while Jimmy Jacobson (Team Losi) moved his way up to fourth, Brian Dunbar finished fifth (Team Losi), Scott Brown took sixth (Team Losi), Leino finished seventh, Matt Francis placed eighth (Team Losi), his brother Mark placed ninth (Team Losi), while Kinwald DNFd. The fastest lap of the race was set by Teppo Kauppinen on lap 6 with a 26.55.

• A2

With one win under his belt, all Steenari had to do to claim the title was lead the pack to the finish again. Off the start Steenari got out to an early lead followed by Pavidis, while Jimmy was making his way up towards the front of the pack and staked a claim to the fourth position. Early on Steenari and Pavidis bobbleb over the triple and Kinwald slid by into the lead. Kinwald was running with a decent lead while Jacobson managed to move up into the second place spot. Kinwald ran into some trouble over the difficult triple section which allowed Jacobson by into the lead and while he was off the track Steenari moved up into second place. Jacobson pulled out a bit of a lead but Steenari started reeling him in. As the race started winding down on the last lap, Jacobson got a little loose over the triples and Steenari caught up to him and they drag-raced to the finish line. Steenari motored past like Jacobson was sitting still and went on to win his first IFMAR title for himself as well as the first IFMAR title for Team Losi's XX4 and Team Orion. A dejected Jacobson had to settle for second place behind his teammate while Kinwald took third place. Mark Francis moved into the fourth place position at the end and he was followed by Brown, Leino, his brother Matt while Dunbar, Kauppinen and Pavidis all did not finish. Jimmy Jacobson set the fastest lap during the race on lap 7 with a 26.37.

• A3

With 1999 IFMAR 4WD Champ Steenari sitting out of the third and final main, Kinwald jumped out to an early lead with Pavidis right behind him. Early on the two aggressively tangled and Jacobson inherited the lead and was followed by Leino, then Dunbar. Not long after getting into second place, Leino passed Jacobson for first. Kinwald and Pavidis quickly started working their way back towards the leaders as Dunbar dropped back in the pack. Up front Leino managed to stretch out a decent lead at which point Jacobson rolled his car and Kinwald and Pavidis went by for second and third place. Almost immediately Kinwald rolled it on the triples, and Pavidis and Jacobson got by, then Jacobson pulled



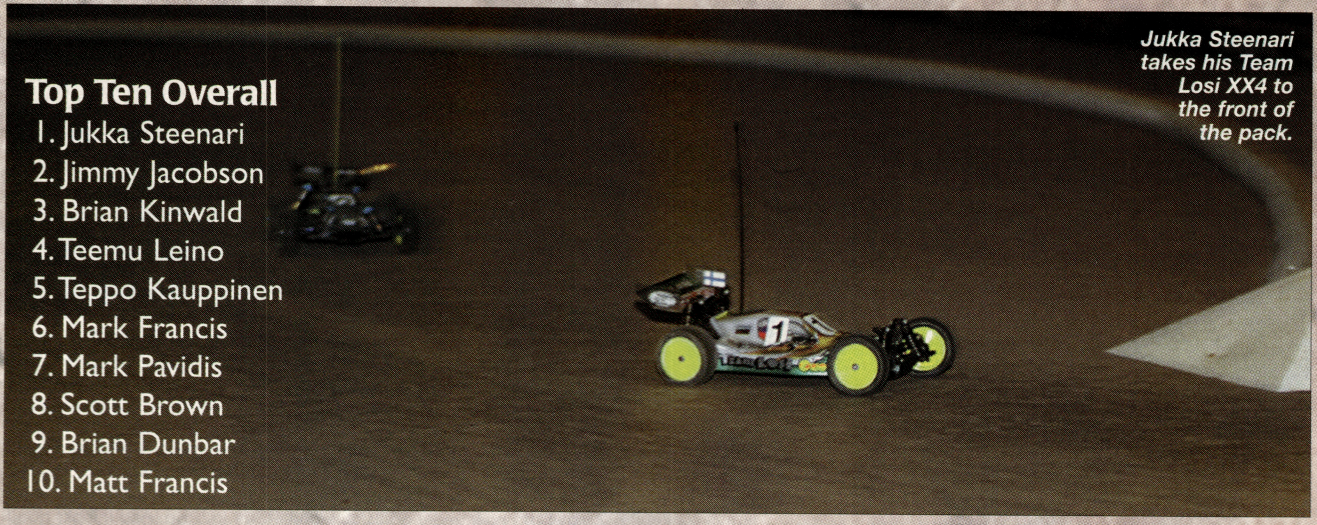
The Worlds track was absolutely huge! Most American racers were not quite used to a track of this size. A slow lap could be in the 30-second range!



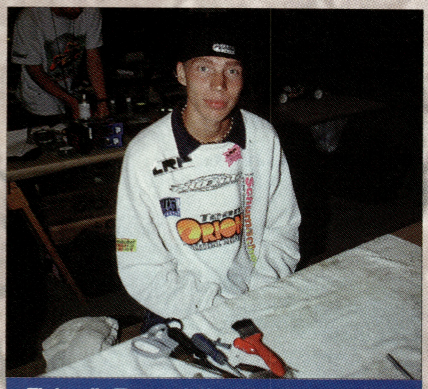
Team Orion worked very hard throughout the race and were rewarded with their first IFMAR Off-Road World Championship, thanks to their driver Jukka Steenari—congratulations goes out to Team Orion! And you can relax now—all your hard work finally paid off!

Top Ten Overall

1. Jukka Steenari
2. Jimmy Jacobson
3. Brian Kinwald
4. Teemu Leino
5. Teppo Kauppinen
6. Mark Francis
7. Mark Pavidis
8. Scott Brown
9. Brian Dunbar
10. Matt Francis



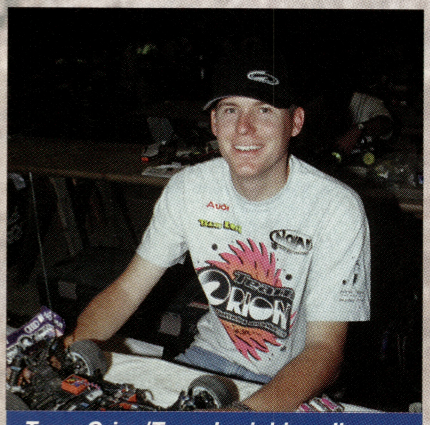
Jukka Steenari takes his Team Losi XX4 to the front of the pack.



Finland's Teemu Leino scored well in the 4WD class with his Schumacher CAT 2000 by winning the third and final A-main, and also managed to make it into the 2WD portion of the event.



Insert the Rocky theme music now... Jukka sprays down his teammate Jimmy Jacobson as third place finisher Brian Kinwald heads for higher ground to avoid being sprayed. Scott Hughes then suffers the wrath from Jimmy's champagne bottle while Jukka looks to give the crowd a little bath. Afterwards, the race director gave the homeland hero the mic to thank his family, friends, sponsors and fans for all their support.



Team Orion/Team Losi driver Jimmy Jacobson had the second 4WD main all but won until the very last lap when his teammate Steernari motored by for the win. Jimmy really looked strong at the Worlds—we're sure we can look for him to be a factor at all the races from here on.

past Pavidis entering the straightaway. Jacobson and Pavidis battled back and forth with Jacobson getting the better of the two until coming up to the triples again—he rolled it and Pavidis got by and so did Kinwald. Kinwald made a move on Pavidis and got past him for second place at the end. At the finish, Leino took the win followed by Kinwald, then Jacobson. Kauppinen worked his way up to the front for fourth overall, while Mark Francis placed fifth, Dunbar took sixth, Pavidis finished seventh, Brown placed eighth, while Matt Francis rounded out the top ten. The highlight of the race was towards the end when Matt Francis hit one of the pyramid track markers going into the large drivers' stand jump—his car went sky-high and it completely cleared and bypassed the four to five foot high jump! It was classic. The fastest lap during the race was set by Scott Brown on lap 5 with a 26.36. •

NEW KITS

RS4 PRO 2



#173 RS4 Pro 2 Kit (no body)

* *R/C Car magazine gives the Pro 2 an overall rating of Ten out of Ten. This is the highest rating yet given by R/C Car. (April 1999 issue)*
* *HPI Team Driver Masayuki Murai wins the Hong Kong International Touring Cup Championship using the RS4 Pro 2.*
* *Racers all over the world submitted their own success stories with their RS4 Pro 2 kits. Their testimonials are featured in HPI's advertisement in R/C Car Action magazine. (July 1999 issue)*

How do you improve on a car that won the 1998 R/C Car Action Car of the Year award? You listen to racers. The new RS4 Pro 2 is packed with the features that were suggested by HPI's Team Drivers and our web page visitors.

Our engineers gave the RS4 Pro 2 an all-new suspension that delivers better performance and increased tuning options. The efficiency of the 4WD drivetrain has been improved, making the Pro 2 even faster than the previous car. Everywhere you look on the car there have been refinements that make the Pro 2 faster, stronger, more adjustable and easier to drive. And it looks good!

Super NITRO RS4

OVER 20 INCHES LONG & ALMOST 10 INCHES WIDE!

HPI is extremely proud to announce the Super Nitro RS4 kits! Features include larger stance for extra stability, 4WD double wishbone suspension, "Super Size" slick tires on high impact nylon wheels, heavy-duty purple anodized chassis, and a removable radio tray for easier maintenance & cleaning. Also equipped with our powerful .15 size Nitro Star engine for quick acceleration and super speed! Step-up to "Super Size"!

#482 Ford F-150 Super Nitro RS4 Kit
#7509 Ford F-150 Body (WB 300mm)

#483 Alfa Romeo 156 Super Nitro RS4 Kit
#7510 Alfa Romeo 156 Body (WB 300mm)

20% BIGGER!

SUPER NITRO FEATURES:





#481 Dodge Viper GTS-R Super Nitro RS4 Kit
#7500 Dodge Viper GTS-R Body (WB 280mm)



Nitro Star .15FE engine



NEW!
#485 Lamborghini Diablo GT Super Nitro RS4 Kit
#7502 Lamborghini Diablo GT Body (WB 300mm)

RS4 MT

The RS4 MT has gone Off-Road! With the increasing popularity of the MT, HPI knew it was time to release a true off-road machine - the Baja Bug. Combine 3 stage dirt protection and the Dirt Hawg M2 Compound tires, and you can virtually ravage through any terrain! The RS4 MT features a dual belt 4WD system, long-stroke oil-filled shocks, a traction control slipper clutch, HPI 48 pitch gears, fiber reinforced nylon chassis and chrome Super Star wheels.







4WD OFF-ROAD!

#503 Baja Bug RS4 MT Kit
#7154 Baja Bug Body



Retractable antenna.
LED battery level indicators.
Servo reversing.
HPI TX-1 two channel pistol grip AM radio.
Efficient triple belt 4WD system.
Fuel tank with built-in primer.
Oil-filled coil-over shocks.
(2) SX-1 servos.
M-Compound Super Radial tires.
Powerful .15FE engine.
Tuned muffler.

RTR NITRO RS4 FEATURES:

Comes with a complete set of ball bearings.

#571 Ford F-150 Flareside RTR Kit
#7408 Ford F-150 Flareside Body

#572 Nissan Skyline R34 25GT RTR Kit
#7409 Nissan Skyline R34 25GT Body

NEW!
#575 Ford Taurus RTR Kit
#7417 Ford Taurus Body

#573 Alfa Romeo156 RTR Kit
#7410 Alfa Romeo 156 Body

#574 Dodge Viper GTS-R RTR Kit
#7419 Dodge Viper GTS-R Body

NITRO RS4
Ready To Run! RTR

HPI's RTR Nitro RS4 kit comes **preassembled** with the engine and radio equipment already installed! Now all those hours spent building a kit can be spent on the race tracks or thrashing around with your friends. The kit is equipped with a .15 size engine and a new tuned muffler for massive power, quick acceleration and amazing top speed! The hard part is choosing *which* of these RTR kits to get!

RS4 Rally

Polycarbonate upper & lower inner body.
Driver & co-driver figures.
New skid plate front bumper.
Rally tires.

Bridging the gap between touring cars and off-road buggies, the 4WD RS4 Rally is great for running on dirt, gravel or asphalt! Features include long-stroke oil-filled shocks, all-terrain rally tires on high impact nylon wheels, durable fiberglass dual-deck construction, full ball bearing set, carbon-fiber reinforced spur gear, and our proven dual belt drive system. Whether bashing around or racing, the RS4 Rally delivers high performance on any surface!

THREE NEW RALLY BODIES TO CHOOSE FROM!

#273 Toyota Corolla WRC Rally Kit*
#7400 Toyota Corolla WRC (200mm)

#275 Ford Focus WRC Rally Kit
#7412 Ford Focus WRC (200mm)

#274 Peugeot 206 WRC Rally Kit*
#7407 Peugeot 206 WRC (200mm)

*also available in a Nitro RS4 Tarmac Edition kit.

FOUR WHEEL DRIVE 4WD MAXIMUM TRACTION ON ANY SURFACE

Carbon fiber spur gear.
Belt tensioner.
Mini X-Pattern tires.
Quick change battery holders.
Super Shocks.
Graphite chassis.

RS4 MINI PRO

The RS4 Mini Pro kit features "Pro-level" parts which include a graphite chassis, graphite upper deck, front & rear ball diffs, universal dogbones, belt tensioner, Super Shocks, 4WD and sticky Mini X-Pattern radials.

NEW!
#298 Rover Mini Cooper Mini RS4 Pro Kit
#7206 Rover Mini Cooper Body

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'99 IFMAR OFF-ROAD WORLDS

2WD Qualifying

Early on it was apparent that Team Associated driver Mark Pavidis was the man to beat. His Reedy-powered Team Associated RC10B3 was consistently the fastest car on the track. In the early rounds it looked as if Team Associated was going to run away with the event as Team Losi looked to have some trouble dialing-in their new Triple-X. As the rounds went on, Team Losi started picking up the pace as team drivers experimented with new setup changes. At the end, though, it was Pavidis with his B3 TQing three out of the five rounds (first, fourth and fifth) to take the first place on the grid.

2WD

Qualifying order		Best time
TQ Mark Pavidis	12 laps	5m11.38
2 Brian Kinwald	12 laps	5m15.38
3 Masami Hirosaka	12 laps	5m11.91
4 Jason Ruona	12 laps	5m16.44
5 Rick Howhart	12 laps	5m17.24
6 Billy Easton	12 laps	5m12.71
7 Lloyd Dassonville	12 laps	5m14.89
8 Teemu Leino	12 laps	5m14.18
9 Jukka Steenari	12 laps	5m16.61
10 Jouko Termonen	12 laps	5m16.42



The first of the 2WD A-mains gets ready to kick off.

2WD A-mains

• A1

TQ Mark Pavidis' Team Associated RC10B3 didn't get the best start off the grid in the first main and it wasn't long into the race before third qualifier Masami Hirosaka of Japan took his Team Associated RC10B3 to the front of the pack. Rick Hohwart managed to get a fantastic start and put his new Team Losi Triple-X into second place. Not too long afterwards, Howhart took the lead from Masami, then Masami took it back shortly after. After regaining the lead, Masami checked out with over a straightaway lead—the battle the rest of the race was for second place. Jukka Steenari's Team Losi Triple-X inherited second place in the race after Howhart dropped back in the pack when he was passed by Hirosaka. Directly behind Steenari was TQ Pavidis, and he was beginning to apply pressure. Pavidis bobbled over the triples and it allowed Hohwart to gain ground on the front runners and he quickly set his sights on passing Steenari. With only a minute left to go, Hohwart pulled off a pass and took over second place and held off Steenari for second place until the very end. Masami crossed the line before time ran out and was all by himself on his 12-lap victory drive. Kinwald (Team Losi) finished fourth behind Steenari, Pavidis placed fifth, Billy Easton (Team Associated) finish sixth, Lloyd Dassonville (Team Associated) finished seventh, Teemu Leino (Team Schumacher) took eighth, Jouko Termonen (Privateer with an Associated RC10B3) placed ninth and Jason Ruona ran into technical problems early and DNF'd. The fastest lap of the race was set by Mark Pavidis with a 25.31 second run on lap 8.



How many World titles now, Mr. Reedy? With 19 under his belt, you have to call him Mister...

• A2

In one of the most exciting races of the day, Kinwald grabbed the holeshot and right behind him Pavidis and Hirosaka tangled which gave Kinwald a decent lead. Pavidis recovered as quickly as he could and started pressuring Kinwald. Pavidis tried to get around Kinwald but got momentarily hung up and Hirosaka got by into second. Hirosaka miscalculated a turn, got hung up, and Pavidis had nowhere to go but to hit his car. After that little mishap, Billy Easton moved into second place followed by Pavidis and Hohwart respectively. Pavidis managed to get back towards the front as the race wound down, and he started whittling away at Kinwald's lead. Towards the end, Pavidis closed the gap to only a few car lengths but couldn't find the clean line around Kinwald's car. Kinwald didn't get over the triples cleanly and Pavidis took advantage of the situation and motored on by. Kinwald quickly regained his composure and began charging towards the rear bumper of Pavidis. Soon afterwards, Pavidis got hung up on a pipe and Kinwald snuck by for the lead. From this point on, Pavidis followed Kinwald to the very end with only a few laps left. You could see that Pavidis was trying to put a wheel in anywhere he could get by with a clean pass. At the end (Kinwald and Pavidis were the only two to run 12 laps), Pavidis made a mistake and Kinwald crossed the line with a pretty decent lead. Billy Easton crossed the line in third place, followed by Steenari in fourth, Ruona placed fifth while Dassonville held down the sixth spot. Rounding out the top ten were Hirosaka with a seventh place finish, Termonen placed eighth, Leino finished ninth, and Hohwart took the tenth spot. Setting the fastest lap of the event was Mark Pavidis again with a 25.32 second run on lap 5.

• A3

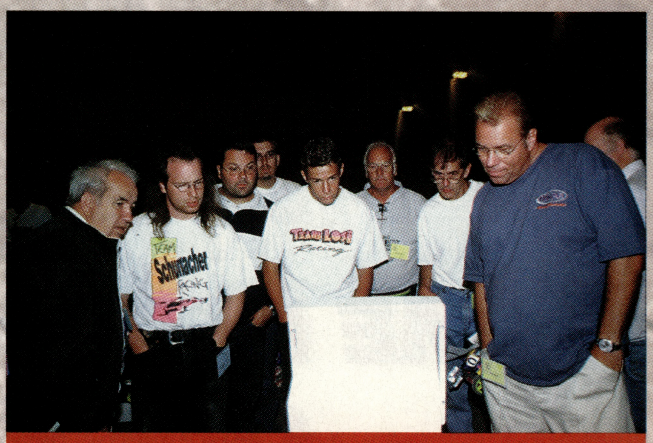
With one win for Hirosaka, a win for Kinwald, and a second place for Pavidis, it looked as if the win was going to go to whoever finished ahead of the other. Off the start Kinwald grabbed the holeshot, but in the turn entering the doubles only seconds later there was a controversial bit of contact between Kinwald and Pavidis with Pavidis getting the better of it. Kinwald was dropped to last place and found himself needing to work his way back towards the front of the pack. Pavidis got a little squirrely going into one of the turns and Hirosaka took advantage and moved into the lead. Pavidis dropped to second and was fol-



Not many at the track going into the 2WD A-mains figured Masami Hirosaka would be a threat to win especially considering the fact that in the past two years since the last off-road World Championship he only raced off-road a few times. Mark Pavidis was the first one to let loose the champagne on Masami as Kinwald struggled to open his bottle....it looks like Brian's still working on that bottle...



Richard Saxton sets down teammate Mark Pavidis' TQ RC10B3 on the starting grid. We were told after the race that Mark wasn't given the lane choice option that was available to the 4WD TQ and he felt that that could have been a deciding factor in the outcome of the race.

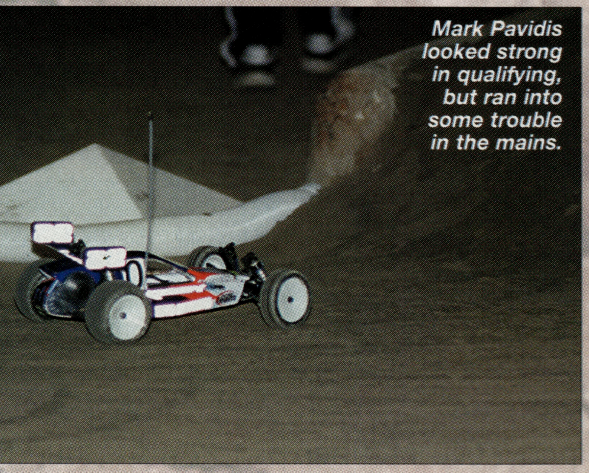


As qualifying went on, computers set up at two corners of the track displayed lap times on each driver racing. This was almost always the popular hang-out spot as the fast heats took their turn on the track. Trinity's Ernie Provetti (right), watches as his driver Brian Kinwald puts in some fast lap times with his new Triple-X.

lowed by Easton in third and Kinwald in fourth. Kinwald tried as hard as he could to get past Easton, and Pavidis and Easton tangled which lets Kinwald catch up a little closer. You could see that Kinwald was trying everything he could to get his car towards the front past Easton and Pavidis. Easton got a little out of shape and Kinwald made a pass on him but he immediately started getting pressure from Easton who wanted third place back. In the meantime, Hirosaka managed to develop a huge lead over second place—a flashback to the first A-main. Back in the pack Easton managed to get back past Kinwald after relentlessly pressuring him for a few laps. At the end, Kinwald and Easton tangled and then they both got held up and missed the last lap. On the 12th lap, Hirosaka held the lead to the end with Pavidis in second. Easton finished third overall, followed by a highly disappointed Kinwald in fourth. Termonen placed fifth while Steenari finished sixth, Ruona placed seventh, Leino eighth, Hohwart finished ninth, and Dassonville rounded out the top ten. Again, setting the fastest lap time of the event was Mark Pavidis on lap 6 with a 25.37 run. •

Top Ten Overall

1. Masami Hirosaka
2. Mark Pavidis
3. Brian Kinwald
4. Billy Easton
5. Jukka Steenari
6. Rick Hohwart
7. Jason Ruona
8. Jouko Termonen
9. Lloyd Dassonville
10. Teemu Leino



Mark Pavidis looked strong in qualifying, but ran into some trouble in the mains.

