

R/C Pattern and biplane designs

(ISSN 0015-4849) 47506

SEPTEMBER 1982

\$1.50

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**models**

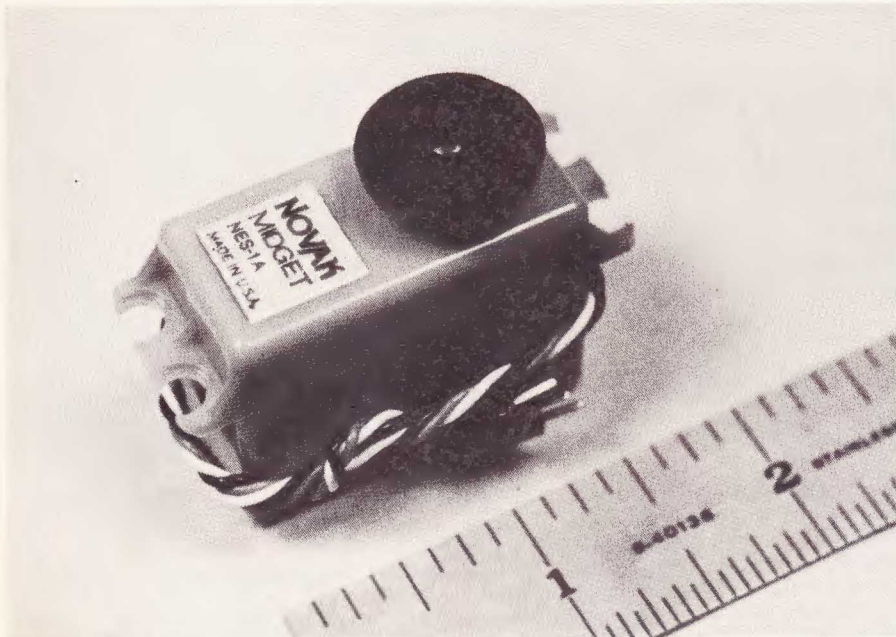


**R/C Boats  
Racing Cars**

**"Bostonian class"  
F/F rubber design**



**G.I. CUB**  
Conversion of Top Flite's kit



PHOTOGRAPHY: BOB ABERLE

The Novak NES-1A is the new, improved replacement for the popular Novak Bantam Midget. The NES-1A will be popular with electric racers because of its good speed, even on a four cell battery pack, and ruggedness.

## An FM Product Review:

# Novak's NES-1A Midget Servo

By Bob Aberle

Speed and accuracy combine in an all new servo designed with the racer in mind.

**N**ovak Electronics has introduced a new servo for the 1982 season. It is called their Novak Midget and replaces the existing Novak Bantam Midget servo which has been so popular over the past couple of years, especially with the R/C car enthusiasts. The reason for dropping the old and introducing a new servo is basically improvement. Bob Novak has designed this new NES-1A servo based on his experiences with the previous unit. The Novak Midget case is a completely new proprietary molding (it is not related to either D. & R. or Dunham).

Let me mention some of the features of this new servo. The gears are molded of type 66 nylon for strength and durability. As you can see in the photos, the case separates into two parts. Both case sections contain an interlocking tongue and groove to achieve a tight seal. Although not part of the basic NES-1A servo, you can obtain an optional

waterproof seal/ball bearing kit for \$6.95. The basic NES-1A servo lists for \$39.95. This price includes your choice of connectors for the following popular R/C systems: ACE (Deans), Airtronics, Futaba, Kraft (standard Multicon), Kraft imported (K-Line), Kraft Sport Series (1.9 M.S. neutral), MRC (Grand Prix) and RS Systems. There are still other connectors available on special order. The basic NES-1A servo comes with an assortment of output arms including: two types of adjustable arms, a wheel output, and a special Ackerman steering arm expressly intended for the R/C car operator. The NES-1A servo measures 1 1/2 inches long  $\times$  1 3/16 inches high  $\times$  3/4 inch thick (less output arm and flanges) and weighs slightly less than 1.0 ounce with cable and connector. Cable length is approximately 9 inches. As a matter of information, the mounting holes are exactly the same as those found on the Bantam Midget, although the new case is slightly larger in both length