'99 IFMAR OFF-ROAD WORLDS

4WD

Fin	Qual'd	Driver	Country	Chassis	Motor	Battery	ESC	Receiver	Servo
1	1	Jukka Stennari	Finland	Losi XX4	TOP Orion 9x2	Orion V-Max	Novak Cyclone	Novak XXL	Sanwa EGR-ZR
2	9	Jimmy Jacobson	USA	Losi XX4	TOP Orion 9x2	Orion V-Max	Novak Cyclone	Novak XXL	Airtronics 257
3	2	Brian Kinwald	USA	Losi XX4	Trinity D3.5 10x2	Trinity VIS Extra	Novak Cyclone	Futaba R113F	Airtronics 452
4	4	Teemu Leino	Finland	Schum.	TOP Orion	Orion V-Max	LRP V7.1	LRP Phaser	Sanwa EGR-ZR
5	7	Teepo Kauppinen	Finland	Losi	TOP Orion 9x2	Orion V-Max	Novak Cyclone	Novak XXL	Sanwa ERG-ZR
6	6	Mark Francis	USA	Losi XX4	Trinity D3.5 10x2	Trinity VIS Extra	Novak Cyclone	Air. 92827	Air 157
7	3	Mark Pavidis	USA	Yokomo MX-4	Reedy Tri-Sonic 10x4	Reedy Zappers	LRP V7.1	LRP Phaser	Air 252
8	5	Scott Brown	USA	Losi XX4	Trinity D3.5 10x2	Trinity VIS Extra	Novak Cyclone	JR Racing R200	JR Racing Z4750
9	8	Brian Dunbar	USA	Losi XX4	GM EV03 10x3	GM Racing VIS	GM Racing V12	GM Racing R598	Air 257
10	10	Matt Francis	USA	Losi XX4	Trinity D3.5 10x2	Trinity VIS Extra	LRP V 7.1	LRP Phaser	Air 257

2WD

Fin	Qual'd	Driver	Country	Chassis	Motor	Battery	ESC	Receiver	Servo
1	3	Masami Hirosaka	Japan	Associated B3	Reedy Sonic2 9x2	Yokomo	GM Racing V12	KO ProPo	KO PS-200 FET
2	1	Mark Pavidis	USA	Associated B3	Reedy Sonic2 10x3	Reedy Zappers	LRP V7.1	LRP Phaser	Air 452
3	2	Brian Kinwald	USA	Losi Triple-X	Trinity D3.5 11x2	Trinity VIS Extra	Novak Cyclone	Novak XXL	Air 452
4	6	Billy Easton	USA	Associated B3	Reedy Sonic2 10x3	Reedy Zappers	LRP V7.1	LRP Phaser	Air 452
5	9	Jukka Steenari	Finland	Losi Triple-X	TOP Orion 12x2	Orion V-Max	Novak Cyclone	Novak XXL	Sanwa ERG-ZR
6	5	Rick Hohwart	USA	Losi Triple-X	TOP Peak 12x4	Peak Power-Flo	Novak Cyclone	Futaba R113F	Futaba 9450
7	4	Jason Ruona	USA	Associated B3	Reedy Sonic2 10x4	Reedy Zappers	LRP V7.1	LRP Phaser	Air 257
8	10	Jouko Termonen	Finland	Associated B3	TOP Peak 10x3	GM Racing VIS	Tekin G12	Sanwa	Air 151
9	7	Lloyd Dassonville	USA	Associated B3	Reedy Sonic 2 10x2	Reedy Zappers	LRP V7.1	Air 92837	Air 257
10	8	Teemu Leino	Finland	Schumacher	TOP Orion 10x2	Orion V-Max	LRP V7.1	LRP Phaser	Sanwa ERG-ZR

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We don't mind if you check out the sexy new bodies we've created for the Associated B3 buggy and T3 truck—people just notice a great looking body! For example, you've noticed these new ***"Speed Series"*** bodies from Deans (*and so will everybody else!*). You saw the innovative number plate on the buggy (*no more numbers on the windows!*). The realistic design of the truck, and its advanced aerodynamics got your attention (*we didn't even show you the trick tabbed spoiler!*). ***Get speed*** - get ***"Speed Series".***

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Radio	Charger	Front Tires	Rear Tires	Foam (F/R)	Gearing	Body
Sanwa M8	NovMil/Orion Pro	Losi Tapper Yellow	Losi Taper Pin Yellowlow	Trinity Da Bomb 2	17/86	Losi Hot Weather
Airtronics M8	Novak Millenium	Losi Tapper Yellow	Losi Taper Yellow	Trinity Da Bomb 2	17/86	Losi Hot Weather
Airtronics M8	Novak Millenium	Losi Taper Yellow	Losi Taper Yellow	Trinity Da Bomb 2	19/86	Losi Standard
Sanwa M8	Orion	Pro-LineHole-Shot M3	Pro-Line Hole-Shot M3	Pro-Line	17/92	Schumacher Standard
Sanwa M8	Orion	Losi Taper Yellow	Losi Taper Yellow	Trinity Da Bomb 2	17/84	Losi Standard
Airtronics 3PS	Novak Millenium	Losi Taper Pin Yellow	Losi Taper Pin Yellow	Trinity Da Bomb 2	19/84	Losi Standard
Air M8	Novak Millenium	Pro-Line HoleShot M3	Pro-Line HoleShot M3	Pro-Line White	18/84	Yokomo Standard
JR Racing R-1	Novak Millenium	Losi Taper Pin Yellow	Losi Taper Pin Yellow	Trinity Da Bomb 2	18/84	Losi Hot Weather
Air M8	GM VIS Comander	Losi Taper Pin Yellow	Losi Taper Pin Yellow	Trinity Da Bomb 2	18/84	Losi Standard
Air M8	LRP Quadra	Losi Taper Pin Yellow	Losi Taper Pin Yellow	Trinity Da Bomb 2	20/86	Losi Standard

Radio	Charger	Front Tires	Rear Tires	Foam (F/R)	Gearing	Body
KO Esprit Vantage	Yokomo PC-001	Pro-Line Radius Rib M3	Pro-Line Hole Shot M3	Pro-Line (gray/white)	16/81	Pro-Line Deja Vu
Air M8	Novak Millenium	Pro-Line Radius Rib M3	Pro-Line Square Fuzzies M3	Pro-Line (gray/white)	18/81	Pro-Line Deja Tu
Air M8	Comp. Elec T30	Losi Wide Body Red	Pro-Line Square Fuzzies M3	Trinity Da Bomb 2	20/78	Losi Standard
Air M8	Tekin 112A	Pro-Line Radius Rib M3	Pro-Line Square Fuzzies M3	Pro-Line (gray/white)	19/81	Pro-Line Deja Tu
Sanwa M8	NovMill/Orion Pro	Pro-Line Radius Rib M3	Losi X-2000 Yellow	Trinity Da Bomb 2	22/76	Losi Standard
Futaba 3PJ	Novak Millenium	Losi Wide Body Red	Pro-Line Hole Shot M3	Losi Firm	22/82	Losi Standard
Air M8	Novak Millenium	Pro-Line Radius Rib M3	Pro-Line Full Radius Rib M3	Pro-Line (gray/white)	19/81	Pro-Line Deja Tu
KO Mars EX1	Unknown	Pro-Line Radius Rib M3	Pro-Line Hole Shot M3	Pro-Line (gray/white)	20/81	Associated Standard
Air M8	Novak Millenium	Pro-Line Radius Rib M3	Pro-Line Hole Shot M3	Pro-Line (gray/white)	19/83	Pro-Line Deja Vu
Sanwa M8	Orion	Pro-Line Radius Rib M3	Pro-Line Hole Shot M3	Pro-Line (gray/white)	17/92	Schumacher Standard

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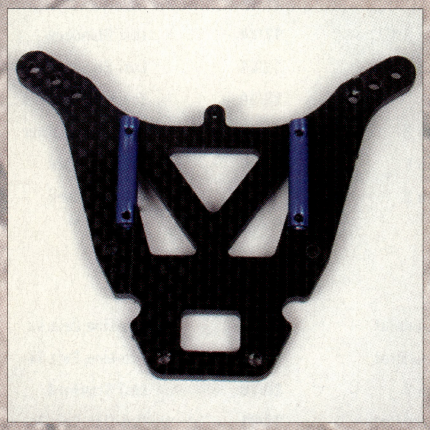
'99 IFMAR OFF-ROAD WORLDS

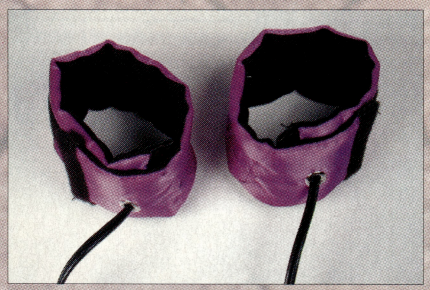
Instrumental Equipment

A lot of new equipment was introduced at the World Championship. The following are some of the new products(as well as a few familiar ones) that were used at the race.



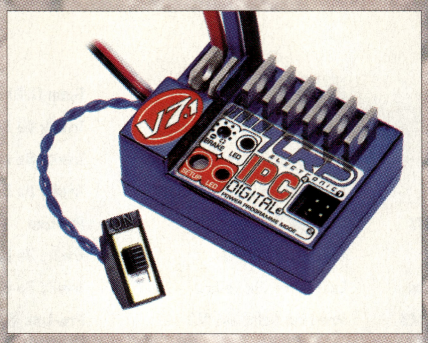
• Team Associated Rear Shock Tower

The only new item found on the Team Associated RC10B3 was this new rear shock tower. The new tower features revised rear geometry and is designed to fit the new Pro-Line low-profile body. The new tower allows you to mount the shocks farther out on top which suits today's higher grip, higher speed tracks. Whether or not they produce this for the kit was going to be determined by the results from the Worlds...we are only guessing that you can expect to see this in B3 kits sometime in the near future. Contact Team Associated at (714) 850-9342.



• Trinity Tire Warmers

Jukka Steenari, looking for any edge over the competition, tried out this set of Trinity tire warmers during qualifying in the 2WD portion of the event. When asked about the warmers, Jukka told us he wasn't sure if they helped because he also had changed a few things on his car setup at the same time. Still, he felt that warming the tires before the run might help get more grip on the track surface than just going out cold. We've seen it done in F1 and touring car racing before with good results—will this be the hot setup in off-road now too? Contact Trinity Products for more information at (732) 635-1600.



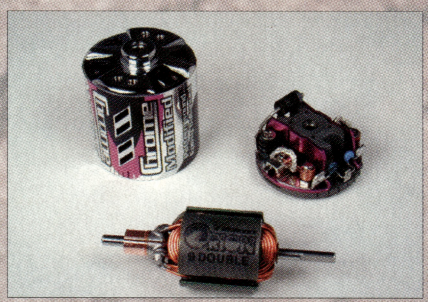
• LRP V7.1

The IPC V7.1 is based on the legendary IPC V6 with the following improvements: It has new 7.1 software, gives increased run-time and increased motor power, and has stronger and more consistent brakes. There is no receiver pack required down to 4 cells. The V7.1 will be available at the beginning of October in your local hobby shop. Pricing is the same as the IPC-V6. For more information, contact LRP's distributor Associated Electrics at (714) 850-9342.



• Team Losi Tires

Team Losi came prepared for the Worlds with a brand-new sticky Yellow compound Taper Pin tire. Over at the factory they have a brand-new tire chemist working on all-new compounds with Gil Losi Jr. almost daily. According to Team Losi, they've done more work on tire compounds in the past six weeks than they have in the past six years! Team Losi informed us to stay tuned—expect great things to come from them. Contact Team Losi at (909) 465-9728.



• Orion Chrome Modified

Orion's new Chrome Modified motor was the choice for 4WD Modified Champion Jukka Steenari. Jukka used a 9-turn double to take the victory, prepped by motor designer Oscar Jansen and Team Orion's Darren Westman. We'll have a full report on this new motor soon! (949) 864-1720.

Pro-Line Tires

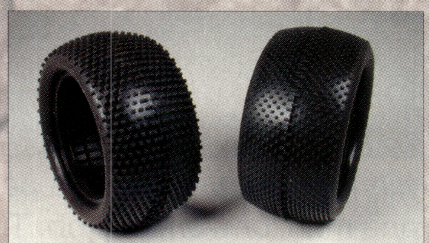
Pro-Line developed a few new tires for the IFMAR Off-Road Worlds, and also showed up with a few familiar faces as well...



•The new "Slash" buggy rear and 4WD front series of tires were designed specifically for hard packed tracks with dust and outside racing line debris build-up. They combine small pin and the separation design of their current tires with newly developed angled and slotted bar side bite technology. According to Pro-Line their "newly designed reinforced interior webbing with low-profile sidewalls and a redesigned carcass provide revolutionary support to these extraordinary tires."



Pro-Line also had three new front buggy tires at the race: Wide 4-Rib, Blade front, and the Radius Rib. The Wide 4-Rib is designed for loamy and dusty hard packed tracks, while the Blade front was made for high-bite blue-grooved tracks. The most popular tire used at the event was the new Radius Rib. The Radius Rib is also designed for high-bite blue grooved tracks, but features a new pre-broken in blue-groove, high steering radius rib to gain maximum traction.



As for rear tires, almost all the drivers in the 2WD A-main used Pro-Line Hole Shots or Square Fuzzies in M3 compound. (909) 849-9781.

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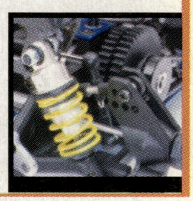
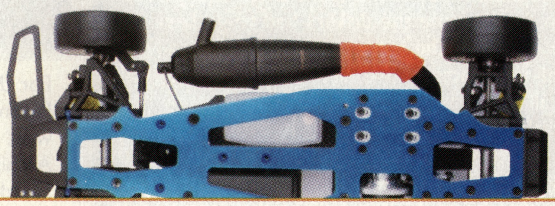


Horgae Scales wins the Canadian ROAR National Championship with Maximum Nitro!



If you're into pounding the pavement and laying down some serious power then look no farther! Golden Horizons has two new cars just for you. The new nitro sedan, aptly named the **Maximum Nitro**, features an innovative triple-belt design that minimizes power-robbing friction and efficiently transfers the power to all four corners of the car.

Obviously a kit like this comes with full ball bearings and ball diffs in the nose and tail, but the **Maximum Nitro also comes with several other features not found on comparatively priced kits.** Features like: a specially designed fuel tank that all but eliminates "foaming," a built in adjustable belt tensioner, center point steering, graphite shock towers, upper deck, 2.5mm thick 6061 blue anodized aluminum chassis, molded plastic receiver and battery compartments, foam bumper and CVD's all around!

See for yourself what maximum performance is all about! See Golden Horizons' **Maximum Nitro** at your local dealer, have them call Golden Horizons or check out our website for details!

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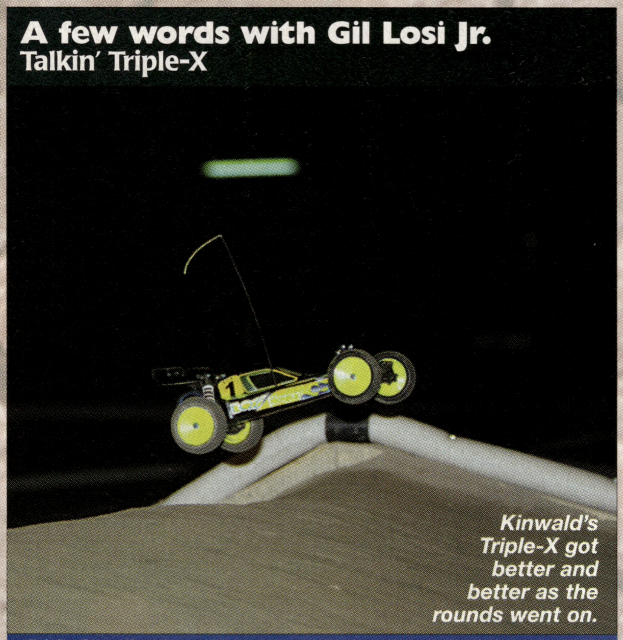
'99 IFMAR OFF-ROAD WORLDS

A few words with Gil Losi Jr.
Talkin' Triple-X



Kinwald's Triple-X got better and better as the rounds went on.

R/C Car: So Jr., after dominating the ROAR Nationals so convincingly with the Triple-X, it appeared you got off to a slow start at the Worlds with the car. Were you struggling with setups?

Gil Losi Jr: Well, we got the car on the track and it had just a general twitchy, "hard to get any kind of a driver feel for the car" action. During the first couple of runs we had to abandon our tires and setup tricks that we thought would work and go back to all the standard tires and setup stuff that we knew from home. We still really didn't have much of an improvement, though. Unfortunately, we pretty much wasted the first day doing all that stuff. Then on the first day of qualifying we started understanding ride height for this car on such a big track which is an important factor.

Halfway through qualifying we started lightening up the shock damping and all of the sudden the cars started getting good. But by that time we were in the fourth round of qualifying already, and most of the team didn't change their cars until then. At this time the drivers had to go back and re-setup their cars with the softer suspension. Basically we had to undo all the "damage" we had done.

Of course, all that was guesswork—we didn't truly have any time to dial the car in completely. In the mains, Jukka went back to our tires and liked them very much, but with Brian and Rick so high up on the grid, we didn't dare change their setup at that point. By the end of the race people could see how much more rear traction our cars had than any other cars in the main. Unfortunately, it's just one of those things…when we had a hard time getting balance with our old car, the Double-X, we would run the damping heavy and that worked. Our instincts from our old car led us in the wrong direction with the new car. In the end though I feel we were as fast as anyone, but we had more traction. If we had the opportunity to run this setup in practice from the get-go, we would have been able to tune more speed with tires, springs, etc. It was a lot of guesswork—if you start close to the right setup it's a big advantage over having to guess at setups—all the things we learned there we brought home, tested here, and have changed the setup in the kit so the car out of the box is even better than the car that won the Nationals. So even though we didn't win, we feel we learned a lot. ●



Team Losi scored big and hooked up with Audi for sponsorship of the event. Audi set up Team Losi with a few cars like this one to travel back and forth while visiting Finland. Team drivers were seen sporting Audi hats in the pits and stickers on their R/C Cars—very cool!

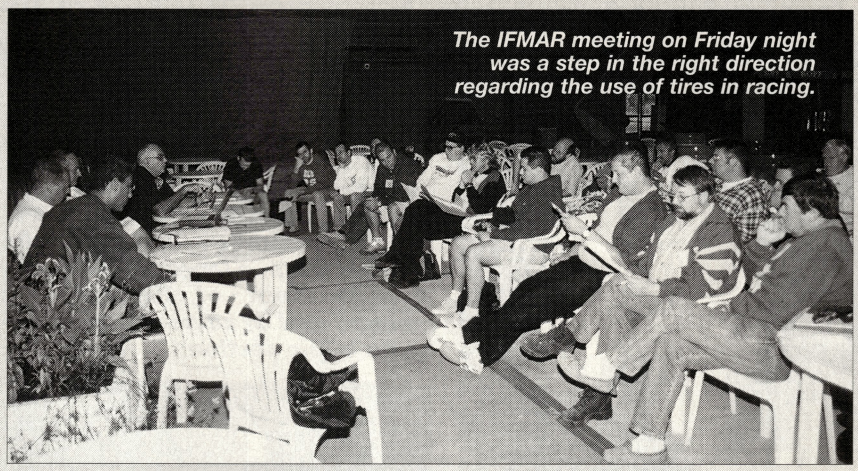
Rauma Finland—
Just where is it and what's it like?



For those of you that were wondering just where the heck Rauma, Finland is, it is located in the southern region of the country on the west coast. Rauma is a coastal community—its shores touch the Archipelago sea. Northwest of the country capital, Helsinki, the Nordic wooden town of Rauma is alive with culture and is rich in history. Old Rauma (the town is split into New Rauma and Old Rauma) has been an inspiration to artists and artisans throughout history—lacemakers, painters, sculptors, goldsmiths, potters, etc. have all made fine works throughout time that are now displayed in different events, galleries, and shops in the town. Old Rauma is also a thriving business district with over 200 unique stores and different shops. Rauma is also well-known for the lace it produces—as a matter of fact, the town even has a traditional Lace Week. Many cultural events are held in Old Rauma over the summer—the traditional Lace Week, Black Lace Night, the music event Festivo, the wine culture days, and many national and international art event. Rauma is a beautiful, cultured city, as is most of Finland, and it is rich in culture. But, as most of the American racers can attest, the town also hosts another beauty—the women! Most racers agreed that nowhere else have they seen such a group of beautiful girls all in one place. We have a feeling that not all were as homesick as we thought…●

IFMAR Spec Tire Proposal

The following is an open letter and proposal to IFMAR and its Member Blocks that was passed around during the race. A follow-up open meeting was held on Friday night after 2WD practice to discuss matters at hand. We here at *R/C Car* magazine support the basic principle behind the idea that was presented in the letter—if you agree, disagree, or otherwise have any input you'd like to give on the subject, please be sure to contact your ROAR representative and voice your opinion (see phone number below).



The IFMAR meeting on Friday night was a step in the right direction regarding the use of tires in racing.

"The time has come to open our eyes to the realities of racing at major national and international events and the direction it is leading the sport. Perhaps the single most costly and most critical area of concern in R/C racing today is that of tires. At any given event the competitor is forced to bring any number of different tread designs that is multiplied by the various compounds that each tread design is available in. This number is multiplied again by the numerous types and ways in which foam inner-liners can be used. The number of potential combinations is simply staggering. But wait, this is only the beginning. After the competitor has made a decision on what combination of tire, compound, and foam to race with, he has to make sure he has enough of all these pieces to run the event. Please consider the following example. A racer in 2WD brings four rear tread designs in two compounds each and three types of foam inner-liners. This same racer also brings only two front tread designs in two compounds each with only two types of foam. To insure he has a minimum of six sets of rears and three sets of fronts in the desired combination he must bring 168 pairs of tires. If the same racer wishes to race 4WD he must bring an additional 288 pair of tires or a total of 456 pairs of tires. Granted, he will not use all these but this is a very conservative evaluation of what he must bring to the event (@ 150 entries = 68,400 pairs). Another major concern is the fact that special tires and compounds are often used at these important events that are not available to all of the competitors. So the 456 or more pair of tires that were brought to the race were a waste of time and money since the best tires were not even available.

The cure for this problem is really quite simple. At the IFMAR IWC Championships held in the UK last year, a single spec tire was mandated and used for the competition with great success. The tires used were available to all competitors months prior to the event. This allowed each driver to learn the characteristics of the tire and the effects of various types of foam prior to attending the event. Having had the opportunity to complete his testing the racer is able to maximize the limited practice/test time available during the actual competition. In addition to not being forced to bring hundreds of pairs of tires, never knowing for sure if he really had the best combination of tread design/compound/foam, or realizing/wondering if the best tires were even available, the racer knows he competed on a level playing field.

The highest, most sophisticated levels of auto racing have all evolved to a spec or limited tire environment. If it works for the most sophisticated forms of racing it will work for R/C racing. If we do not take action we will continue to lose participation and support from racers as well as manufacturers. We would like to offer the following criteria for the use of spec tires. These suggestions can be modified or enhanced as necessary. We strongly urge IFMAR and its member blocks to adapt a unified approach to this problem immediately. Those of you reading this are among the leaders and supporters of this hobby. It is your responsibility to take action for its continued well being. Please don't wait until it's too late.

Suggested minimum criteria for spec tires

1. A single manufacturer will supply a single tire with a special "molded-in" marking for the event. Separate manufacturers may be used when different front and rear tires are used.

2. The organizer will mark the tire with a unique hot "brand" that can not be duplicated.

3. The tire chosen for an event must be readily and commercially available at least six months prior to the event.

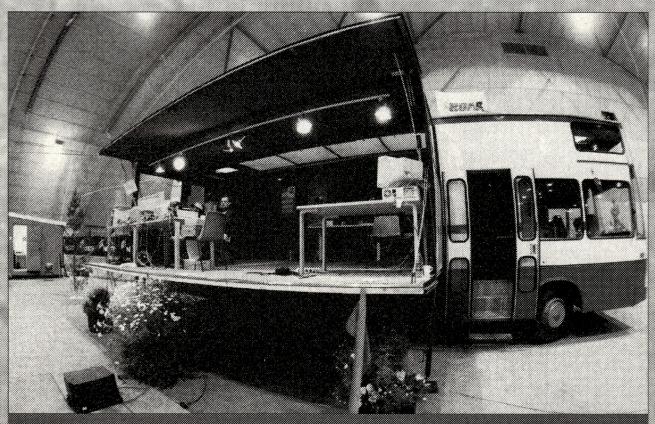
4. All tires supplied to the organizer of an event will be produced from the same batch of raw material.

5. A limited and equal quantities of tires will be allowed. Each competitors mounted tires will be permanently marked and recorded at tech. No sharing of tires will be allowed.

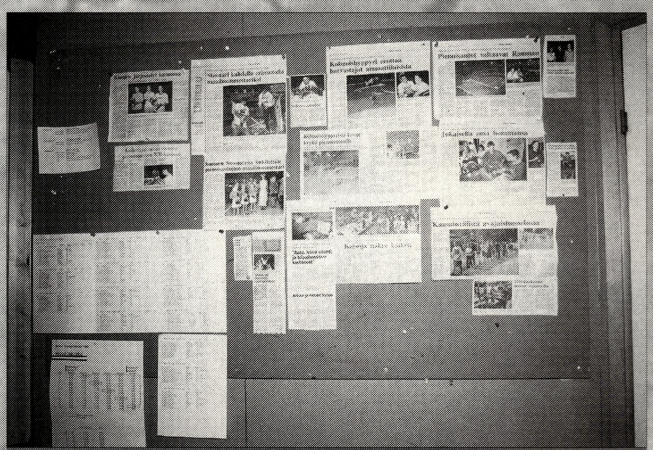
6. The quantity and type of tire to be used at an event will be determined by the organizer and a panel of drivers appointed by IFMAR and approved by a majority of the member blocks.

7. Any competitor or manufacturer found to be cheating will be barred from all future IFMAR events.

Contact ROAR: Fred Hohwart, ROAR Administrator: phone (949) 494-0515; fax (949) 494-3413 ●



Race control! This race headquarters "bus" was the temporary home of race director Ilkka Mannio and Rob Nelson, who was kept busy handling all the scoring and lap counting duties.



Daily updates from the race could be found in the local newspaper which was then posted on the bulletin board every morning for everyone to check out.

'99 IFMAR OFF-ROAD WORLDS



Finnish local Teppo Kauppinen surprised a few people at the race by being consistently fast enough to make it into the 4WD A-main event. Where do these Finns get their speed from? From what we were told, there really isn't any "local" racing for these guys to keep on top of their game...it must be in the water..

• The Umihalli racing arena was built in the early '80s and races have been held there regularly since 1987. Apart from Finnish races, the arena also hosted the European championship in 1995-the champs that year were Craig Drescher from the UK and Jukka Steenari of Finland. Beside R/C racing, the hall is also used for soccer games, Finnish baseball, golf, track and field, archery, fairs, concerts and exhibitions.



You're looking at the most common form of transportation in Rauma—it seemed everywhere we looked there was someone riding a bike around town.

• The track for the World Championship was 212 meters long, with 3-meter-wide lanes. The track was changed subtly in between the 4WD and 2WD program. Each layout featured a long back straightaway with many technical chicanes, a small double jump, a large semi-tabletop in front of the drivers stands, and of course, the notorious triple section.

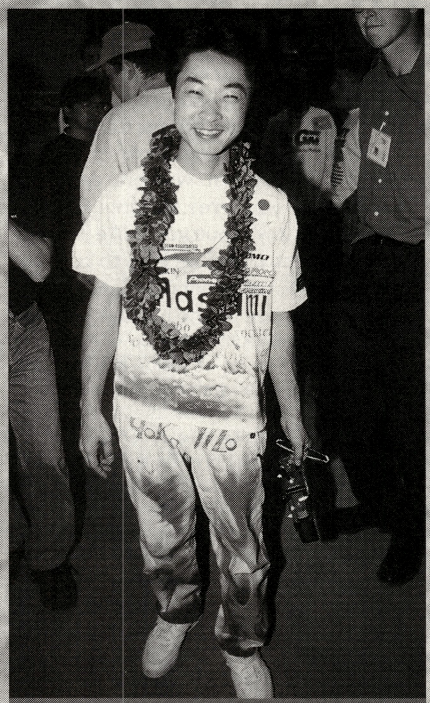


Rally car racer Richard Saxton and his mechanic Regan were spotted out on the town one night checking out the local action. Saxton is one of the funniest guys we've ever met—we're sure most of the locals he ran into would agree too!

• 19 countries participated at this years World Championship–the most ever!

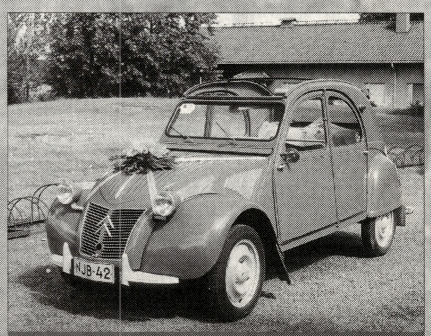


IFMAR President John Grant presents Jukka Steenari his 4WD Championship trophy at the awards banquet after the race.



Team Yokomo driver Masami Hirosaka shocked the R/C world by winning the 2WD portion of the event—he's only raced off-road a few times since the '97 Worlds in Pomona, CA!

• Most racers were surprised at how consistently fast the Finnish drivers were. With no permanent off-road facilities to race at year round in Finland, the contestants were seen scratching their heads, wondering how they got so fast! Finnish drivers Jukka Steenari, Teemu Leino made both finals, while Teppo Kauppinen scored well in the 4WD A-main program, and the 17-year old privateer Jouko Termonen surprised everyone by placing his Team Associated B3 in the 2WD A-main! After his second qualifying run, Jouko caught the eye of Orion who offered him some factory support by supplying him with batteries.



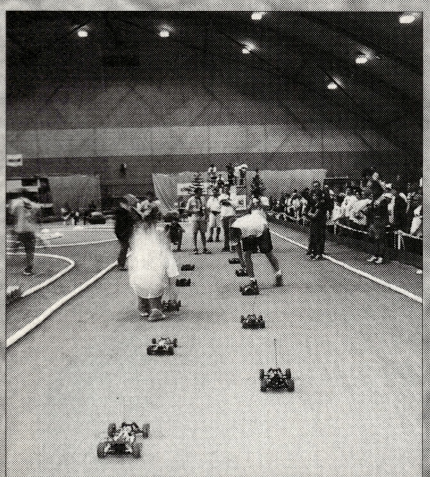
Saxton's next victim...

• The technical inspector voted our own Derek Furutani's Losi XX4 body the best looking in the building. Furutani, who also won the 4WD B-main got a nice-looking trophy for his efforts and also got a special greeting from Miss Lace of Rauma.

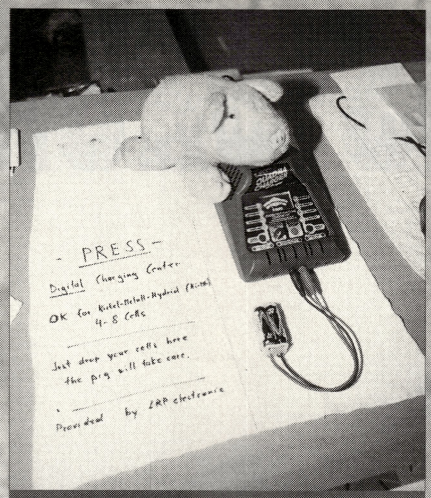


So let me tell ya a story about a man named Ted, a poor R/C racer tryin' to keep his A-main hopes fed. And then one day while leavin' from the track, Jukka told him somethin' 'bout a really big bike rack...chrome that is, holds stuff, weighs the bike down. So the next thing ya know old Ted's got room to spare, friends askin' him "hey, can I put my cars in there"... They said Rauma is the place you wanna be, so he packed up his stuff and moved from Helsinki...Finland that is...seafood...pretty girls...

• Anal-retentive drivers could tune into channel 17 at the local hotels to receive updates for evening's upcoming events.

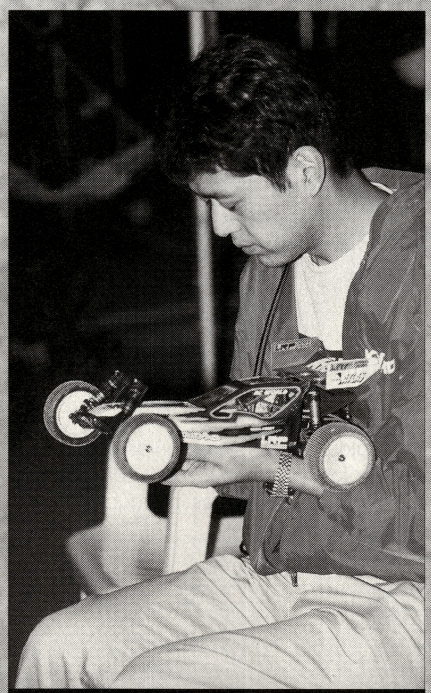


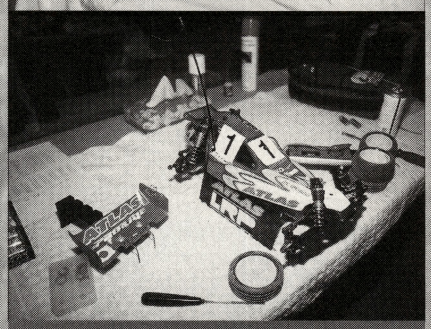
A view from the back of the pack as the grid is being set—long way to the first turn, isn't it?!



A big thanks goes to Jurgen Lautenbach of LRP and his pig for helping all the press with his digital charging station—without him, our cameras would be dead.

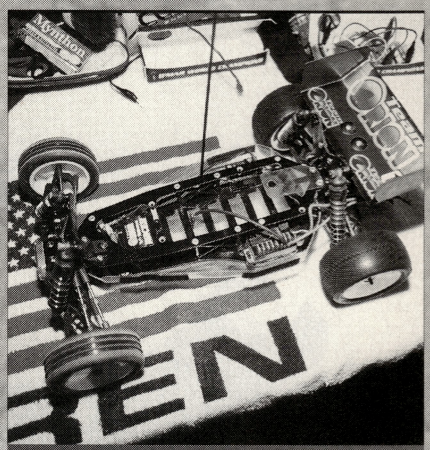
• Mark Pavidis turned the fastest lap of the event with a 25.29 second run.





Team Kyosho is getting back into off-road in a serious way! They showed up at the Worlds with an all-new 2WD buggy that turned a few heads.

• Team Audi sponsored Team Losi for the event and offered them a few cars for the event. Losi drivers could be seen sporting Audi hats and stickers on their cars in the pits during the event.



Schumacher brought out their revised Fireblade 2WD buggy and were met with great success. This is the 2WD Teemu Leino raced in the A-main with.

• Track manager Jouko Kantanen's computer revealed that 45,000 laps were driven, 7600 kilometers covered, and 8100 amp hours of electricity were spent!



Jukka Steenari tries out a set of Trinity electric tire warmers on his Team Losi Triple-X buggy before the track started coming up in the fourth round of 2WD qualifying.

• The most popular mode of transportation around Rauma are bicycles. Out in front of most establishments you'll easily see a dozen or so bikes lined up in front. We can understand why—it costs anywhere from $30-50 to fill up an average car's gas tank... ◆

HITEC HS-925MG & HS-



You probably spend a great deal of time thinking about the thickness of your car's shock oil, the operating frequency of your microprocessor-controlled ESC and the density of your tires' foam inserts, but when was the last time you gave serious consideration to the performance of your servos? Probably never. But you should.

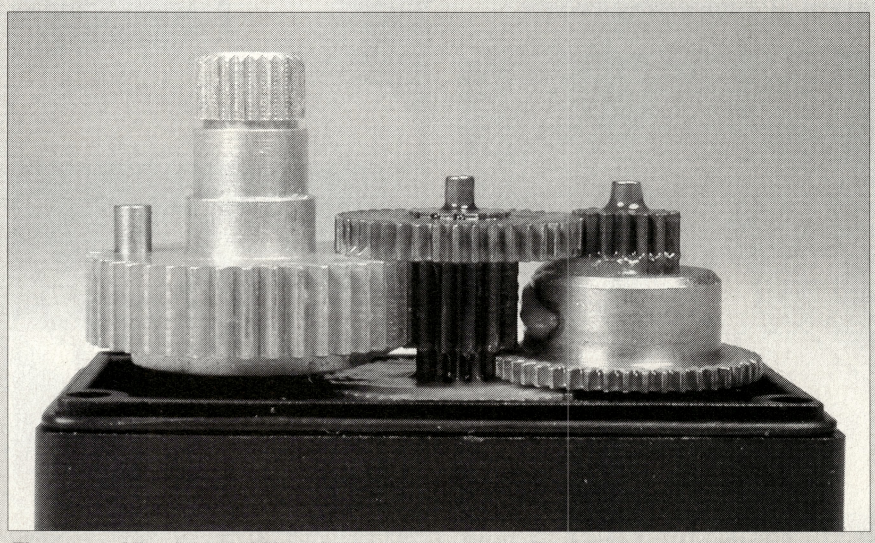
Think of your transmitter as the brain and the receiver as the nervous system. The servos are the muscles that—controlled by the nervous system—carry out the brain's commands to create motion and force. Weak or slow muscles aren't very good for moving heavy objects and generating quick reflexes—and they can get sand kicked in your face at the beach! Conversely, strong, quick muscles are what allow athletes to excel in their sport.

The same holds true for the servos in your R/C car or truck. Strong and fast servos do a much better job of translating your commands into motion. Fast servos let you steer quickly around potential hazards, while servos with a lot of torque (strength) keep your car's wheels pointed where you want them and provide better throttle control and stronger braking in nitro cars.

Hitec has earned a reputation for offering high-quality R/C radios, receivers and servos at prices that are lower than most of its competitors. Over the years, Hitec has introduced such products that cover nearly every market niche, from budget-priced AM radio systems (the Lynx) to high-end, multi-model memory FM computer radio systems (the Lynx 3D). Despite all this, however, Hitec has never truly offered an ultra-high performance line of servos. Sure, there have been very good Hitec servos for most applications, but nothing that truly competes with the best and most expensive servos from the Japanese and German manufacturers—until now!

Heavy metal!

Hitec's new HS925MG High Speed and HS945MG High Torque servos revolutionary for Hitec and for the R/C industry as they are the first high-performance servos to have an entirely metal gear train (brass gears with an aluminum output and idler gear). Other metal gear servos have at least one nylon gear that protects the servo's electronics by failing under extremely high stress—sort of like a "weak link" in the chain. These types of servos are much less likely to experience gear failure than nylon-gear-only servos, but under certain circumstances, they can break that lone nylon gear. Hitec is so confident in the integrity of the new servos' electronics and motor, that it is willing to forego this "safety" feature. As a result, the 925 and 945 will virtually never, ever strip or break a gear.



First gear: Hitec's new 925 and 945 servos are the first to offer an entire metal gear-train, using a combination of aluminum idler and output gears and a brass counter gear.

945MG SERVOS

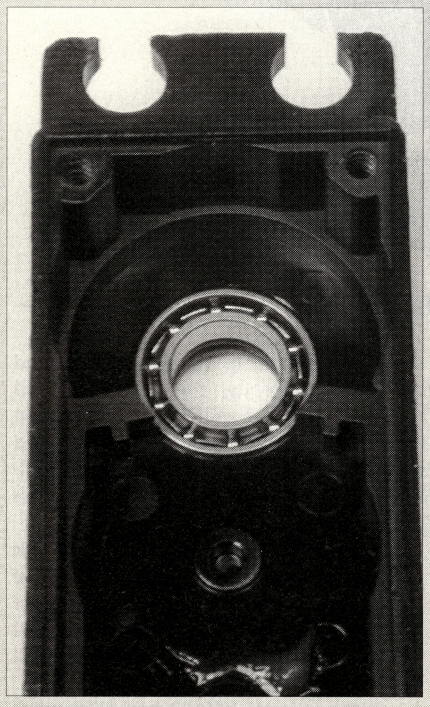
Hitec muscles into the high-performance servo market!



Hitec includes an assortment of nylon servo horns with each servo. Our personal favorite is the new "heavy duty" T-horn (center) that is virtually flex-free.

Hardcore

The key to the 925 and 945's impressive performance lies in its coreless motor design. What's a coreless motor, you ask? A typical electric motor uses a wound-coil armature that rotates within a stationary magnet. Brushes are used to maintain contact between the rotating armature and the power supply. In a coreless motor, the rotating armature is the magnet, with a stationary wound-coil on the outside. Since a coreless motor has no need for brushes, it can be made smaller and requires less "starting" voltage (which makes the motor more efficient). And because it has no brushes, there are fewer parts to wear out.



The servos' main gear is supported by a pair of ball-bearings for increased precision and longer life before servo-slop occurs.

The specs

Although the 925 and 945 are essentially the same servo, differences in gearing account for substantial changes in output torque and speed between the two. Here are the numbers (Note that information is provided for both 4.8V and 6V. This is because the BEC of most ESCs is limited to 4.8V, while it's possible to achieve higher voltage when using a separate battery pack, as with a nitro-powered car or truck).

HS-925MG High Speed

Speed to 60° @ 4.8V—0.11 second
Speed to 60° @ 6V—0.08 second
Torque @ 4.8V—83oz/in
Torque @ 6V—103oz/in
Case size—1.55x0.78x1.48in
Weight—1.97oz
Price—$149.95

HS-945MG High Torque

Speed to 60° @ 4.8V—0.15 second
Speed to 60° @ 6V—0.12 second
Torque @ 4.8V—122 oz./in.
Torque @ 6V—153 oz./in.
Case size—1.55x0.78x1.48 in.
Weight—1.97 oz.
Price—$149.95

Real life testing

We had the opportunity to run the 925MG High Speed servo in this month's test of the new Team Losi Triple-X buggy. We have to admit that in the past, we have noticed a difference in speed and centering strength between Hitec's previous "top line" servos and those of other manufacturers—no matter what the specs said, the feel was never quite the same. With the new coreless 925, however, the first thing we noticed—besides how lightning fast it is—was how well it snapped back to its center position—at least as good as any other servo we've tested (and better than some).

The holding power of the new Hitec 925 is really impressive, with absolutely no noticeable deflection during high-speed, bumpy sweepers, rutted 90-degree turns, and when landing nose-first off of big double-jumps. Most importantly—for us, anyway—was that the 925 provides "flickable" steering response. We'll explain: sometimes, especially when a tight turn follows a jump, you have a tendency to misjudge the turn's entrance. A very fast and powerful steering servo allows you to "flick" the wheels away from the turn's pipe or board without causing the car to lose too much speed. Otherwise, you must slow considerably and drive wide arcs to avoid getting hung up on the corner board or pipe.

Conclusion

With the release of the 925 and 945 servos, Hitec has once again proven that it can produce high-performance products for a lower price without any noticeable compromises in quality or performance. How Hitec can manage this feat is a mystery, but it's certainly no secret that these new servos will find their way into many, many racers' cars and trucks...and nitro buggies...and touring cars... ◆

SOURCES

Hitec, 12115 Paine St., Poway, CA92064 • phone (858) 748-6948; fax (858) 748-1767



Tamiya M03 Mini

From mild-mannered to pint-sized bruiser!

Since building our "home-brew" touring car test track, I've been running my Tamiya M03 Mini Cooper quite a bit. To many people's surprise, it's been holding its own on our tight, twisty, technical track against most of the other touring cars being raced. In the past, the words "smooth-handling" and "easy to drive" weren't the first words that sprang to mind regarding most Tamiya Minis.

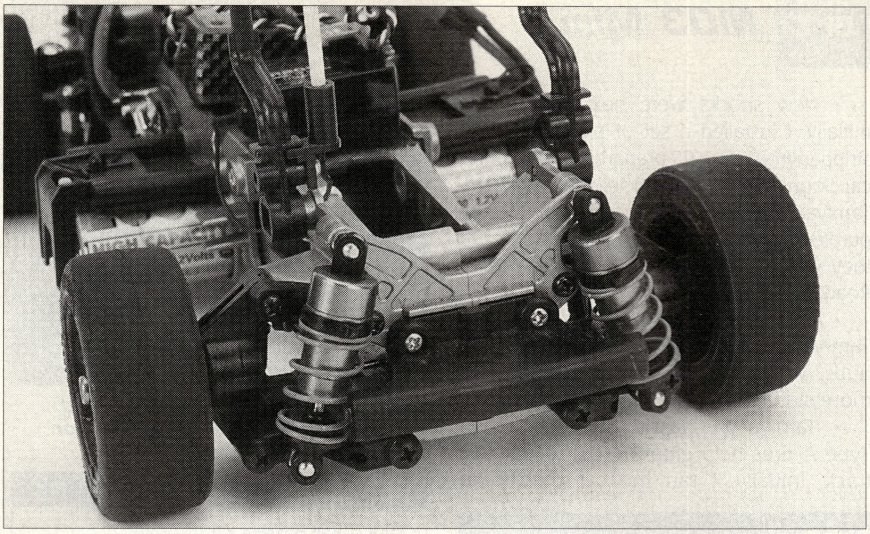
As a matter of fact, most Tamiya Minis over the years have been a little on the twitchy side to say the least. Well, that has all changed with the M03. I can honestly say that with a few modifications, the M03 can carve some pretty decent lap times while still retaining its "mini status."

I shall call him "Mini-3"

As you may recall in my last M03 article (*R/C Car* January '99), I ran into a few problems after my initial test–drivetrain problems, to be more specific. The bushings in the gearbox didn't quite keep things rolling as smoothly as they should have. For some reason, the metal shaft holding the spur/counter gear in place heated up and melted down through the plastic, which in turn destroyed the gears. I quickly ordered a new chassis parts tree from Tamiya and began rebuilding my M03 with the addition of a few hop-ups. For those who missed the last article, let me recap...

• The first thing to go were the stock plastic bushings. To add to the longevity of the drivetrain, I added a complete set of Tamiya's high-quality, blue-sealed ball bearings. The ball bearings increase overall durability, as well as help extend run-time.

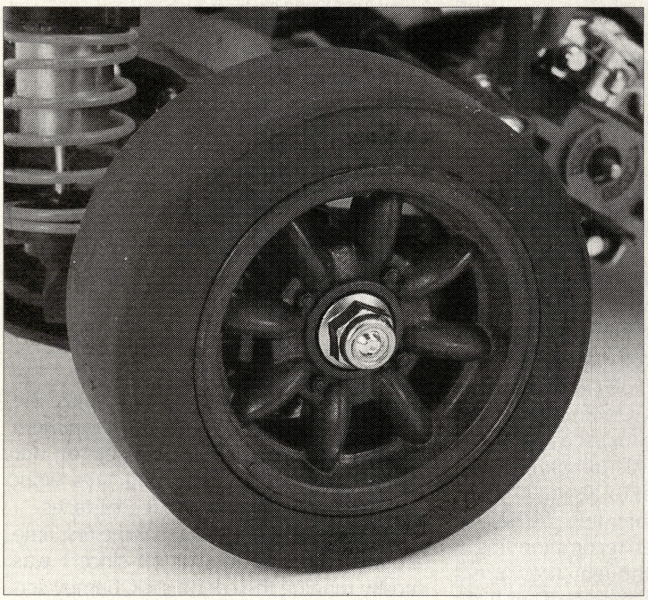
• Next, in went a TA03 ball differential. The stock gear differential, while proven reliable, is not placed very high on the performance food-chain. Gear diffs generally tend



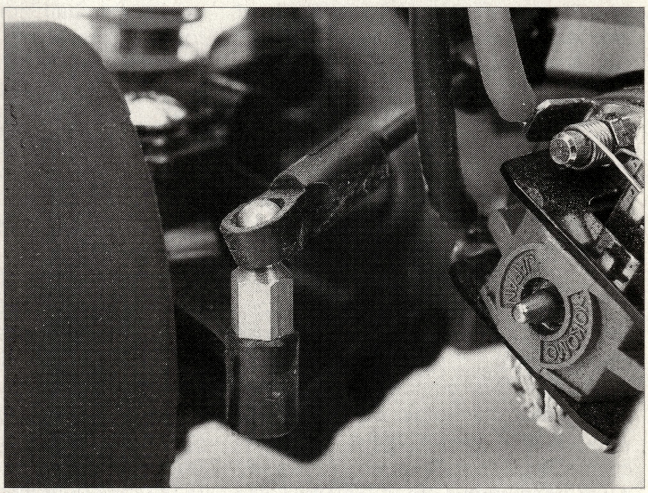
Tamiya's purple-anodized aluminum shock set is a great way to add form and functon to your M-chassis. These oil-filled shocks look fantastic and also vastly improve the car's handling at higher speeds.

M03 Setup

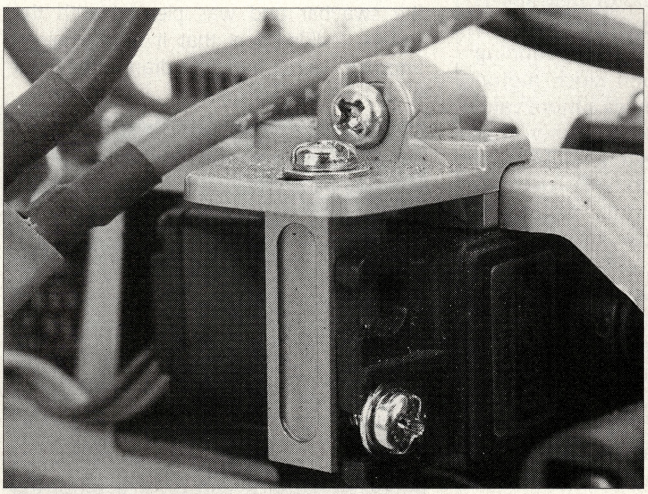
Suspension:
Front Shocks
TA03 Aluminum Shock Bodies
40wt Associated Silicone Oil
Two hole pistons
Blue Tuned springs
Rear Shocks
TA03 Aluminum Shock Bodies
40wt. Associated Silicone Oil
Two hole pistons
Red Tuned springs
Rear sway bar
Electronics:
Motor—Matrix Rebuildable Stock Motor
Pinion—16-tooth
Batteries—Trinity 2000mAh cells (stick pack configuration)
ESC—Novak Atom
Receiver—JR R200 (75mHz)
Steering Servo—JR Z4750



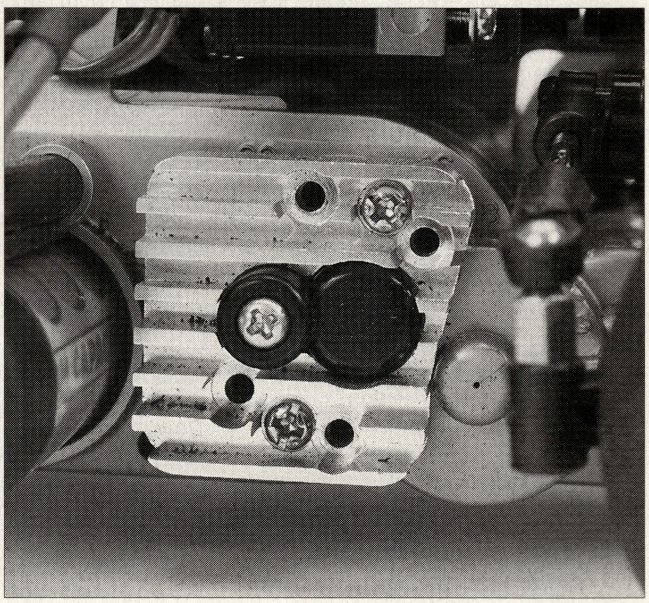
The addition of better tires should be the number one thing you do to your mini (well, number two after adding bearings. Tamiya's Type A M-chassis belted slick tires work awesome.



Always check the plastic steering arms, where the tie-rod connect, for cracks. Pay special attention to the area where the aluminum standoff threads into the plastic.



The quest with most Tamiya sedans is to reduce steering slop. These nicely machined aluminum servo mounts take a step in the right direction.



Much of our past trouble with the M03 chassis stemmed from overheating. Tamiya's optional aluminum heatsink keeps the motor running cooler.

to unload one wheel under hard cornering situations which doesn't allow the car to efficiently transfer power to the ground. A gear diff-equipped M03 tends to "chatter" through a turn instead of driving smoothly through. The inclusion of the TA03 ball-diff allows the Mini to get the power to the ground effectively through the turns as well as accelerate in a straight line much better.

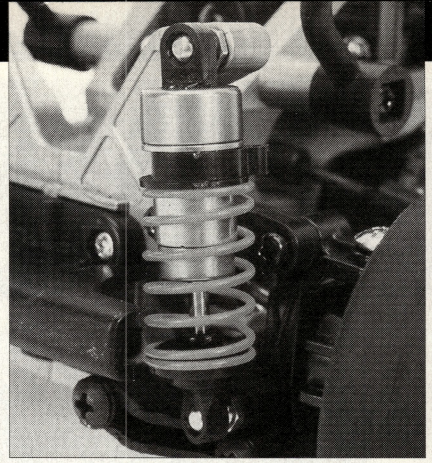
• To help keep the motor cool, I installed one of Tamiya's finned aluminum motor heatsinks. This item helps draw heat away from the motor and gearbox—you want to keep as much heat out of that gearbox as possible, to help prevent any driveline failure.

• New shocks were next on the list. Initially, I installed a set of plastic shocks I stripped from my TCS-prepared TL01 touring car. Soon after the first article was completed, Tamiya America sent me a full set of new purple-anodized, aluminum TA03 shocks. On they went, complemented by Tamiya's On-Road Tuned Spring Set.

• Another new hop-up I received from Tamiya was a pair of 2-degree toe-in rear hubs, which provide better turn in and more stability.

• Tamiya M-Chassis 60D Reinforced Type A tires help glue the car to our test track. Initially, I ran the car mostly on untreated pavement and didn't realize the true potential of these tires until I ran them on the treated asphalt featured at our track. The Type A compound tires work very well on high-grip, treated surfaces.

• I installed a rear sway-bar the first time around, but then took it off since I was mostly running the car on slick, bumpy surfaces—the sway-bar made the car a handful to drive. Once I started running on our new smooth, high-bite test track, I re-installed the swaybar and was pleased with the results. I didn't feel that it alone helped improve overall handling dramatically, but it did help somewhat. ◆



Shock springs from Tamiya's Tuned spring set stiffen the suspension for better cornering.

M03 Parts List

Tamiya Ball Bearing Kit
(part no.—53008 1150/53030 850)
Tamiya TA03 Ball Differential
(part no. 53267)
Tamiya Aluminum Heat Sink
(part no.—53344)
Tamiya Front & Rear Stabilizer Set
(part no.—53343)
Tamiya Aluminum Purple Anodized Shock Set (2 pairs—part no.—53155)
Tamiya On-Road Tuned Spring Set
(2 pairs—part no.—53163)
Tamiya 2-Degree Toe-In Rear Hubs
(part no.— 53345)
Tamiya M-Chassis 60D Reinforced Tires Type A (2 pairs—part no.—53340)
Tamiya Aluminum Servo Mounts
(part no.— 49092)
Team Associated 40wt Silicone Shock Oil

M03 Performance Evaluation

With its front-wheel drive system, this little car is a blast to drive. I found that when the car enters a turn initially, it tends to get a little loose in the rear, but getting the car straightened out is as easy as pulling the trigger—just apply a bit more throttle and the car pulls itself through the tightest turns effortlessly. The addition of some mods helped increase the car's reliability considerably (the ball bearings and aluminum motor heatsink). The other mods such as the TA03 ball diff and TA03 aluminum shocks really helped improve the car's handling substantially. And the overall reliability of the car continues to amaze me. I will readily admit that the car has seen its fare share of time on its lid, and while racing against larger 1/10 and even a few 1/8 scale touring cars, sadly it was often punted around the track like a ping-pong ball. In the end, though, the only part I needed to replace was s slightly bent left steering knuckle. It still worked, but while I was performing routine maintenance on the car I decided to replace it before it weakened any more and snapped while racing.

On the down side, I don't know if anyone else out there has experienced this with their own Mini, but my motor was cookin' hot after running a few packs in succession! I had it geared with the smallest possible pinion (16-tooth), but it was still getting way too hot for my liking. When I talked to Tamiya regarding this situation, I was told that so far there haven't been any complaints about excessive motor heating situations. My only recommendation for future M03 pilots wanting to run a 24-degree stock motor would be to allow your car ample time to cool down in between runs.

My only other complaint has to do with the car's steering system. The stock servo saver has to go. This is a car that screams for consistent steering control, and I found that the stock servo saver tends to "wander". Also, the steering linkage action is a little stiff. The ball cup/metal ball joint, once pressed together, provides a very tight fit. I tried to rig up my own steering setup with a set of Team Losi ball-ends and ball-cups but couldn't find tall enough ball-ends to meet the proper height requirement from the steering knuckle up to each steering rod. This is a section in the M03 hop-up line of parts that needs to be looked into!

Overall, though, I'm very happy with the way the car performs. I wouldn't hesitate to recommend the bearing set and TA03 ball diff. Next I would suggest looking into a set of oil-filled shocks and a set of Tamiya's On-Road Tuned Springs. Either plastic or alloy shock bodies will work fine—it's ultimately up to you and your budget to decide if you want to go for the aluminum shock bodies. I lean towards recommending the aluminum units, though; they are noticeably smoother, perform more consistently, and will last longer—you get your money's worth. After that, I think the aluminum motor heatsink is also another valuable hop-up and is worth a look. If you plan on running any type of competition stock motor, then the heatsink becomes a more valuable item in my book. The other hop-ups I've tried and tested all help to make the car more reliable, perform better, or simply look flashier, but I leave that up to the individual to decide whether or not they truly need each and every item discussed in this article. Do you need aluminum servo posts and different color anodized wheel nuts to make your M03 faster? Of course not! Do they make the car look better—absolutely! As I said, there are a few parts I feel are necessary in making the car handle better—start out with those items and see how your Mini performs and go from there. ●

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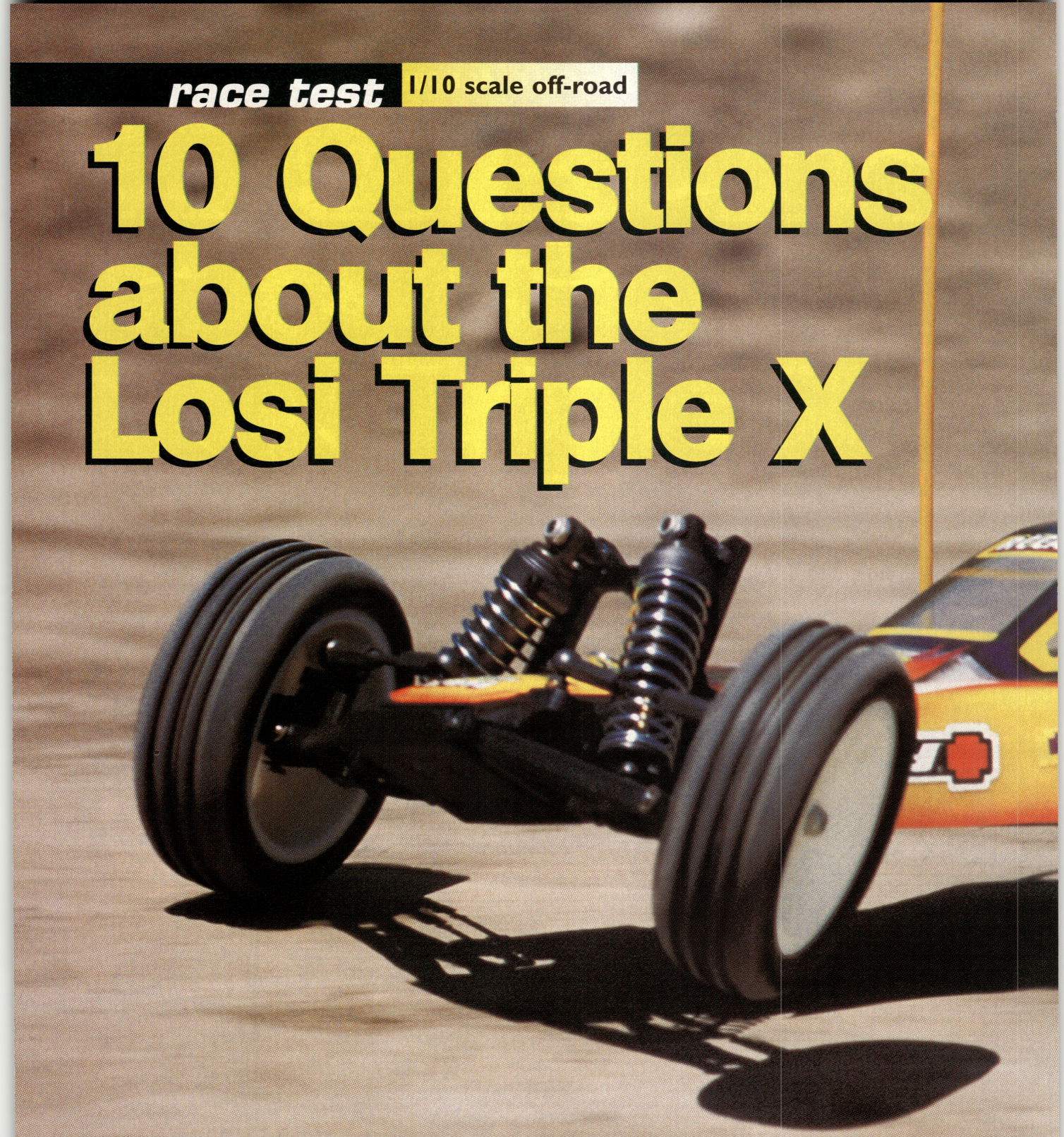
10 Questions about the Losi Triple X



In the market for a new 2WD off-road buggy? Heard that Losi's new Triple-X swept the ROAR Off-Road Nationals its very first time on the track? Sound interesting? We've tried to anticipate the ten questions potential owners might have. So if you want to know more about Losi's all-new 2WD off-roader, read on!

Question One: Is the Triple-X an all-new car or merely an update of the Double-X?

If you think that the Triple-X is a modified Double-X, you're dead wrong. The Triple-X is an all-new design that's been on the drawing board for nearly three years. Gil Losi Jr. has been working on this car's basic design since the Double-X's introduction in 1993, using a special "test mule" chassis that can accept experimental front and rear suspensions to allow real-world testing of suspension theory.

Triple-X Files

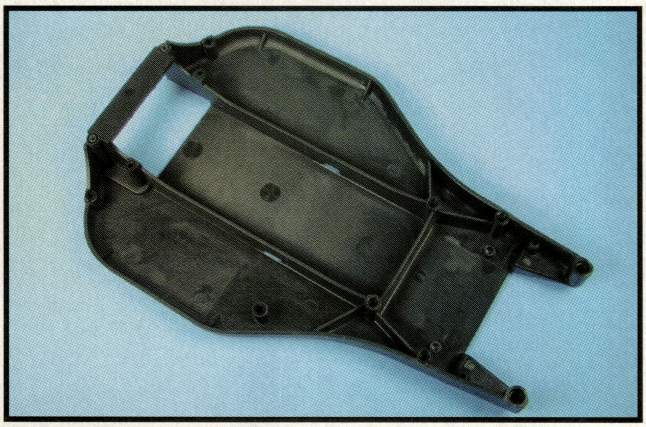


Question Two: What are the biggest differences between the old car and the new Triple-X?

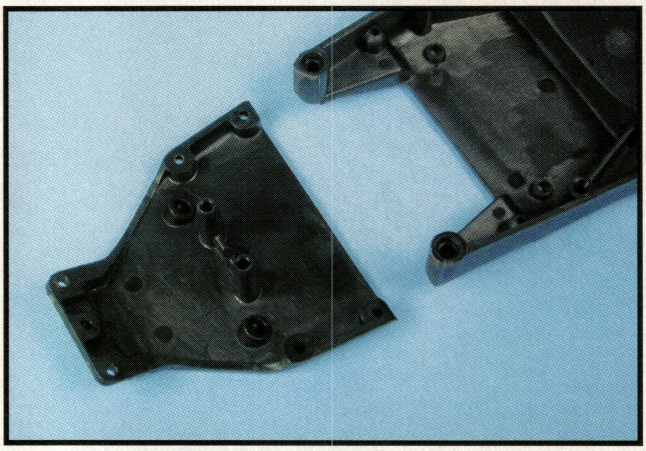
The answer to this question would take up this month's entire issue, so we'll just describe what we feel are the most significant differences between the old and new cars.

(1) The Triple-X has a much lower CG (center of gravity). One of Losi's most important goals when designing the Triple-X was to create a chassis that had the lowest possible CG to improve stability and cornering speed. A lower front shock-mounting position and slightly shorter rear shocks are just two of the ways Losi was able to keep the weight of the Triple-X as close to the ground as possible without compromising maximum ground clearance.

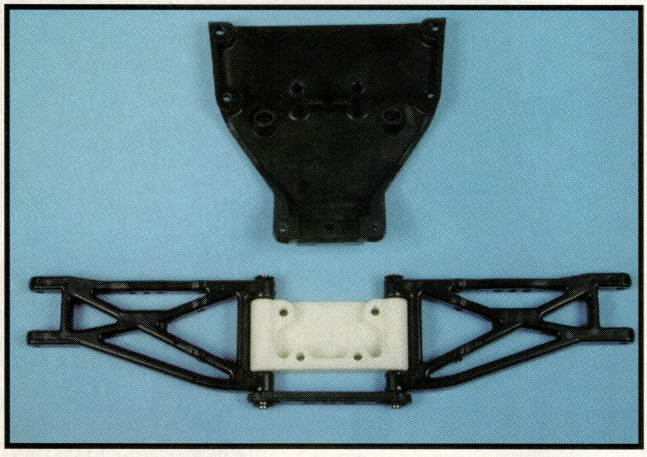
(2) There's much less weight out past the rear axles. If you look at the Triple-X, you'll notice that the motor is tucked quite far into the rear of the chassis. With less weight hanging out past the rear axles, the Triple-X is able to make much faster transitions through the turns. Sometimes, all that weight hanging out in back can act as a pendulum against the rear suspension. When a typical 2WD off-road car corners, the weight of the motor pulls the rear of the car outward, but when the car straightens out again, the weight of the motor swings the other way and can actually pull the rear of the car in the opposite direction, causing an inexplicable loss of rear traction. Because of its "tucked" motor



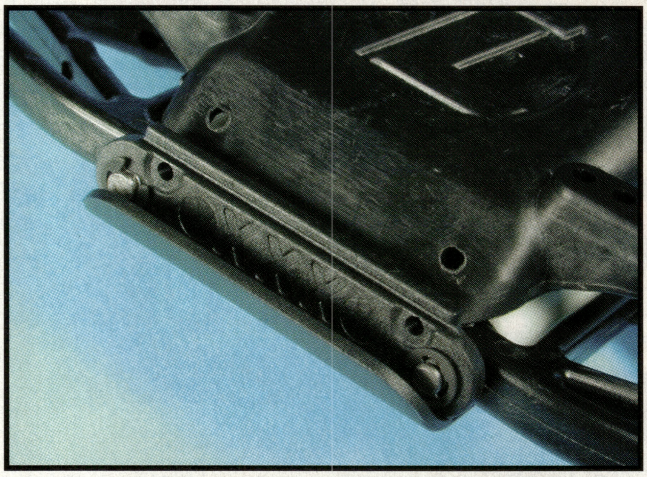
The Triple-X's all-new molded chassis is wider to accommodate virtually any type of speed control. On the old Double-X chassis, larger speed controls had to be mounted on the shock tower as they didn't fit into the chassis tub. Although not evident in the photo, the battery compartment is placed further back to offset the motor's position, which has been moved forward to improve cornering.



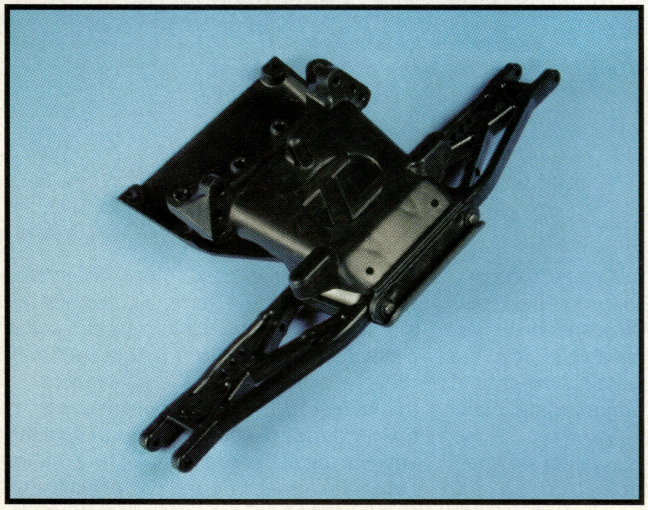
The molded front nose-piece serves as the foundation for the suspension and the steering bellcranks. This piece attaches to the chassis so securely that steering is increased because of the added rigidity. This design also makes it incredibly simple to remove the entire front suspension assembly from the chassis for routine maintenance.



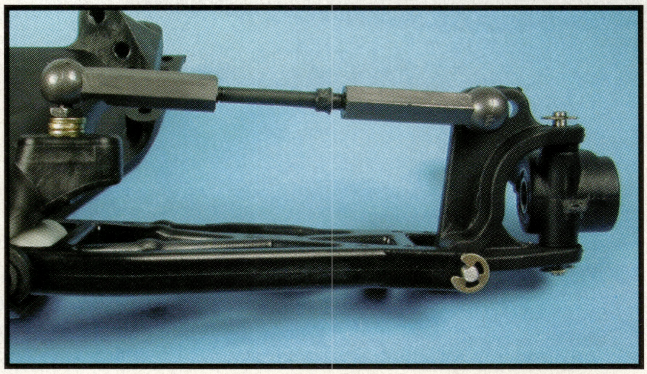
The front suspension arms attach to the nose-piece by this special bulkhead, molded from Losi's white composite material that's more durable than a typical nylon-composite material. The bulkhead material is strong enough to keep the front arms pointed in the right direction, but is flexible enough to absorb impact without breaking.



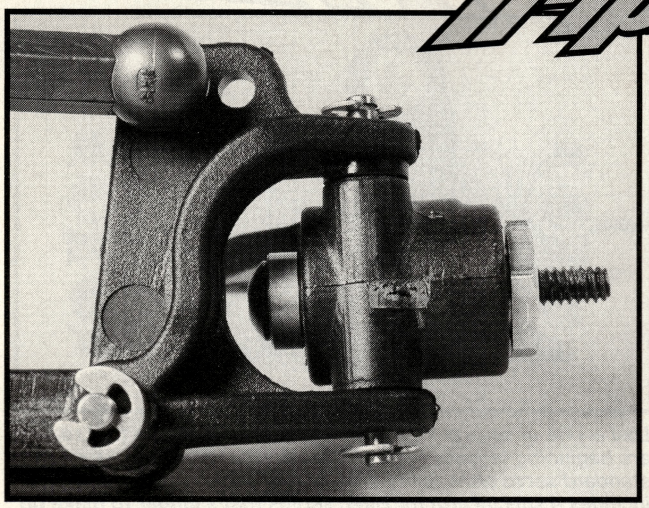
This molded brace helps prevent the front suspension bulkhead from snapping during a collision. It also serves as a mount for a soon-to-be-released front swaybar kit from Losi. Two tiny Allen-headed screws will thread into the brace to secure the swaybar.



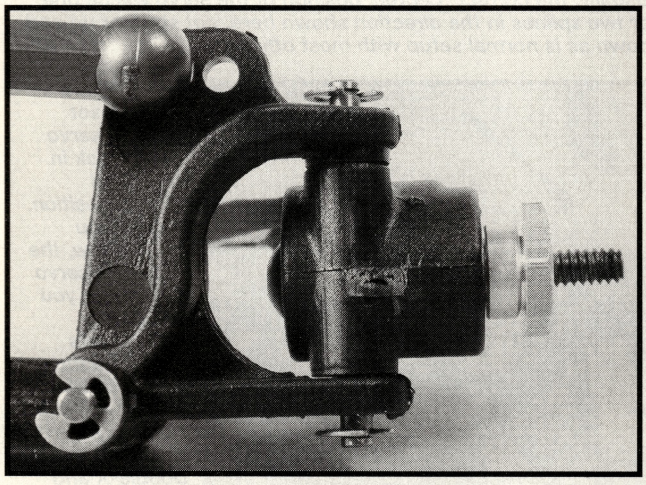
This large molded front suspension brace ties the lower nose-piece and the bulkhead to the main chassis and really stiffens the entire front end of the car.



The Triple-X's unique front suspension design made it necessary for the front camber-rod to be attached to the suspension bulkhead instead of to the shock tower. This actually works out pretty well, as you can change the height of the inner rod location by using small washers. This is similar to the way the outer camber-rod height could be adjusted when using the old ball-stud/kingpin setup on the Double-X Kinwald Edition, except that now, you don't have to remove a wheel to get to the ball-stud—it's on the bulkhead!



The Triple-X's front axles were made longer so that they can be spaced in or out from the front spindles. In this photo, you can see that there is an aluminum spacer between the head of the axle screw and the inner axle bearing. This axle is set in the "narrow" configuration, so that you can use Losi's new wide front wheels without exceeding the maximum legal width of the car. You can also run the front axles narrow and use standard front wheels to reduce the car's steering for slippery tracks.



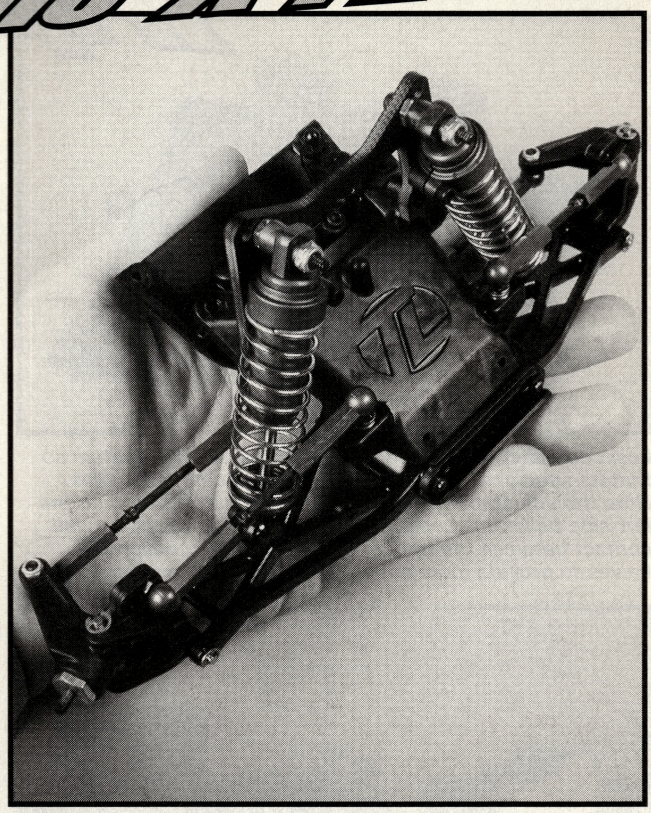
In this photo, the axle spacer has been moved to the outside of the spindle to widen the front of the car. If you use this setup with wide front wheels, your Triple-X will be to wide under current ROAR and NORRCA rules. This setup, when used with standard-width front wheels, will generally provide less steering than with wide wheel/tire combos, yet it retains the stability that comes with a wider stance.

placement, the Triple-X is much more stable when entering and exiting turns, and as an added bonus, the motor is less likely to "case" the ground when landing nose-high from big jumps.

To prevent having too much weight over the front wheels, which would sacrifice rear traction, you'll notice that the steering servo and battery are placed more reward.

(3) The front and rear suspensions of the Triple-X are modular, which means that they can be individually removed from the main chassis completely intact, making maintenance much less tedious.

(4) Losi's new AGD (Advanced Geometry Design) steering geometry eliminates bump-steer during cornering. Bump steer occurs when the angle of the front wheels changes as the suspension is moved up and down. In nearly every instance, this is undesirable. Because its steering bellcranks are angled rearward



After removing just six screws, you can literally take the entire front end from the main chassis whenever you want to do a little repair or maintenance.

the same amount as the steering kingpins, the Triple-X's steering remains in-line with the movement of the steering arms throughout their range of travel.

Question Three: Why are the front arms so short?

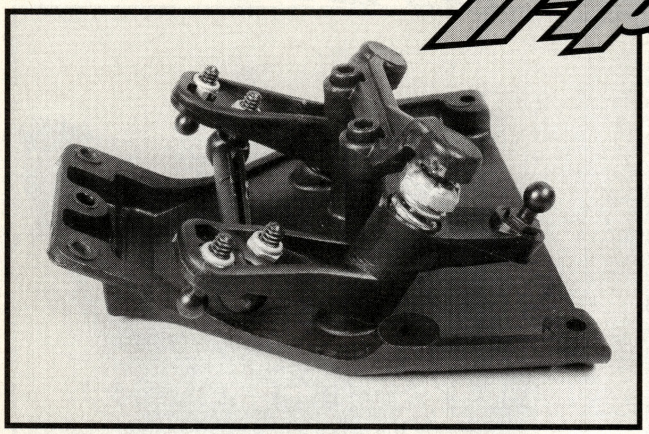
We have to admit that we gave the Triple-X a more-than-curious glance when we saw that its front arms are substantially shorter than its rear arms (and substantially shorter than those on the Double-X). When the design trend for the past ten years has been to build cars with longer and longer suspension arms, Losi's new philosophy certainly goes against the grain.

Generally speaking, a long-arm suspension works better through the bumps, while a short-arm suspension creates less chassis-roll and increases steering response. Losi experimented with arm lengths until finally finding a length that was an ideal compromise between rough-track handling and fast steering response. As a result of its short front arms (along with a host of suspension geometry changes), the Triple-X handles at least as well through the bumps as the old Double-X, but has more steering.

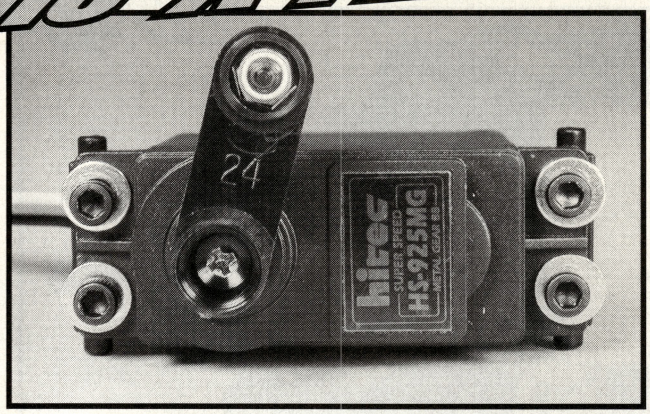
Question Four: Why did they lower the transmission ratio from 2.19 to 2.43?

During years of testing, Losi team drivers, most notably Brian Kinwald, have experimented by running the 2.6:1 ratio tranny from the Double-XT truck in their Double-X buggies. They felt that the higher ratio of the truck tranny gave their buggies greater acceleration. But as a counterpoint to this, there were those who preferred the buggy tranny's lower 2:19:1 ratio. Basically, Losi decided to "split the difference" between the two ratios—hence the 2.43:1 final ratio of the Triple-X. In our opinion there will most likely be a Triple-XT truck to follow hot on the heels of the new buggy, and it should share the Triple-X's 2.43 tranny ratio.

Triple-X Files

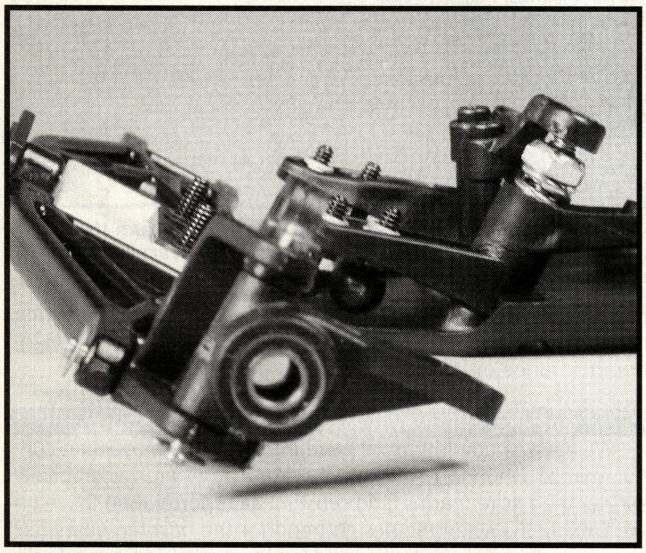


Losi completely redesigned its steering bellcrank system so that its angle matched that of the front steering spindles. Note the adjustable servo-saver that's incorporated into the left-side bellcrank. Losi's servo-saver design maintains full contact between the upper and lower molded bellcrank halves to provide more consistent action with almost no slop.

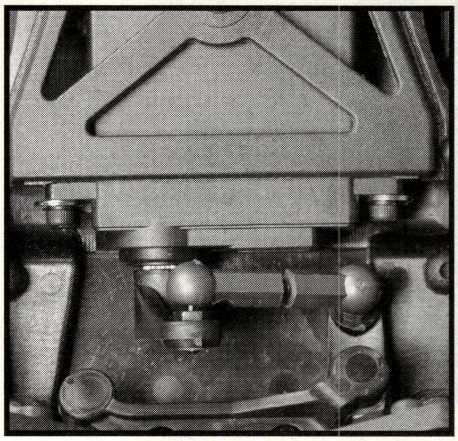


Losi is one of several kit manufacturers to recognize that racers are beginning to grow fond of Hitec servos. Along with the standard servo arms for Futaba and Airtronics servos, Losi also includes a special arm for Hitec servos that's longer to make up for the slight reduction in throw that these servos have.

Also of note is that the Triple-X's steering system has been developed to provide equal servo throw in both directions. This means that you can set your steering trim to zero and the left/right throw can be set equally. When this is possible, the car's steering speed and proportion to your commands, will be dead-equal for both left- and right-hand turns. To properly set your servo for equal throw, Losi provides you with the exact length of the steering tie-rod that will work with your servo. Usually, the correct "center" position of the servo will be one or two splines in the direction shown here, not straight up and down as is normal setup with most other cars.



Here you can see how the angle of the steering bellcranks matches that of the steering spindle. This design eliminates unwanted bump-steer from the handling equation. It also prevents the inside front wheel from getting sloppy during full-lock cornering.



Here's how a properly set steering servo should look in the "dead ahead" position. In case you didn't know, the Triple-X's servo mounts let you keep your servo's ears intact! No more having to trim the ears to fit the chassis, as is the case with the Double-X and Double-XT.

Question Five: Is it hard to set up the Triple-X?

Ironically, the latest and greatest Losi buggy is the easiest to tune. Previously, it seemed as if Losi provided as many camber-rod and shock-mounting holes as they possibly could to allow for future tuning potential. This did make previous Losi buggies highly tunable, but the possibility of less experienced racers tuning themselves out of the race was everpresent.

The Triple-X offers fewer tuning options than the Double-X, but as we were told by Losi, "these are the *right* camber and shock positions!" After all of the testing had been completed on the Triple-X, it was determined by Losi engineers that only the very best camber and shock positions should be included in the production kit. As a result, it's easier to get the Triple-X dialed-in, and much, much harder (if not downright impossible) to get it dialed-out.

Question six: How does the Triple-X corner?

If we had one complaint about the Double-X's handling, it was that you couldn't coax aggressive steering out of it without a corresponding (and detrimental) reduction of rear traction. Cornering speed also fell victim to this tendency to slide through turns rather than cruise through them. We're happy to report that the Triple-X has tons of steering. But did we mention that it also has tons of rear traction to go with it? It's true, the new car rails turns like an on-road car without scrubbing away corner speed. During our race test, we found that the Triple-X was able to hug the tightest lines through the tightest turns, and did so without excessive rear-end sliding or the need to use a lot of brake.

Another feature of the new car's steering that must be addressed is the way that it floats through bumpy turns like no other car we've tested. Our test track, at Hot Rod Hobbies in Saugus, California, has many high- and low-speed turns that are riddled with deep ruts and holes. The Triple-X doesn't even seem to feel them; you can keep it pretty well pinned without worrying about rolling the car onto its roof. We should point out that, during our race testing, we never once rolled the Triple-X during a turn—too bad we can't say that we didn't flip it and barrel-roll it by goon-riding over some big jumps!

Amid all this praise for the Triple-X's cornering ability, we should add that we haven't yet begun to experiment with chang-

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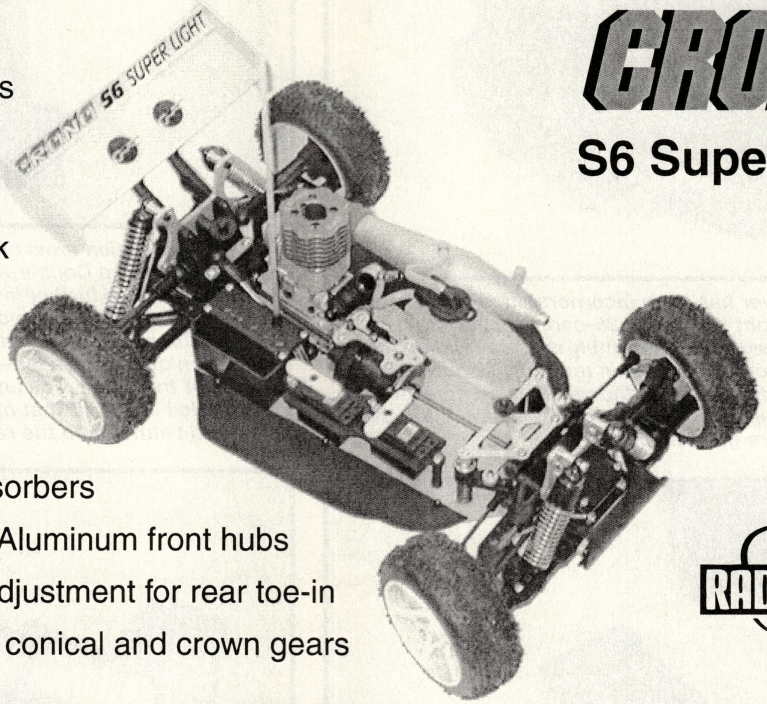

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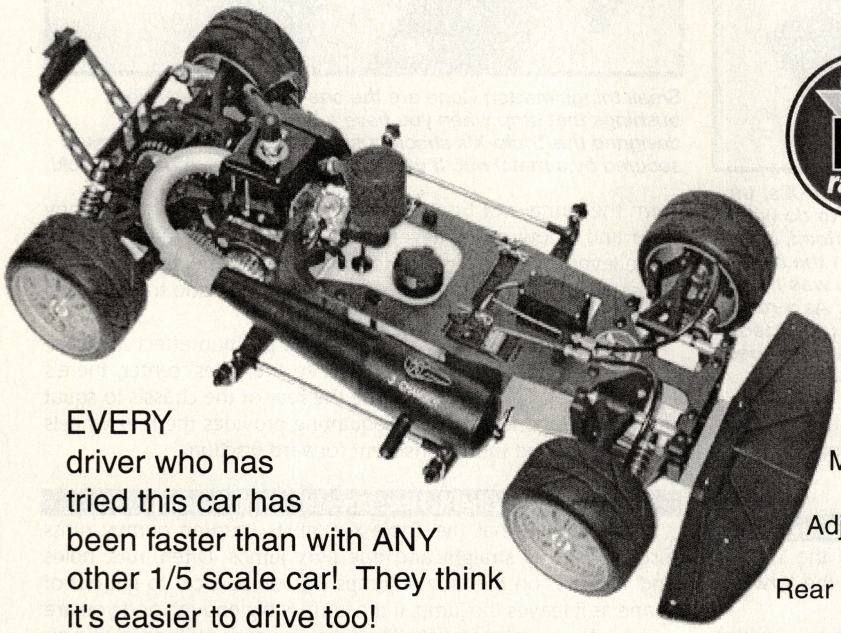

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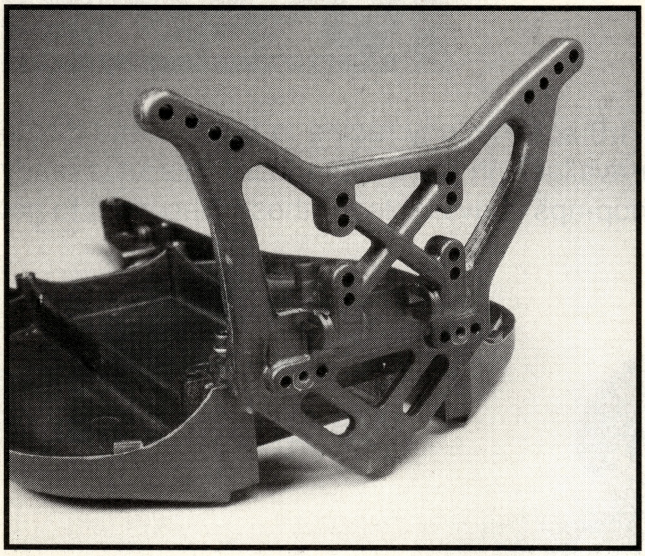
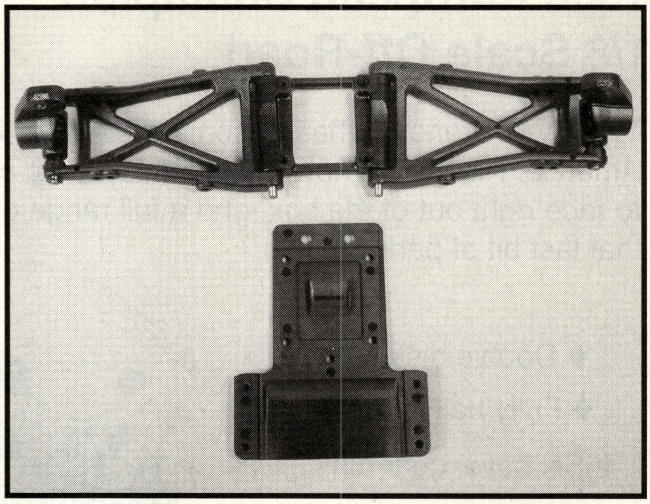
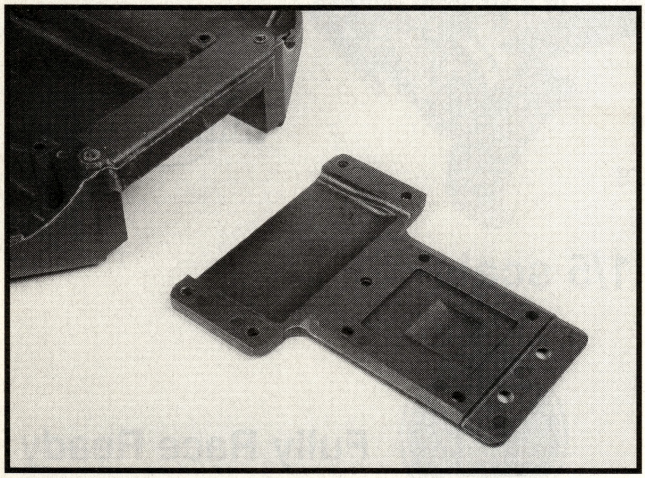


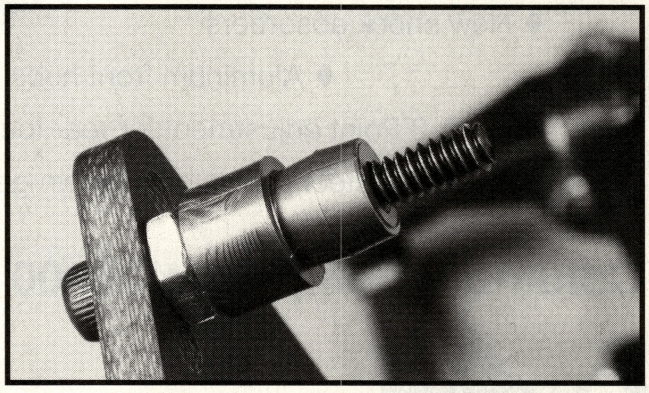
The rear shock tower has been incorporated into the rear bulkhead for a weight savings of 35-percent over the old car's two-piece design. This assembly is more rigid so that the suspension's action will remain more consistent. Double-X owners will wonder where all the camber-rod holes went. Losi decided to simplify chassis tuning by offering just three holes—but these are good holes!



The rear suspension arms of the Triple-X are the same as those found on the Double-X. The difference here is that the arms are mounted further inward on the Triple-X, and that new rear hub carriers were designed with enough offset to maintain the proper rear width. The arms attach to the rear suspension plate with a one-piece arm mount that has 3-degrees of toe-in per side and 2-degrees of anti-squat. Shims are included in the kit that allow you to make subtle, two-degree adjustments to the rear anti-squat angle.



Although similar in appearance to that of the Double-X's, the Triple-X's rear suspension plate actually has little to do with the strength of the rear portion of the chassis. Instead, it is the transmission and new rear bulkhead that form the backbone the Triple-X. On the Double-X, the rear plate was mostly responsible for the rigidity of the rear suspension. As a result, when you broke your Double-X's rear suspension (admittedly a rare occurrence), it was usually the plate that had snapped. The Triple-X's rear end should prove more durable.



Small things matter: Gone are the one-piece molded shock bushings that strip when you have a hard crash. Losi re-designed the Triple-X's shock bushing so that the long screw is secured by a metal nut. If you strip or break this, you are a hack!

ing the car's shock angles or roll-centers. Not to say that the "factory" setup might not be ideal, but just think about how good this car might be when you find that perfect setup!

Question Seven: How does the Triple-X accelerate?

Two things are chiefly responsible for how well the Triple-X powers out of turns: the new 2.43 tranny ratio and the forward-mounted motor.

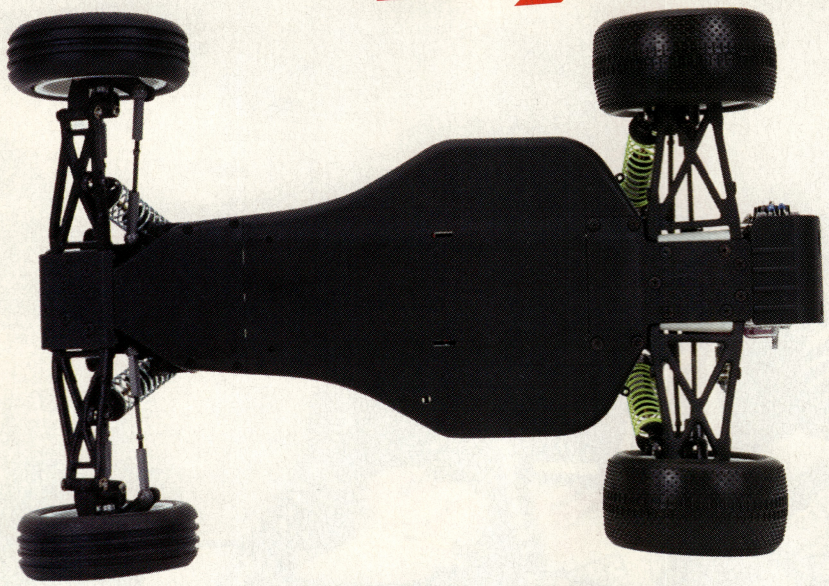
Many people believe that if you take two cars, one of which has a lower tranny ratio than the other, and match their final drive ratios (computed by dividing the number of teeth on the spur gear by the number of teeth on the pinion, and multiplying that number by the transmission's ratio), that both cars will perform the same—not true! The difference between a high tranny ratio and a low one is leverage. A lower tranny ratio provides more leverage for the motor to spin the rear wheels, resulting in faster acceleration than a car that has a higher-ratio tranny (even if both cars have the same final drive ratio).

How, you may ask, does the motor's position affect acceleration? Simple: With the motor closer to the axles' center, there's less overhanging weight to cause the rear of the chassis to squat under hard acceleration. Less squatting provides the rear wheels with greater and more consistent forward traction.

Question Eight: How does the Triple-X jump?

The stability that the Triple-X exhibits through bumpy turns also helps it fly straight and true over jumps. Often, ruts, holes and "kickers" on the face of jumps can cause a car to get out of shape as it leaves the jump. If the jump is big enough and you are a good driver, you can usually correct the car's attitude in mid-air by either applying the throttle to raise the front end, the brakes to lower the front end, or by steering to the left or right to tilt the car from side to side. Fortunately, the Triple-X's suspension and weight distribution compensate for small irregularities on the

Triple-X Files



Type: 1/10-scale 2WD off-road racing buggy

Manufacturer: Team Losi, Inc., 13848 Magnolia Ave., Chino, CA 91710 • phone (909) 465-9728; fax (909) 590-1496

Price: $349

What you get: Complete rolling chassis. You much purchase a two-channel radio with one servo, a six-cell battery pack (sub-C size), battery charger, electronic speed control, paint and superglue for the tires

Length.....14.75in./375mm
Width.....9.8in./250mm
Wheelbase.....10.6in./270mm
Track (F;R).....7.6in./193mm; 6.4in/163mm

Intelligent engineering has allowed Losi to build a sophisticated off-road buggy that uses few fasteners to hold it together. As a result, the Triple-X is easy to work on.



The Triple-X gets Losi's new and improved shock bodies that have received a better coating/anodizing process that makes them smoother, more precise and more durable. The length of the front shock body (left) remains the same as that of the Double-X, but the rear shock body (right) has been shortened to match the Triple-X's new suspension geometry and to lower the car's CG.



The gearbox is a critical structural member, adding rigidity to the rear suspension area. As you can see, the gearbox keys to the rear shock tower/bulkhead and is secured by a single, long screw.



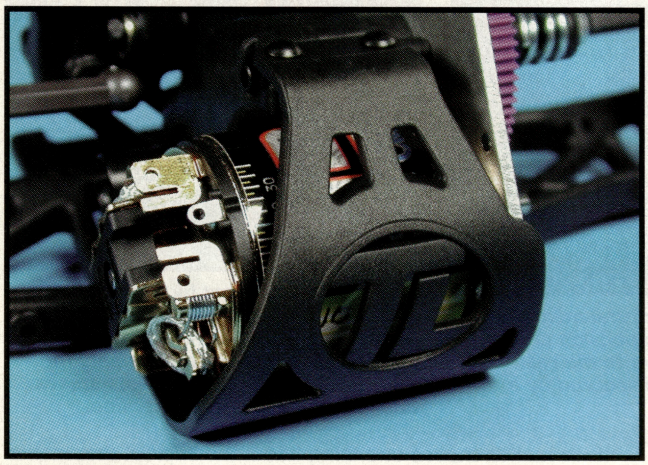
Losi has learned that by centering the motor along the middle of the chassis, cornering and acceleration become more consistent. As you can see, the bulk of the motor's mass rests smack dab on the Triple-X's center line.

jump's face, making it less likely that the car will end up on its lid when it lands.

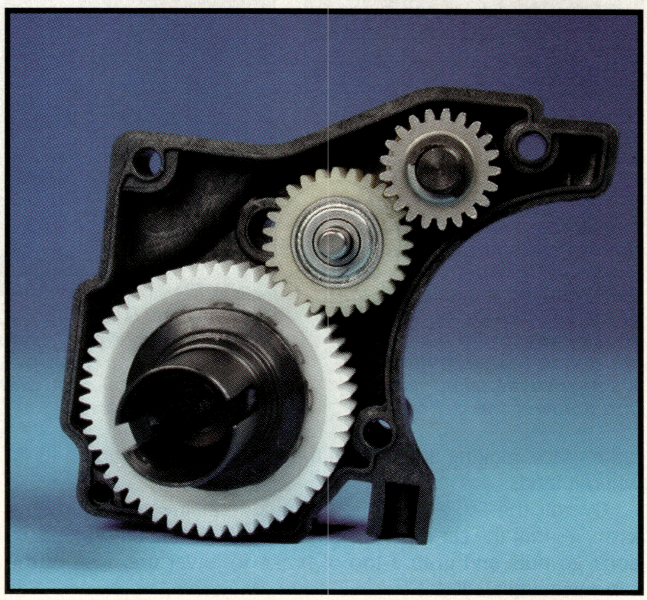
Overall, the Triple-X is an excellent jumper. If we have any criticism, it's that the car is particularly sensitive to mid-air braking, so don't go nuts and grab a ton of brake to lower the nose of the car—just a little will do!

We found the Triple-X to be confidence-inspiring over big jumps. One jump at our test track actually goes over a straightaway (like a figure-eight demolition derby track). Needless to say, you can get some serious air time on this jump! The Triple-X rarely got out of shape over this jump. Even when we got the car a little sideways, its suspension did a great job of soaking up the landing.

If we had to choose one thing about the Triple-X that makes its handling shine particularly brightly, it would be how solidly the car lands from big jumps. Many cars that we have driven tend to "unload" after their suspension is bottomed out from landing off a big jump. When this happens, most of the weight of the chassis is taken away from the tires, causing a momentary loss of traction. This is why your car sometimes spins out when it lands from a big jump. The Triple-X really doesn't do this at all; it bottoms out like any other car, but it somehow manages to keep weight on the tires so that it never loses too much traction. This particular attribute is most noticeable when you have to make a quick turn immediately following a jump.



The molded rear motor-guard provides good protection and won't become bent. Losi will be offering optional guards in either blue or yellow (along with a matching front bumper and body mounts.



Split personality: inside the Triple-X's transmission cases you'll find the top shaft and gear from the Double-XT truck, a new differential gear, and the idler gear straight out of the Double-X buggy. Together, these gears provide a reduction ratio of 2.43:1—much lower than the Double-X's 2.19 ratio. Also notice how the gears have been "stacked" to allow the motor to be moved more forward.

Question Nine: Is the Triple-X easy to work on?

We wrote earlier that one of Losi's goals was to make the Triple-X's CG as low as possible. Another goal was to make it easier to build and to maintain. They succeeded. Here's why: First, even though it's more technologically advanced, the Triple-X goes together more easily than the Double-X. As we built our test car, we found ourselves wondering if we weren't missing parts! The car

Triple-X Files

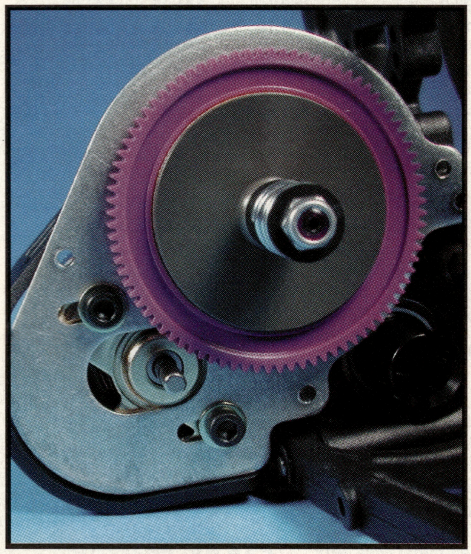


What a dish: Triple-X owners will be treated to Losi's all-new dish wheels. Both the front and rear wheels are wider and have a molded-in "Losi" logo in case you forget which car you are driving.

actually has a lower parts count than its predecessor. What's more, the overall design of the Triple-X is so much more elegant than that of the Double-X, with cleaner lines and less "stuff" going on—it's certainly less "busy" looking.

Along with this streamlined new design comes easier access to critical components. Specifically, the front and rear suspensions can be unbolted from the main chassis as complete assemblies. This makes it much easier to perform pre-race overhauls without having to reduce the car to a pile of rubble.

As examples of how Losi has further simplified maintenance, the entire transmission can be taken out of the car by removing just three screws, the front suspension comes off by the removal of six screws and a ball-cup, and the entire rear suspension, including the tranny, can be taken off by removing just six screws. And might we add that you won't have any "straggling" camber- or steering-rods to pop-off—they come off with the suspensions.



No more bent motor plates (well, at least it'll be more of a challenge to bend them!). Losi has made the motor plate separate from the rear motor guard. Now when you case a jump or your racing buddy rearends you, the motor plate won't get all tweaked and mess up your gear mesh. The dual-disk slipper clutch is a carryover from the Double-X Kinwald Edition.

Question Ten (drum-roll, please): Should you sell your Double-X?

Normally, we would answer this question by saying that a new car won't make you faster, and that you should work on improving your driving skill before you spend more money. But in this case, the Triple-X is so overwhelmingly better than the car it replaces that we must make an exception.

We truly feel that if you are a decent driver and can do a fair job of setting up your car, that you will be faster with the Triple-X. The best way we can sum up the differences between driving the Triple-X versus the Double-X is that the Triple-X does everything that the old car does, but carries more speed through the turns and has more stability through choppy track conditions. Throw in the fact that the new car jumps and accelerates better, too, and we definitely advise that if you want to beat all your friends who have upgraded from the Double-X to the Triple-X, you'd better get one too. ◆

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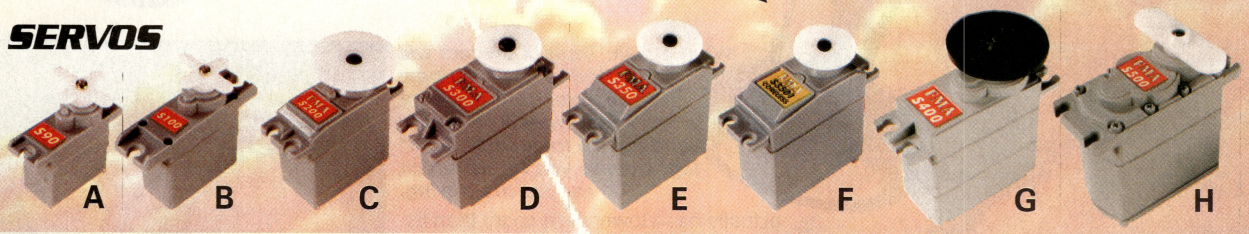

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B	S100	MICRO BB	1.06 X 0.50 X 0.97	0.49	METAL	25.0	ALL	0.15	$21.95	METAL
C	S200	MINI DOUBLE 2BB	1.22 X 0.63 X 1.18	0.85	GEAR	44.5	AT	0.23	$21.95	GEAR
D	S300	STANDARD BRONZE BUSH	1.59 X 0.79 X 1.50	1.55	VERSION	38.0	4 VOLTS	0.15	$10.95	VERSION
D	S301	STANDARD 2BB	1.59 X 0.79 X 1.50	1.55		38.0	UNLESS	0.15	$14.95	
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F	S3501 (M)	CORELESS 2BB M FOR METAL GEAR	1.60 X 0.79 X 1.50	1.59	1.83	83.0		0.10	$44.95	$47.95
F	S3551 (M)	CORELESS 2BB M FOR METAL GEAR	1.60 X 0.79 X 1.50	1.59	1.83	108.0		0.16	$44.95	$47.95
F	S3601 (M)	CORELESS 2BB M FOR METAL GEAR	1.60 X 0.79 X 1.50	1.59	1.83	98.0		0.12	$44.95	$47.95
G	S400	GIANT SCALE 2BB	2.14 X 1.04 X 2.03	4.00		180.5	6.0V	0.20	$24.95	
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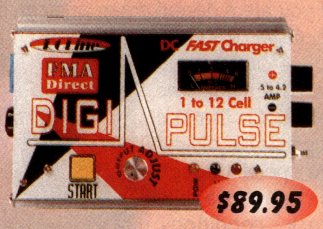

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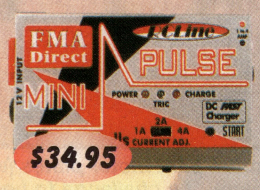

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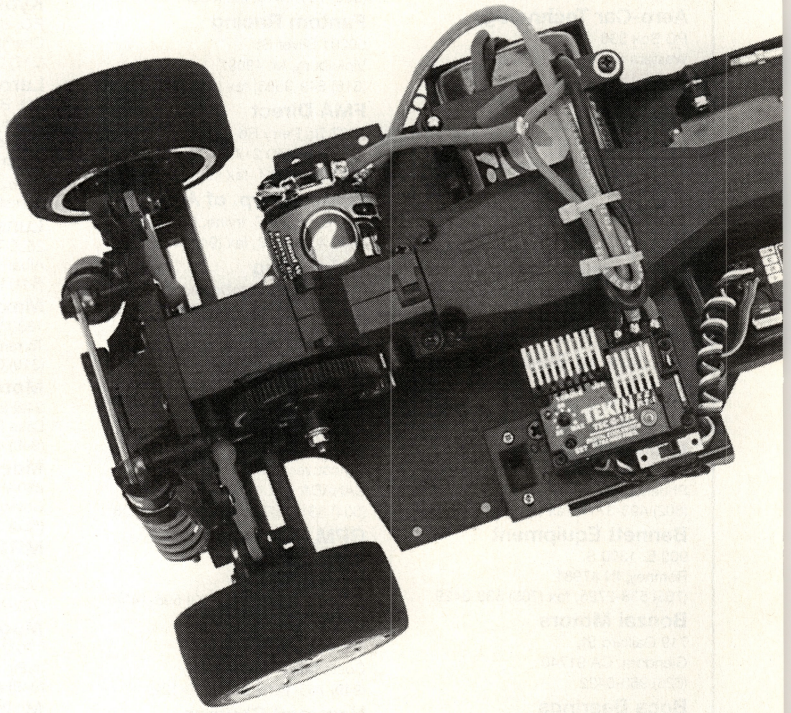


Hobby Tech HT1

Budget Bites Back!

Sometimes we magazine editors forget that the majority of the R/C car hobby is comprised of backyard bashers (editor's note: I thought we hated this term?) and cul-du-sac commandos. There are easily more sport-level cars and trucks sold than high-end graphite and titanium rocket ships. More often than not, the determining factor in these purchases is money. All this considered, we tested the Hobby Tech HT1 in our July '99 issue, and we came away pleasantly surprised. "The HT1 is an impressive value. They just need to re-work the box art." to quote ourselves exactly.

All boxed in

It's nice—and almost therapeutic sometimes—to stand on the proverbial soap-box that a magazine can provide and harp about all the things you'd change in someone else's product. Nevertheless, when a manufacturer actually sits up and listens to your suggestions, and then restructures the way they do things because of your input, well, you begin to feel all warm and tingly inside. For example, when we blasted Hobby Tech for the HT1's mundane box art, we actually touched somebody. According to company president Yvonne Hui, "We listened to what you guys were talking about and have completely redesigned our box." Whoa, the power of the pen...

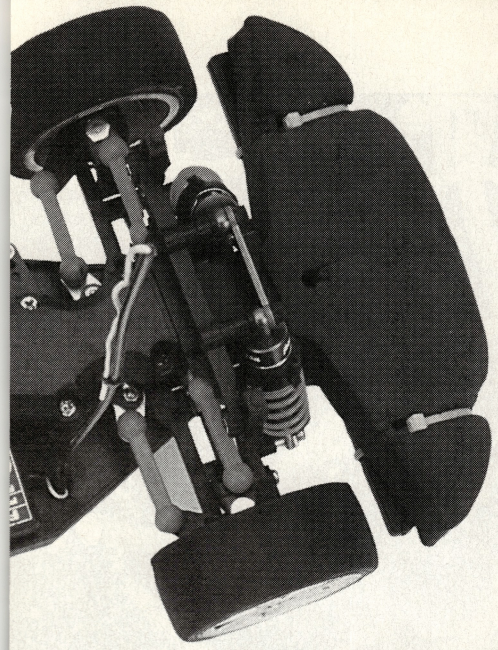
The last box we received featured the HT1 with the only body the company offered, a rather plain-looking "whatchamacallit" stock car body. It was painted yellow for the box art and didn't really look at all like any one particular brand of car. Hobby Tech's new Lexan lid emulates the racy new Ford Mustang. The body alone is a huge improvement and the new box art is actually very striking, which is always a good thing when you're trying to catch the eye of a potential buyer.

After destroying the new Mustang body (before photos could be taken), we picked up the hot new Alfa Romeo 156 body from Hot Bodies, (part no. 10709, $22.00) and their 156 sticker kit (part no. 25709, $16.00) which is absolutely gorgeous. To accommodate the sexy new body style, we swapped the kit's stock solid plastic, non-adjustable, 190mm suspension links for the kit-included 180mm units that are all molded out of bright red plastic. Strangely, the 180mm links appear to make the car a typical 190mm car and the 190mm links make the car sit about 200mm.

Hot rod mod

Sport-level kits are infamous for offering "stock" silver-can 540 motors. These 540s, produced by Mabuchi and Johnson, are incredibly inexpensive and offer longer run times (with less torque and rpm) than typical "competition" stock motors. When testing a new kit, we sincerely try to evaluate the kit in its original form. Rarely, though—okay, never—do we do a long-term test on the car (running pack after pack, week after week) with a 540 soldered in place. The moment the original test of the HT1 was finished, a 16-turn mild-mod Orion motor was transplanted into the HT1.

The only problem we encountered in the HT1's drivetrain was in the spur gear assembly. The two stock plastic nuts on opposing sides of the main driveshaft

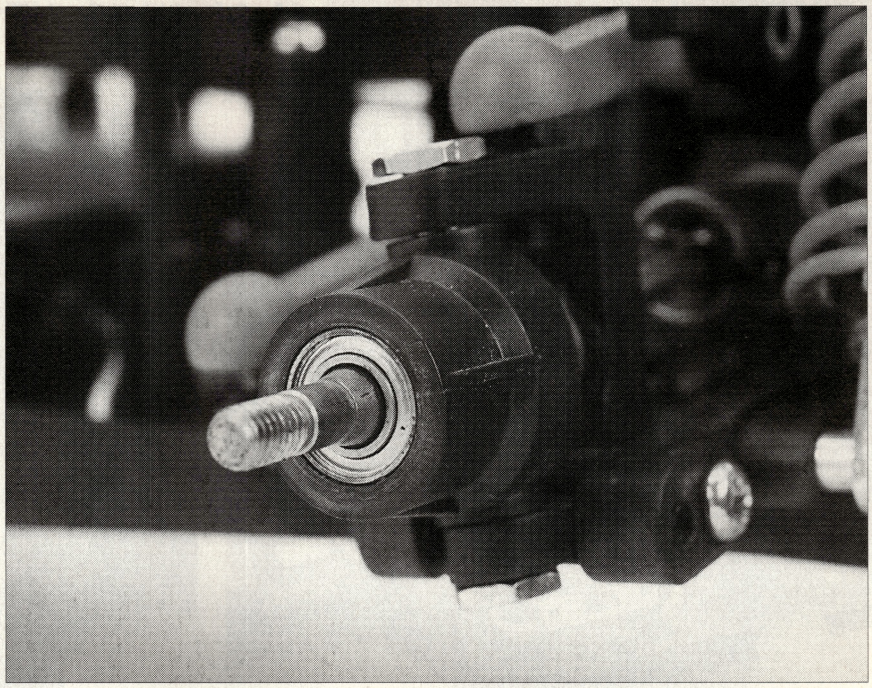


began to loosen with each battery pack. This malfunction was inevitably the result of the added horsepower. The main shaft assembly rides directly on bushings that hold the entire unit in place. With the added kick of the mild mod motor, the shaft spins much faster, creating much more friction. All this friction creates heat, which conducts easily down the shaft to the waiting plastic nut. Plastic softens, nut comes off—end of story and end of run. We remedied this for 26 cents at the local "Hardware Hank" store by purchasing a suitable aluminum locknut with nylon insert.

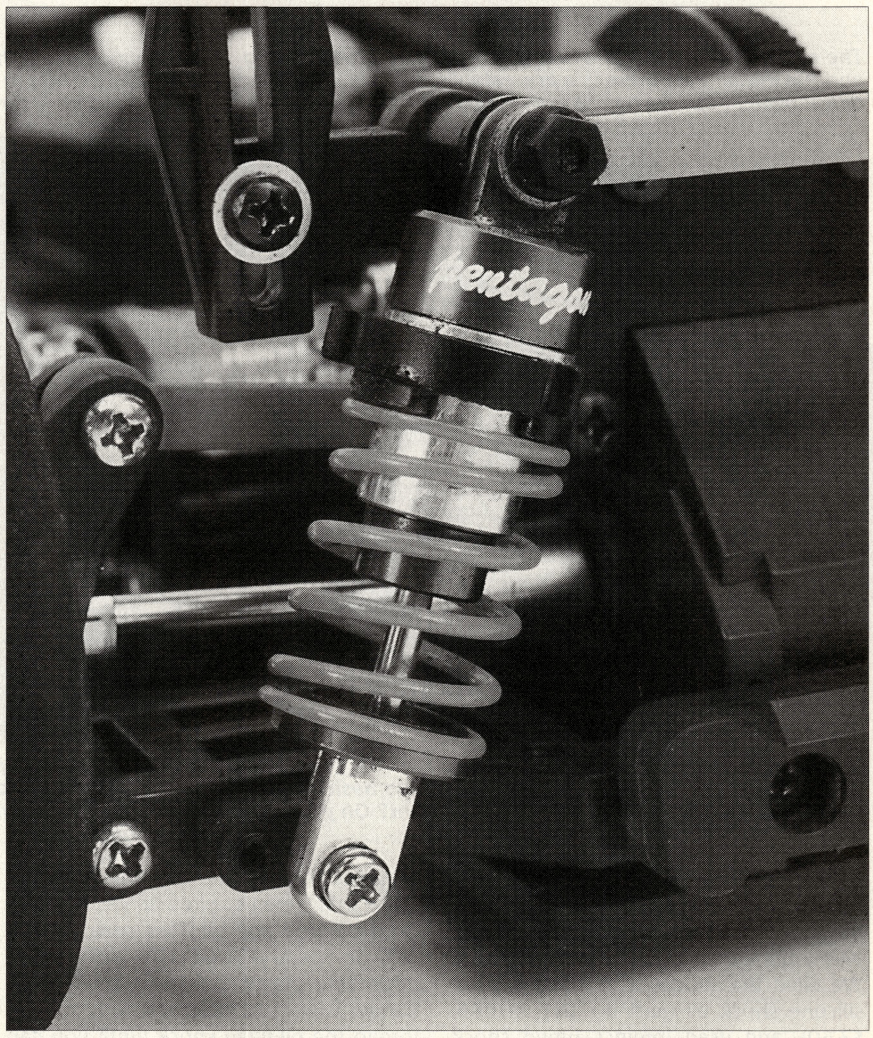
Boing, boing, boing

Okay, we now had a Corvette-like motor, but were really sliding all over the parking lot with the Geo-like suspension. During the original test of the HT1, our number one complaint was its poor shocks. All the horsepower in the world is useless if you can't apply it to the ground. The hop-up process would be completed in three separate stages. Stage one happened in the first test with our staff literally hacking two complete coils off the springs. Successful? Sorta...

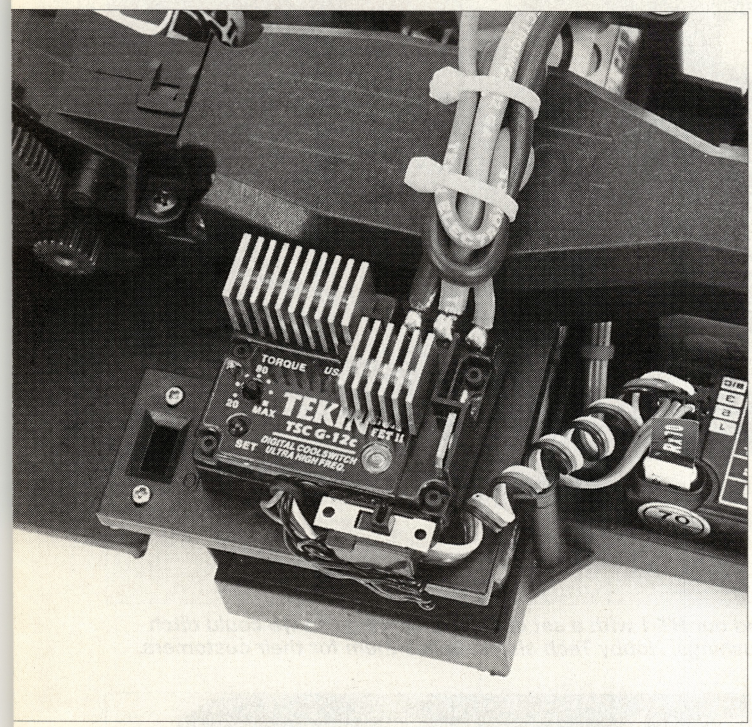
Stage two called for completely eliminating the old silver springs altogether, and opting for an after-market set. Integy sells the C22 Spec Speed-Tune Spring Set which includes a set of six tuned springs for only $15.99 (part no. C22-300). We installed the orange (medium stiffness) springs and were duly impressed. The new springs significantly lowered the overall ride-height of the entire car. In addition to establishing a lower center of gravity to help increase corner speed, some of the car's roll through corners was also eliminated as the corners stiffened up, making the car less likely to push the front end through the corners.



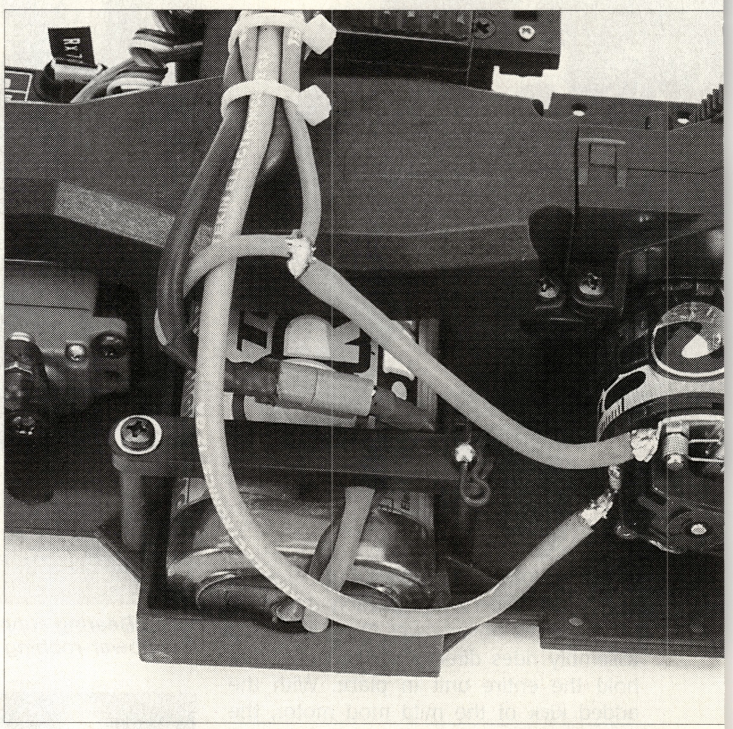
Boca Bearing supplied our HT-1 with a set of 5x10x4 bearings so we could ditch the power-robbing bushings. Hobby Tech also supplies them for their customers.



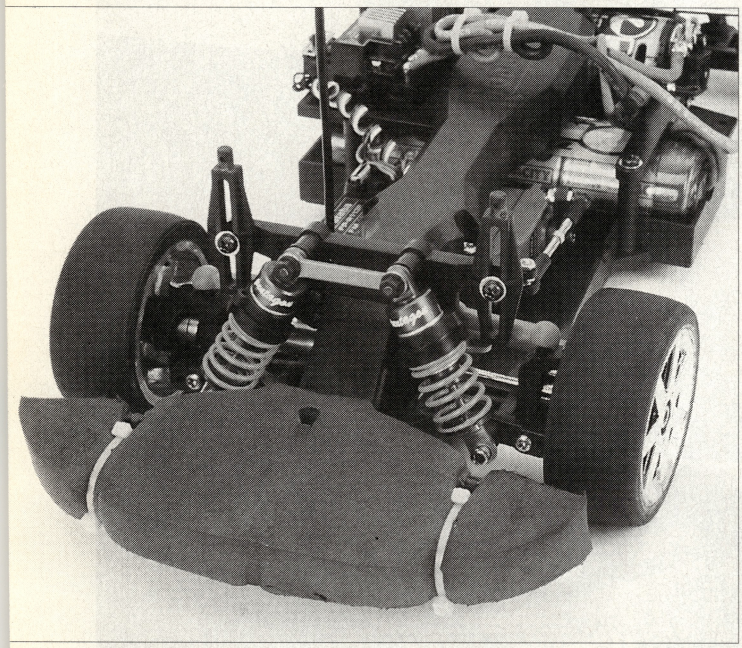
Sticker shock: The Pentagon shocks aren't cheap, but they work fantastically. Combined with Integy's medium-stiffness orange springs, we had a well-mannered car at our fingertips.



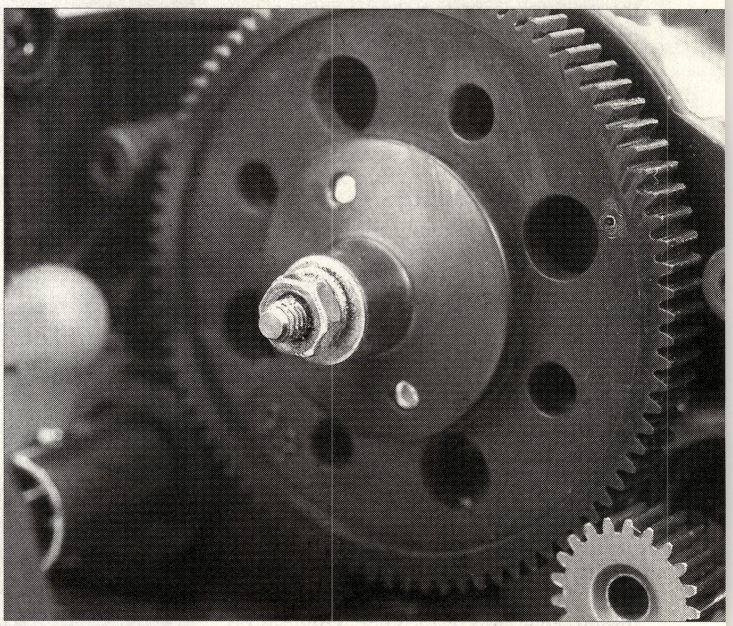
The ever-reliable: A Tekin G12 regulated juice to the steering and the motor. Yes, there is a pre-established hole for the on/off switch, but we had already glued it to the ESC earlier.



Demolition man: The side nerfs were partially sheered off with an HPI RS4 in a rough game of "tag" before being finally removed with a screwdriver.



Zip it: Crude, yes, but zip ties are effecient and besides who see's how the bumper is held on anyway, right? Oh yeah, this is for an international magazine...



Cheap and easy: Spend less than two bits and invest in some steel nuts with nylon inserts from your local hobby shop or hardware store. This will prevent the entire main drive shaft from loosening!

Stage three took our process one step further and tossed the stock shock bodies completely in favor of oil-filled, aluminum bodied ones from Pentagon. We filled the shocks with Integy's 80wt silicone shock oil (part no. INT. M1080, $3.50), and used Integy's tuned shock springs. Yes, the shocks are a tad expensive to be mounting up on a $99 car, but they really were the only things in the office that weren't bolted up yet. If you're on a budget, any oil-filled sedan shock will do. Tamiya and HPI offer more affordable plastic bodied units. If your budget is already stretched with the car, forego the oil-filled shock (until you can afford them) and spring for the tuned coils (yeah, pun intended).

Bearing down on performance

As already discussed, bushings are one of the biggest horsepower thieves in the business. There is hardly anything better to literally suck the horsepower right from your motor and battery. Hobby Tech distributes a complete set of smooth ball bearings (part no. A0901, $57.00) for the entire car. This 18-piece

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Hobby Tech HT1

kit will actually increase your run time by 25 percent or more.

If you can't afford to replace all the bushings, at least take the time to disassemble the hub carriers and replace the bushings with bearings in the wheels. Our friends at Boca Bearing set us up with a couple of sets of their new 5x10x4mm high-performance "budget" bearings (part no. MR105-ZZ). These sell in sets of four per package for only $6.95 and increase performance with decreased slop in your steering, while elevating the run time of your vehicle as well.

Get in, sit down, and shut up!

Driving the HT1 is actually a blast. The stock "Goodyear" branded tires do an excellent job hooking up on asphalt with the silver can motor, but are stressed a bit with the mild mod. Traction additives help if the surface isn't too dusty. (Try using WD-40, spray it on a rag and wipe the tires down with it. Then let it dry for ten minutes).

Before heading out for serious jousting with curbs and parking blocks, pick yourself up a foam bumper to help save the nose of the car. Integy also supplied us with this one which we "MacGuyver'd" on with zip ties. After several serious hits up front without foam, you'll start snapping things off. We tore the stock side nerf bars completely off in rather heated game of "tag".

Lastly, even though the kit comes with something resembling thread-lock on the retention screws on the outdrives, remove them and replace with a real brand name product. Once one of these little babies back out, you're instantly reduced to two-wheel drive. ◆

SOURCES

Boca Bearing, 7040 W. Palmetto Pk., SE, Boca Raton, FL 33433 ● (800) 332-3256; (561) 998-0119

Deans, 7628 Jackson St., Paramount, CA 90723 ● (562) 634-9401; (562)634-9403

Hobby Tech, 1139 Colner Ct., City of Industry, CA 91748 ● (626) 810-2585; (626) 810-5153

Hot Bodies, 308 Serrano Trail, Browns Mills, NJ 08015 ● (609) 893-7716; (609) 893-2639

Integy, 1140 Centre Dr., City of Industry, CA 91789 ● (909) 444-2766; (909) 444-2767

Multiplex USA, 14751 Calvert St., Van Nuys, CA 91411 ● (818) 785-2401; (818) 785-3946

Orion, distributed by HPI, 15321 Barranca Pkwy., Irvine, CA 92618 ● (949) 753-1099; (949) 753-1098

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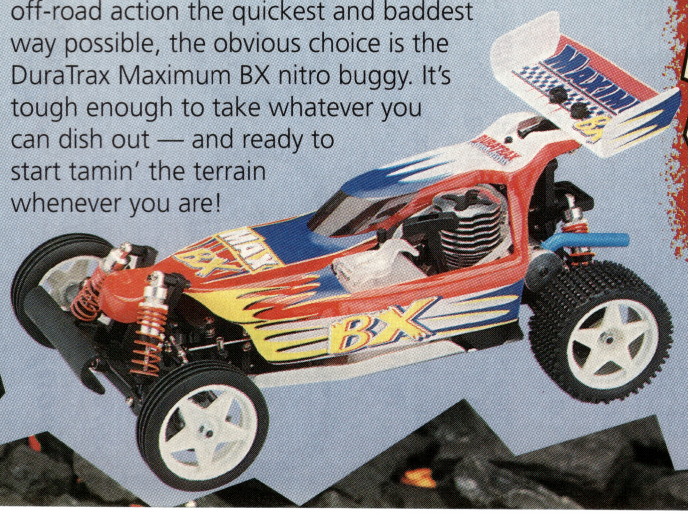

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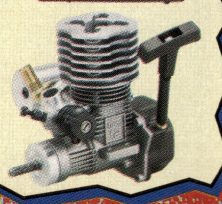

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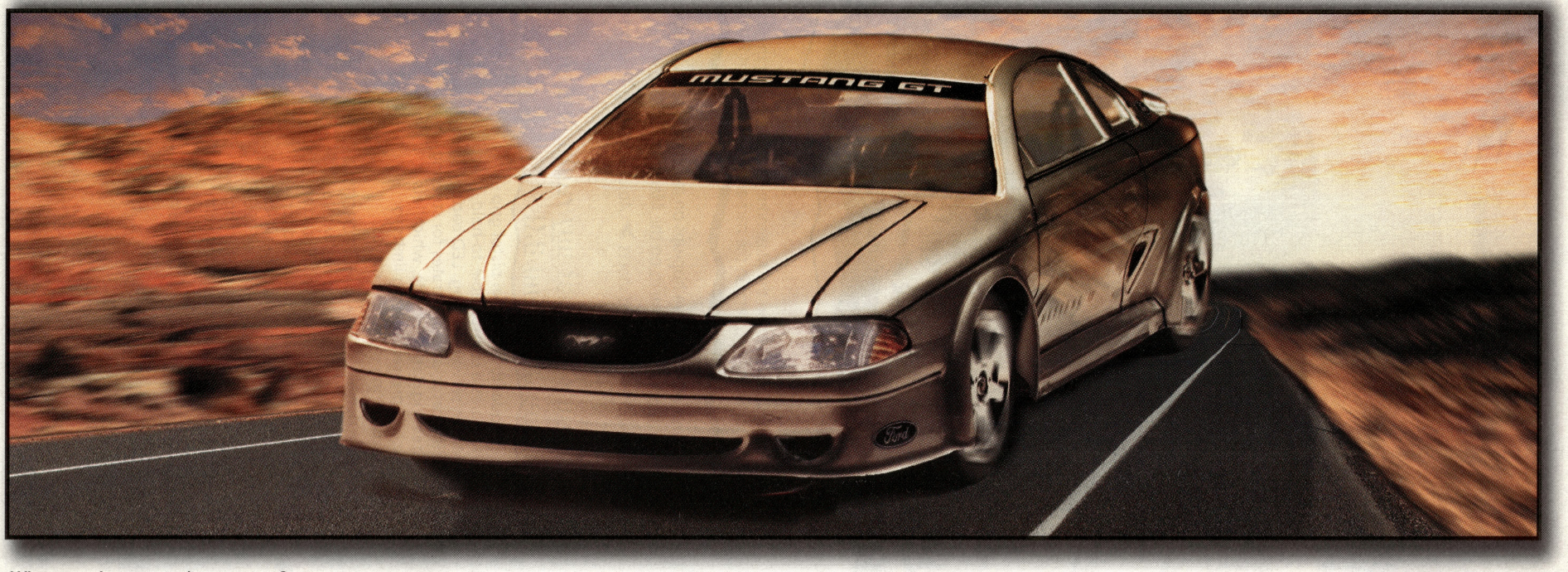

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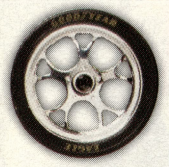
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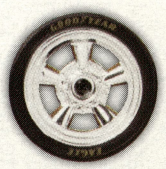
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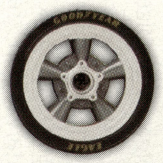
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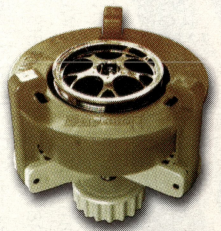
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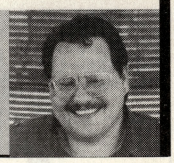


Fix it before it breaks!

Well, it's that time again! It amazes me how fast the deadline rolls around for this monthly column. It seems like I just sent in the last one a few days ago! Instead of focusing on one particular subject this month, I thought that I'd touch upon several. Maybe this month's column should be entitled "How to Win!"

So, how do I win races?

I have been asked this question many times, and the answer I always give is simple—preparation! Driving skill is, of course, a major part of this equation, but if the car does not stay running, no driver—no matter how good—can make up for that! Before each race I perform a complete and systematic service of the race car. By "systematic" I mean that I follow the same procedure each and every time so that I won't forget to check or service every important component of the car. In an earlier column (August '99) I wrote about trying to diagnose every part failure and how to prevent it from happening again! Was the failure caused by abuse (a hard crash, etc.) or defective or poorly designed components?

If the failure was caused by defective parts, I most likely will inspect the replacement parts more closely the next time. If the failure was caused by a hard crash or from a poorly designed part, I check to see if I can replace the part or parts with a stronger optional or aftermarket piece.

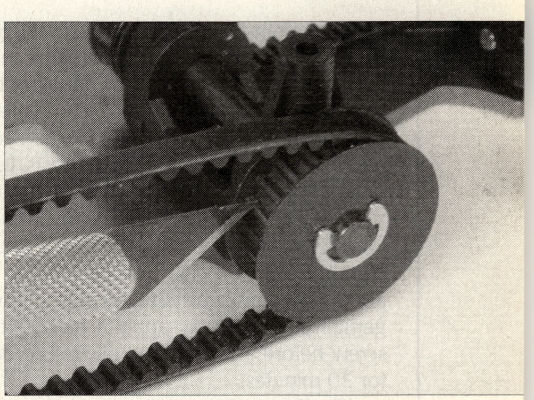
Choose parts wisely

Always use caution before you choose to install an optional or aftermarket part. Remember, just because an optional part may fit, it does not mean that the new part is automatically better or stronger. Look closely at the part and ask yourself these questions: is the part a direct replacement? Will it effect the geometry or actions of the part it is replacing? If it is a stronger component, does this mean you may be transferring the breakage problem to another component (by effectively moving the weak link to a different area of the chassis)?

This may make repairing crash damage more complex and/or expensive. Example: you replace an inexpensive suspension upright or arm with a heavy duty unit. Now upon crashing you find the impact transferring to the bulkhead, which breaks instead! Now you may have to replace a much more complicated component! Let me point out this is only an example and I'm not implying optional parts are not beneficial—many are excellent upgrades. This is a basic guideline, so try to take note of any failures you encounter and try to work "correcting and inspection" into your racing program.

When to check

Normally I perform my inspection before each race day and before the main event. Here's how I perform the inspection/correction:



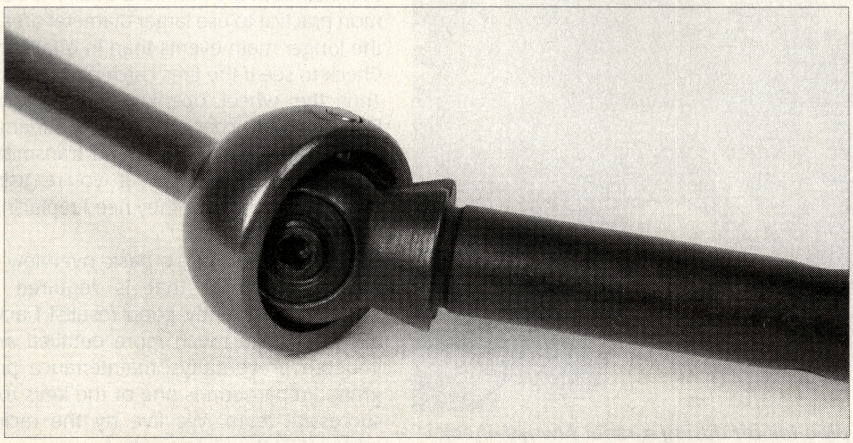
Getting into the habit of checking your car's belts and pulleys after each run is a good way to prevent damage caused by small pebbles that can become lodged in the pulley teeth.

(1) The first thing I look for is obvious crash damage and correct as necessary, and this includes replacing damaged or cracked parts.

(2) Next, I check all the normal wear items like pulleys and belts. Pay particular attention to built-up dirt, grime and rubber in the pulley teeth (I check these before every run on tracks that are dirty or have high tire wear). Most belt and pulley failures are caused from debris build-up in the pulley teeth, which causes the belt to slip.

(3) Driveshafts! This next item is one of the most overlooked and the cause of many ill-handling race cars. Be sure to inspect all dogbones and drive cup/axles (even U-joints and CV-joint style driveshafts). All of these types of driveshafts use a ball and pin drive on the inside end. What happens is that the drive pin will wear a notch in the drive cup or axle. What many racers do not realize is that when the suspension travels up and down, the dogbone must slide in and out of the drive cup/axle! If there is a notch, the drive pin will tend to "lock" into the notch when power is applied, preventing the driveshaft from sliding in and out as the suspension operates. The end result is a car that unexpectedly kicks or spins out when you apply throttle! Here's a tip: clean and lubricate the cups/axle frequently with a high quality, thick grease.

(4) Be sure to check all the nuts, bolts, screws and clips. Many races have been lost because a setscrew came loose on a drive pulley or one of the chassis screws worked its way loose and began dragging the ground! Do not forget to check the screws that hold the servo saver and servo horn to the servos. Whenever possible, use



After every three or four runs, make a habit of checking your car's driveshafts for loose parts. On these MIP CVD driveshafts, you should periodically make certain that the tiny setscrew that holds the pin is tightened securely.

medium-strength thread-lock (sparingly). WARNING: many racers do not realize that normal blue and red Loctite (anaerobic-type thread locker) are not compatible with plastic (i.e., it can eat the plastic!). For metal screws that go into plastic parts, use only a cyanoacrylate-type thread locker such as Loctite 425. TIP: sometimes finding a cyanoacrylate-type locker (not to be confused with CA glue) can be difficult. A good light-duty substitute is common fingernail polish! Simply apply a dab to the screw before installing and allow it to dry for 30 minutes.

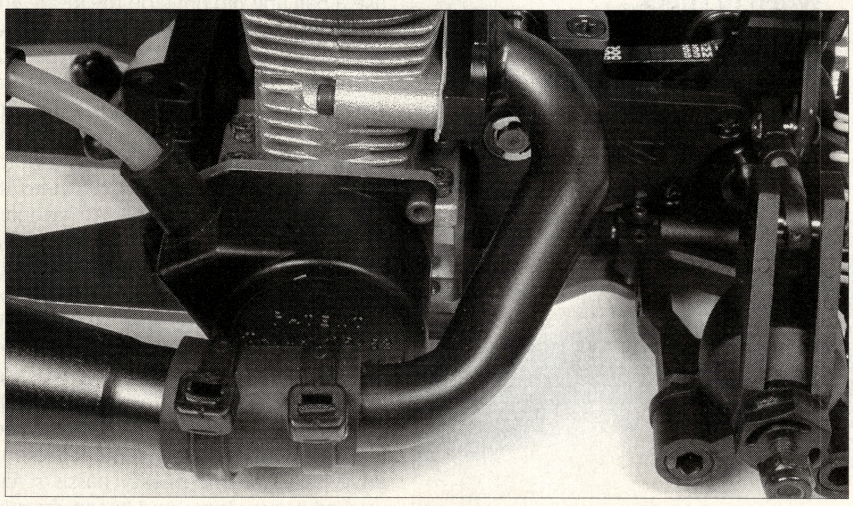
(5) Check the gearbox/transmission and clutch assembles. Look closely at the plastic gears; are they worn or chipped from use or from being fouled by rocks and debris? Check the gear mesh carefully. Check the backlash (the amount of back and forth slop or clearance between the gear's teeth) of the pinion and plastic drive gears. Rotate and check the gears in several positions (it is common for the plastic gears to not be perfectly round. Set the gears' mesh with the least amount of backlash possible without causing the gears to bind or to operate noisily.

(6) The clutch should be checked as well, including the clutch shoes or disc, ball bearings, thrust bearing (if equipped), and all adjustments as per your kit's instructions.

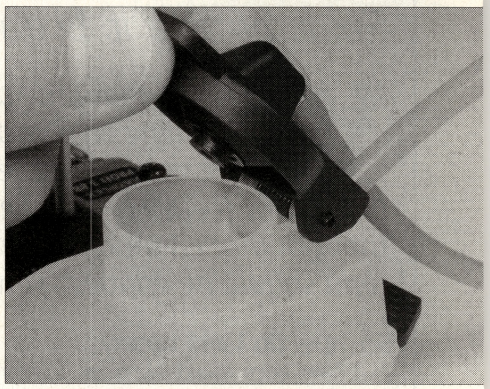
(7) The exhaust should never be overlooked. Another common failure is the exhaust system coming off during the race! Be sure the gasket or O-ring (if used) that seals the manifold to the engine is in good condition. Be sure everything is dry and clean. If the manifold is held in place by screws (as is the case with most .12 and .15 small block engines), be sure to re-torque them regularly. If the manifold is held on by a spring (as with most .15 big blocks and .21s), think about how long the spring has been in use. Springs will eventually suffer from metal fatigue and break. I replace my manifold springs after every four to five hours of use. TIP: In most applications with springs, there is room to drill another set of holes on the manifold—this allows you to use two springs instead of one to ensure that the manifold will stay put even if one spring fails.

The silicone rubber hose or coupler that connects the pipe to the manifold is possibly the number one cause for black flags and lost races! If the hose is cracked, split, swollen or burnt from continuous use, it is time to replace it! Be sure there are no burrs or sharp edges on the manifold or pipe that will nick or cut the silicone hose. Silicone is great stuff—it is heat and oil proof—but not very abrasion resistant (the slightest nick or cut will quickly turn into a rip or tear!). Silicone also gets extremely slippery when you get oil on it. The trick is to be sure the pipe manifold and coupler are clean and oil free when you install them. It is imperative you respect the correct exhaust length when you make the connection. Use high quality tie-wraps and secure the hose firmly.

(8) The fuel system should get a once-over. Check the fuel and pressure lines for cracks, splits or pin holes, check any in-line filters to see if they need cleaning as well as for leaks. Don't overlook the tank seal or O-ring (check for leaks).



Few things are worse than having your pipe fall off during a race! Always check the coupler that joins the manifold to the pipe, making sure that the tie-straps are nice and tight. Also, check to see that the manifold is securely held to the engine case.



When giving your nitro car a once-over, it's a good idea to check the condition of the fuel tank (including the lid's seal) and fuel lines for leaks. A leaking fuel system will cause your engine to run erratically and may even cause damage by over-leaning the mixture.

(9) Tires and rims should be part of your pre-race inspection. No matter if your racing with molded rubber tires (as in sedan on road, buggy off road) or with foam tires, tires are the single biggest advantage or disadvantage in on-road racing! Check the tire edges closely and be sure the tires are still completely glued to to the wheels. I always try to have a several sets of wheels and tires ready to go. This will allow your pit man to make a change during warm-up so you can try several types during practice. For the final event we always have a spare set ready to go in case we encounter a problem.

(10) Even the body shell should be inspected. If the holes around the body posts are ripped or cracked, add some thin plastic washers (you can also fabricate these from scrap Lexan). Be sure the body posts themselves are securely attached to the chassis. In the foam tire class, it is common practice to use larger diameter tires in the longer main events than in qualifying. Check to see if the tires catch on the body. Trim the wheel openings if necessary. Don't forget to check the wing mountings!

(11) Are your receiver and transmitter batteries fully charged? If you're using alkaline batteries, do they need replacing?

The above is just a basic overview of the maintenance that is required to achieve consistently good results! I actually perform a much more detailed and in-depth preventative maintenance program. Preparation is one of the keys to a successful team. We live by the racing adage "Effort equals results."

C-ya next month,

Ron ♦

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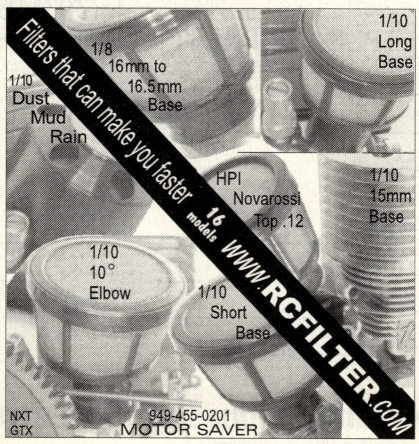

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INSIDE THE IFM WIN CA



You're looking at the two best off-road racing machines in the world right now. Jukka Steenari's IFMAR winning Orion-powered 4WD Team Losi XX4, and Masami Hirosaka's 2WD title-holding Reedy/Yokomo-powered Team Associated RC10B3.

Both racers faced the stiffest competition the world has to offer, and came out victorious. Each man's machine had to be perfect to make it to the finish line first. As you'll quickly see, there are two different trains of thought at work here regarding their cars—the Losi XX4 of Jukka Steenari features some of the

AR OFF-ROAD NING RS



most technologically advanced work that Team Losi has to offer. It is a highly advanced piece of machinery and Jukka's car is equipped with some of the best parts available—a true race car in every way. Masami's RC10B3 is also a full-blown race machine, yet on the other hand it is the ultimate statement of simplicity. The car is decked out with standard plastic composite chassis, suspension arms, and even a stock fiberglass front shock tower! Equipment aside, it was the drivers themselves that piloted these machines to the winner's circle—without them, they'd just be cars sitting on the starting grid. It takes nerves of steel to win a World Championship—just ask any racer attending an event of this magnitude. And while we can't bring to you the raw nerve that makes these competitors who they are, the very least we can do is give you an inside look at the machinery that beat out the world's best—enjoy!

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R/C CAR

TEAM LOSI Racing



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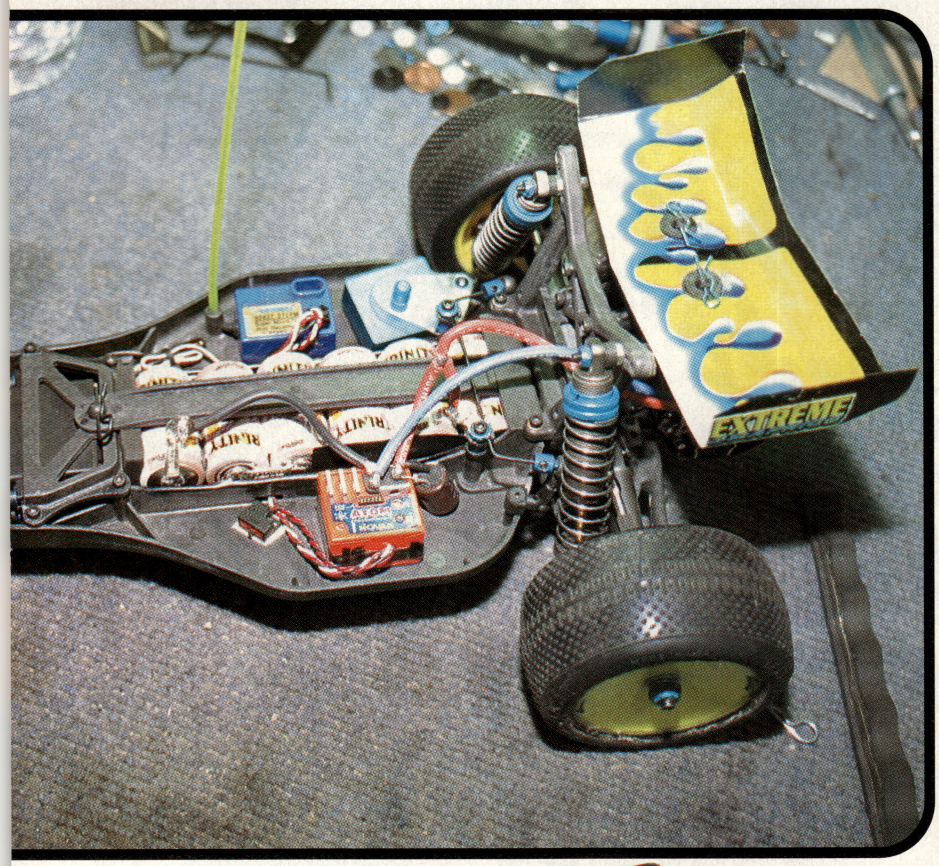



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INSIDE THE IFMAR OFF-ROAD WINNING CARS

Jukka Steenari's Winning Team Losi XX4

Front Suspension:
Toe-in/out—1° negative
Front ride height—Bones just below level
Front camber—1° negative
Sway bar—No
Camber link—Bulkhead #1, two gold washers under ballstud

Front shocks:
Oil—25wt Losi
Piston—57 black
Spring—Orange: 1.5 coils cut down
Limiters—Inside: spring, outside - none
Mounting—two, inside
Turnbuckles—Lunsford

Rear Suspension:
Pivot support—3° inboard toe-in, 2° anti-squat
Rear ride height—Bones level
Rear camber— 2° negative
Sway bar—Yes, 1.6 mm thick
Camber link—5.5/B

Rear shocks:
Oil—37wt
Piston—54—one hole drilled to 1.7 mm
Spring—Yellow
Limiters— Inside "A", outside 2 "B" spacers
Mounting— four/outside
Turnbuckles—Lunsford

Electronics:
Radio—Airtronics M8
Receiver—Novak XXL
Steering servo—Sanwa ERG-ZR
ESC—Novak Cyclone
Cells—Team Orion V-Max
Motor—Team Orion Chrome Modified 9x2
Pinion—17
Spur—86

Tires:
Front— Losi Taper pin (Yellow compound)
Rear— Losi Taper pin (Yellow compound)

Miscellaneous:
Battery placement—Forward
Body painted by—Mikko Aarras
Hot weather body
Stock 4WD wing
New wide Losi rear wheels
Transponder mounted to the back of the body
Lowered Graphite composite Stiffizell chassis
Plastic outdrives front and rear
Slipper used
Stock driveshafts (rear alloy)
Hubs centered ●




28
TEAM LOSI
ORION
Modified

INSIDE THE IFMAR OFF-ROAD WINNING CARS





A few words with 4WD Champ Jukka Steenari

R/C Car: Jukka, congratulations! What was going on in your mind in the second A-main as you were nearing the finish line?

Jukka: I was amazed that I was able to pull out the win in that main, since earlier in the race I dropped to 3rd place.

R/C Car: The Finnish racers were very much a force at this event-even though there was no early practice time on the track for any of you to take advantage of. We also heard that there really aren't any placed in Finland to race off-road. How do you guys get so fast!?

Jukka: That's a question I have never been able to answer. Why is Mika Hakkinen the F1 World Champ? Why do Finnish drivers rule the World Rally Car racing?

R/C Car: This win was obviously very important to Team Losi-what was their reaction when you brought them their first 4WD title?

Jukka: They were naturally really happy about it. We have worked hard together to achieve this goal. That's why this win feels very special as it is a result of a team effort.

R/C Car: Does this race have more significance to you considering it's the last race of the century?

Jukka: Not really, although, if you think about it: "Nineteeeeeeniinety nine World Champion!" sounds a lot better than "Two thousand one World Champion" .....:)

R/C Car: Who was your toughest competitor in the event?

Jukka: Brian Kinwald; he was fast and most consistent through the whole meeting

R/C Car: What's next on your agenda? Any big races? When will we be seeing you again in the States?

Jukka: Next important race is the off-road Eurochamps in Austria. The next time you will see me racing in the states is probably the Reedy race in January.

R/C Car: Finally, is there anyone you'd like to thank?

Jukka: I would like to thank all my sponsors for their superb support; without you this would not have been possible! Team Losi, Team Orion, Novak, Audi Sport, Sanwa, Genera, MIP, and Lunsford. I'd also like to give special thanks to Maija-Riikka Kettunen, Mikko Aarras, and Paul Worsley. ◆

A few words with 2WD Champ Masami Hirosaka

R/C Car: Congratulations Masami, how do you feel right now?

Masami: Cold... (*laughs* as he stands there soaked with champagne)

R/C Car: Tell us what was going through your mind entering the last A-main?

Masami: I was out of my mind—my mind was clear. I wasn't thinking of anything—just trying to concentrate.

R/C Car: Did you see what happened between Mark and Brian going into the doubles at the beginning of the last main?

Masami: I noticed that they crashed but I didn't know why.

R/C Car: Just so we can give our readers some insight as to how good a driver you truly are, would you please tell us exactly how many times you've raced off-road since you won the 4WD IFMAR Off-Road title in Pomona two years ago?

Masami: Only two times…actually I raced a few more club races too. So probably five all together.

R/C Car: So then how did you win a race of this nature with only having raced off-road only five times in the past two years?

Masami: The Team Associated B3 is great—because of the car. I've also been racing touring car a lot so that helps quite a bit.

R/C Car: So, how many IFMAR titles does this make in your collection?

Masami: 10!

R/C Car: How does it feel to win the last IFMAR title of the 1900's—is this more special than any other?

Masami: It is more important to me that this is my twelfth title in a row. I have won at least one IFMAR title every year since I won my first one in 1987.

R/C Car: So what big race is next for you?

Masami: In two weeks there is a Pro10 National title race in Japan and I will be racing in that event.

R/C Car: Well, congratulations again Masami, and good luck at the Pro10 Nationals.

Masami: Thank you very much! ◆

R/C CAR BACK ISSUES



❑ APR. '98
HPI, RS4 MT; Team Associated RC10B3; Tamiya TA03F David Jun Special; Team Losi XX Kinwald Edition; Tamiya M02L Mercedes SLK; Tamiya TAO3R Nissan R390GT1; how to clear big jumps; rebuild your tranny; *R/C Car* glossary; JR R-1 vs. Airtronics M8; Tekin BC112c digital peak charger; Novak Rhino DC peak charger; Trinity IFMAR off-road worlds video; Comp Art truck tire washer; KO Propo EX-11 Presto radio; HPI RS4 Pro Electric touring car (part 1); Team Losi XX-4 4WD off-road buggy (part 1) OFNA Z-10 pro electric touring car.

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Kyosho Nitro Mini-Cooper; Tamiya Blazing Star; Yokomo YR-4 MS USA version; Traxxas 4-Tec; Mugen Prime 12; Team Losi XX-4 Racing Truck; Innoventive Technologies CVEC tuned pipe; Motor Saver filters; PC/RC EFR; Reedy International Race of Champions; how to build battery packs; Kyosho Rally cars; KO Propo EX-1 Mars FM radio; PROTOForm Volvo S-40 touring body; Tekin DIS-350 battery discharger; Racers Edge diff building board; Team Associated RC10T3 (Part 1); HPI Nitro Mini (Part 1); Tamiya M02l.

❑ JUNE '98
Kyosho GP-10 MK. II Spider; Schumacher Cat '98; OFNA Racing Nitro Z-10 HPI RS4 Mini; Kyosho Inferno DX II; SRP Spectre; Bennett vs. ESP Clods; '98 Team Losi Winterchamps; Airtronics anti-lock brake booster; Cross Racing JOMO Nissan Skyline GT; GM Racing Super Glue; Tekin G-10 PRO ESC; Hitec Lynx FM Radio; Schumacher '98 Spec S.S.T. 2000 (part 1); Team Associated RC10B3 (part 2); Team Losi Double-X Kinwald Edition (part 2).

❑ JULY '98
MRC Nitro Thunder King; Traxxas Nitro Sport; Kyosho ATV Quad rider; OFNA Pirate 10 SE Porsche; Kyosho Formula 10; Team Losi XX-T 'CR' Graphite; Team Losi XX-4 (part 2); Tamiya M02L (part 3); Futaba 3PJ FM/PCM radio system; Roland Digital Group Sitka; Schumacher gauge set; Dirt Bagz Battery Caddy; Robinson Racing bearing cleaner; GM Racing V-12 ESC.

❑ AUG. '98
HPI Nitro RS4 Racer; Tenth Technology StreetWise Stadium Truck; Thunder Tiger Twister; Yokomo MX-4; Team Associated Nitro Dual Sport; Team Associated Nitro Dual Sport; inside the Silver State Nitro Challenge Winners; Setting your suspension; 12 ways to go faster!; inside the Pro-Line Cactus Classic; Factory Works Motor Centering Kit for Losi vehicles; MIP Thorpe Wrenches; Futaba Magnum Sport and Magnum Junior Radios; Progressive Suspension EDC Shocks; Schumacher CAT '98; Team Associated RC10T3.

❑ SEP. '98
Trinity Switchblade 12sj; Schumacher Fireblade USA; Tamiya Golf VR5; FSR Bullet; Kyosho SuperTen McClaren; GTR F1; Thunder Tiger Mirage V-Spec; which scale is for you?; how to care for your modified motor; project Dirt Oval Nitro Sport; MIP 4-N-1 Clutch; RPM Tire Gluing JIG; Hitec CG-330 Charger; Trinity Touring Car Tire Tamer; OFNA starter box; Dynamite Glow Tuning Screwdriver; Team Losi XX4 (part 1); Team Associated RC10GT (part 1).

❑ OCT. '98
Kawada SV-10 Alcyon; Tamiya's PIAA Porsche & Mercedes CLK GTR; Schumacher Nitro .21 Xtreme; Kyosho Nitro Blizzard; Tamiya Volkswagon Beetle; ROAR Off-Road Fuel Nationals; understanding swaybars; 10 beginner problems; OFNA car stand; Performance Hobby Jack Stand with Lite Switch; Novak Atom ESC; JR Racing XR2 AM Computer Radio; Trinity Monster Stock Jr. Stock Motor; HPI RS4 Pro; Team Losi Kindwald Edition

❑ NOV. '98
HPI RS4 Rally; MRC Nitro Thunder King; HPI Mini Pro; Team Associated L3; Tamiya Ferrari F310B F1; Tech Racing Voggerd GT; Kibrough/BSR Oval Shootout; Mark Pavidis' new Mugen MBX-4; building a track; turn marshalling rules; Tamiya Championship Series; RPM Ride-Height gauge; Dynamite Ultra-Start starter box; Tekin Pro Motor Dyno; Traxxas Nitro Sport.

❑ DEC. '98
Kyosho TF-3 Type-R; Tamiya M0-3 Cooper; Kawada SV-10 Alcyon; Tenth Technology Streetwise Mercedes; Tamiya TGX-Mk. 1 TS; painting Lexan bodies; roll center; Novak Pit Wizard; 12 uses for fuel tubing; '98 ROAR mod Nats; Driving the ROAR off-road winning cars; JR-Propo R1 Radio; Schumacher CCD charger/discharger; Kyosho MP-5; Schumacher Fireblade USA.

❑ JAN. '99
Traxxas Nitro 4-tec; Kyosho QRC-SV Mooneyes Street Van; Thunder Tiger TA02 Nitro Conversion; OFNA Nitro Z-10 Pro; Tamiya TA03R Mobil 1 NSX; Team Kinwald Pro Shock bushings; RPM Bearing Blaster; Tamiya tire gluing jig; Racers Edge shock piston drill set; IFMAR OnTrack World Championships; Dynamite's New 12 S and 12 SPD Engines; ROAR On-Road Fuel Nationals; off-road tire tuning; HPI Viper Cup; First Annual Labor Day Shootout

BACK UP!

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INSIDE THE IFMAR OFF-ROAD WINNING CARS

Masami Hirosaka's Winning Team Associated RC10B3

Front suspension:
- Front carrier block—25°
- Front ride height—Arms level/down
- Front camber—2° negative
- Toe-in/out—Neither toe-out or toe-in
- Anti-roll bar—None

Front shocks:
- Oil—35wt Associated silicone oil
- Piston—1-hole
- Spring—Blue
- Limiters—None
- Shock shaft—.71 "Unobtanium"
- Mounting—Outside hole on tower, inside hole on arm
- Camber link—Inside hole on tower
- Kingpin ballstud—Centered
- Turnbuckles—Factory Team parts

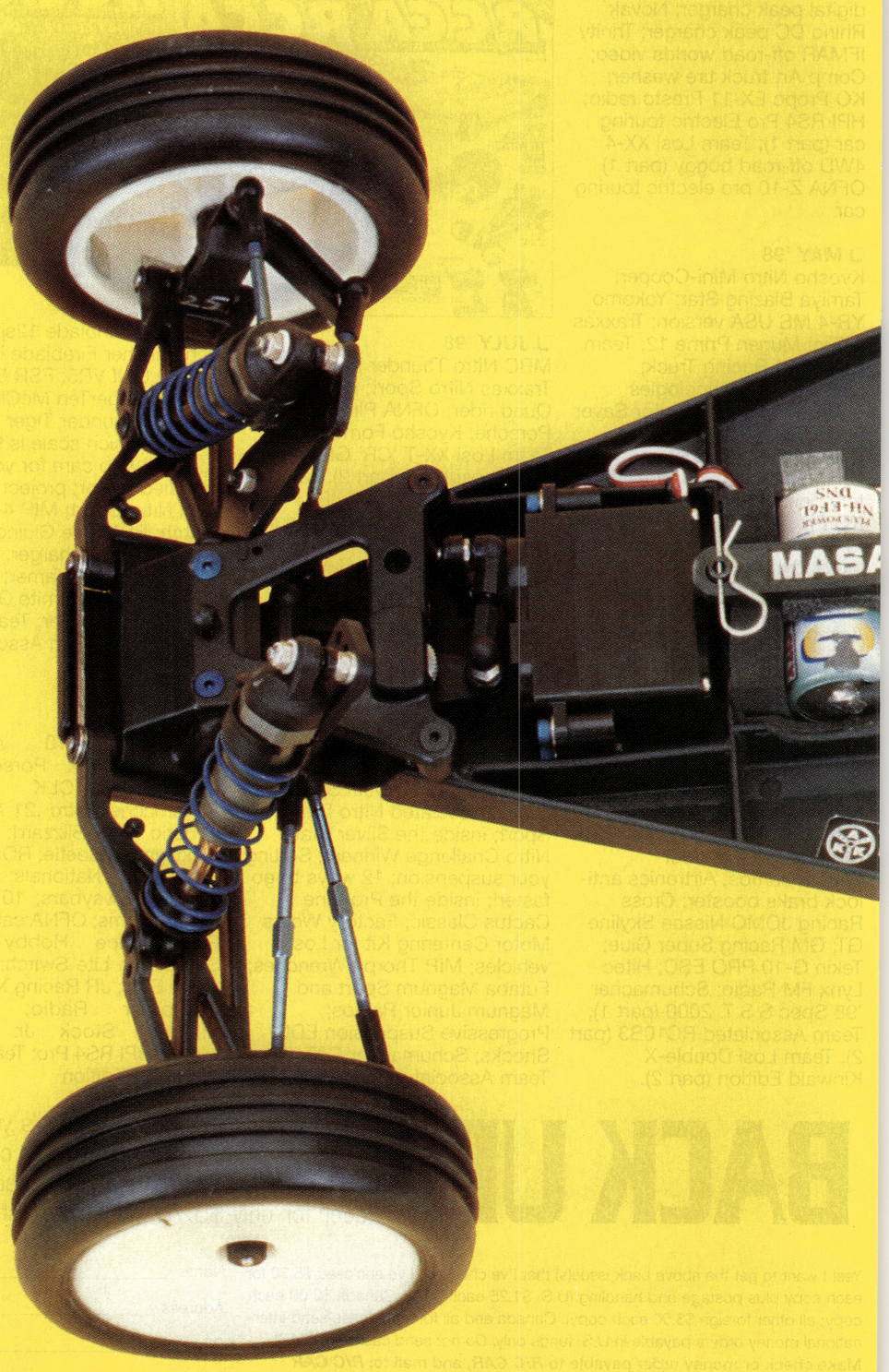
Rear suspension:
- Suspension mounts—3-3
- Wheel hub—Spaced forward
- Rear ride-height—Universals level
- Anti-squat—3°
- Camber—2° negative
- Anti-roll bar—None

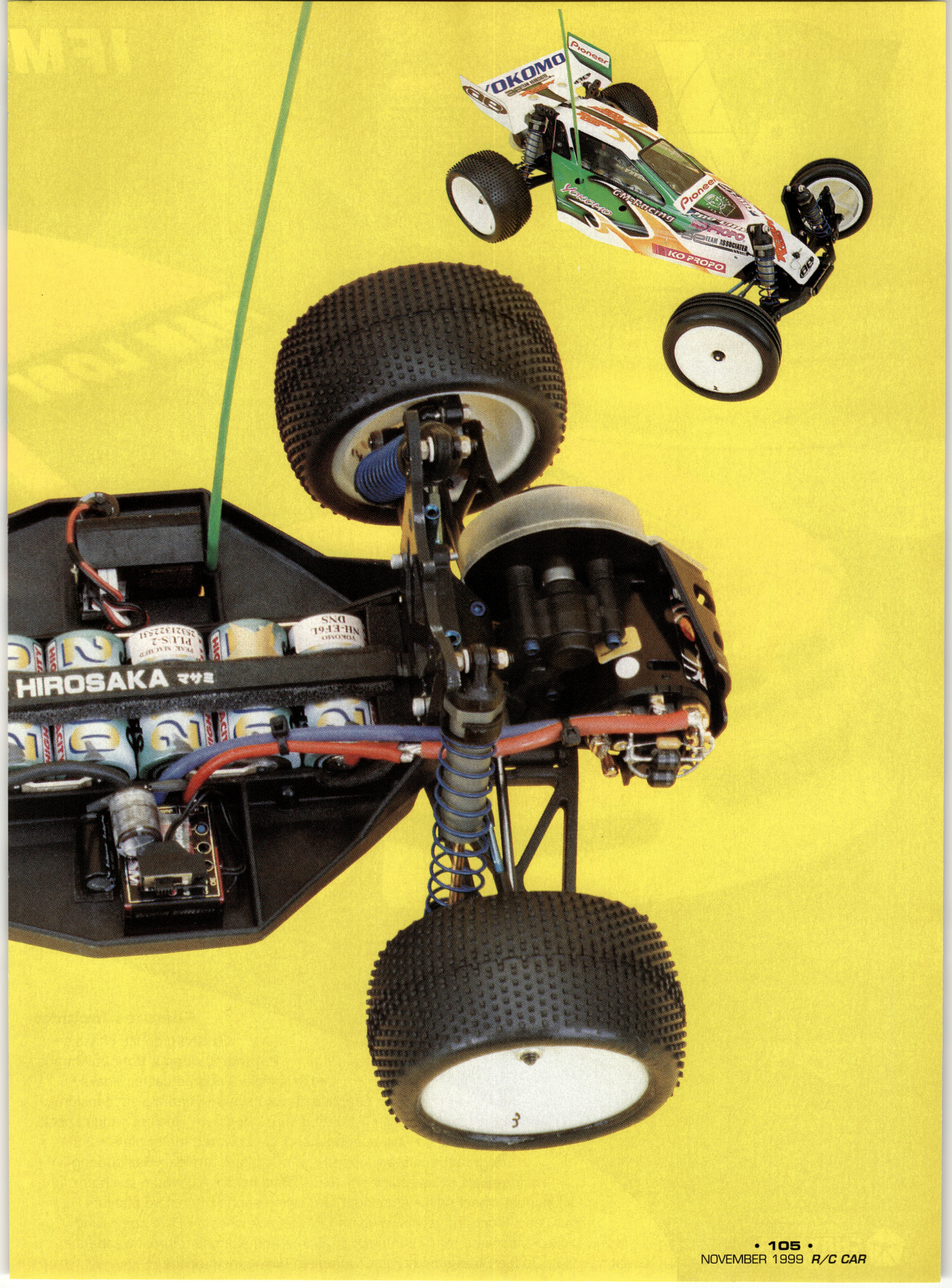
Rear shocks:
- Oil—30wt Associated silicone oil
- Piston—1-hole
- Spring—Blue
- Limiters—None
- Mounting—Middle hole on tower, outside hole on arm
- Camber link—Inside hole on hub, inside hole on bulkhead
- Turnbuckles— Factory Team parts

Electronics:
- Radio—KO Propo
- Receiver—KO Propo KR-297FZ
- Steering servo—KO Propo PS2000 FET
- ESC—GM Racing V12
- Cells—Yokomo 2000mAh
- Motor—Reedy Sonic II 93 (9x3)
- Brushes—Reedy 760X
- Pinion—17-tooth
- Spur—81-tooth

Tires:
- Front—Pro-Line: New rounded rib (M3) on Pro-Line Wide Ones wheels
- Rear—Pro-Line: Holeshots (M3) on Pro-Line wide rear wheels

Miscellaneous:
- Chassis—Standard composite
- Suspension arms—Standard composite
- Front shock tower—Standard fiberglass
- New shock tower—Ran standard geometry instead of new geometry
- Battery placement—Placed in the center
- MIP Aluminum CVDs
- Masami applied slick chassis protector tape to the bottom of the chassis ●

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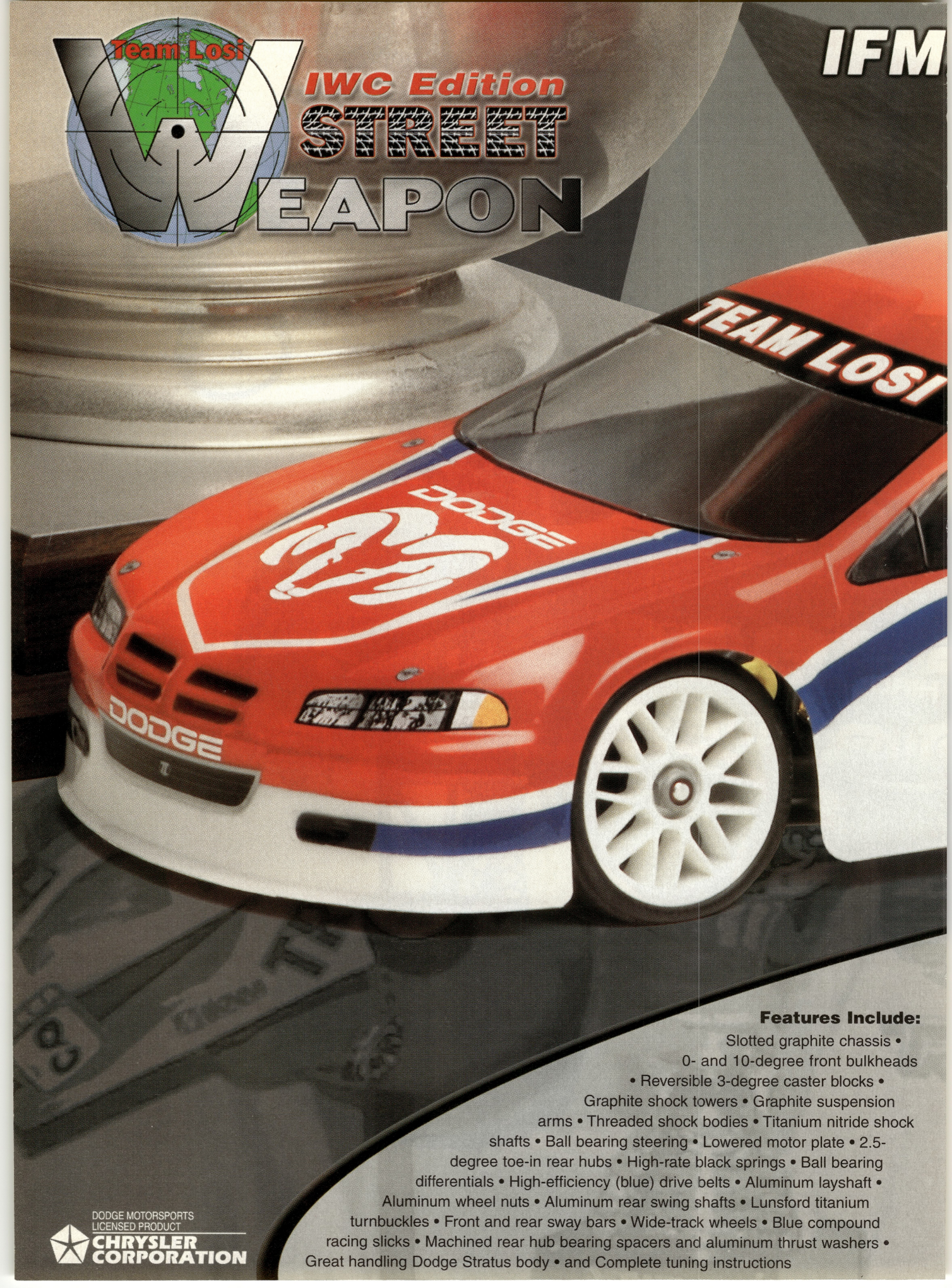
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Driver Not Included

What's the IWC stand for? It stands for IFMAR World Cup - the event that Team Losi Street Weapons dominated. Not only did Team Losi win the team competition, but Street Weapons swept the top three positions. David Spashett took the win, followed by Josh Cyrul and Joel Johnson. As if that weren't enough, Ryan Coxall also brought home the victory in the independent class with a Street Weapon.

The IWC Street Weapon has proven to be a winner on any surface. It has won ROAR National Championships on both carpet and asphalt, indoor and outdoor. From parking lot to purpose-built track, there's no stopping the IWC Edition Street Weapon.

The IWC kit includes everything found on these winning cars in one convenient package. Take a look at the list to the left for just a taste of what you'll find packaged in the kit. There's nothing else left to add as an option. Basically the only thing that we couldn't include from the winning package was IFMAR World Champion David Spashett. But with a competition-pounding package like this, you'll be driving the IWC Edition Street Weapon to the winner's circle in no time.

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526 to 547 at 20 amp, 350 to 364 at 30 amp*

These cells have been put through our VIS EX-TRA voltage increasing system and are "Real Time Cycled" before matching to condition them to the loads they will see in actual on track competition. Cells come unassembled with all matching data on each cell. Outside of box shows the lowest cell in the pack with the 30 amp matching numbers as well as 20 amp numbers for easy cell comparison to cells matched at the older 20 amp standard.

NR3004 4 Cell VIS EX-TRA Ni-MH Matched Pack	$66.00
NR3006 6 Cell VIS EX-TRA Ni-MH Matched Pack	$99.00

VIS EX-TRA TEAM SPEC

548 to 556 at 20 amp, 365 to 370 at 30 amp*

NT3004 4 Cell VIS EX-TRA Ni-MH Matched Pack	$79.99
NT3006 6 Cell VIS EX-TRA Ni-MH Matched Pack	$119.00

VIS EX-TRA RACE SPEC ASSEMBLED

Same cell quality as above but assembled into battery packs. The stick packs come with clear shrink so the battery matching labels are clearly visible. The side by side and saddle packs are "Pro" assembled by our in house racers with low resistance Lennon lugs.

NR3006A 6 Cell Matched & Assembled In 6 Cell Stick	$109.99
NR3006S 6 Cell Matched, Pro Assembled, Saddle	$114.99
NR3006X 6 Cell Matched, Pro Assembled, Side X Side	$114.99

VIS EX-TRA TEAM SPEC ASSEMBLED

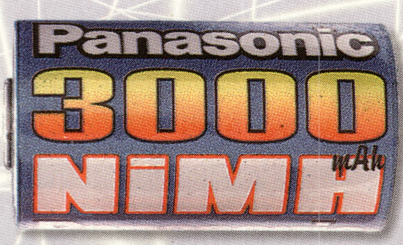
NT3006A 6 Cell Matched & Assembled In 6 Cell Stick	$129.99
NT3006S 6 Cell Matched, Pro Assembled, Saddle	$134.99
NT3006X 6 Cell Matched, Pro Assembled, Side X Side	$134.99

ASSEMBLED RACING PACKS

NT3007 6 Cell VIS EX-TRA Ni-MH Pack $85.00

Standard 6 cell stick racing pack with "Tamiya Style" connector. Excellent pack for all types of modified motors. Extended run time!

*Ranges may vary and will be adjusted if necessary after a large enough quantity of production cells are processed to establish a reliable range of numbers.



"The low end punch and power I experienced with these cells when I tested them in my touring car was amazing. They are definitely the future of R/C", ...Josh Cyrul





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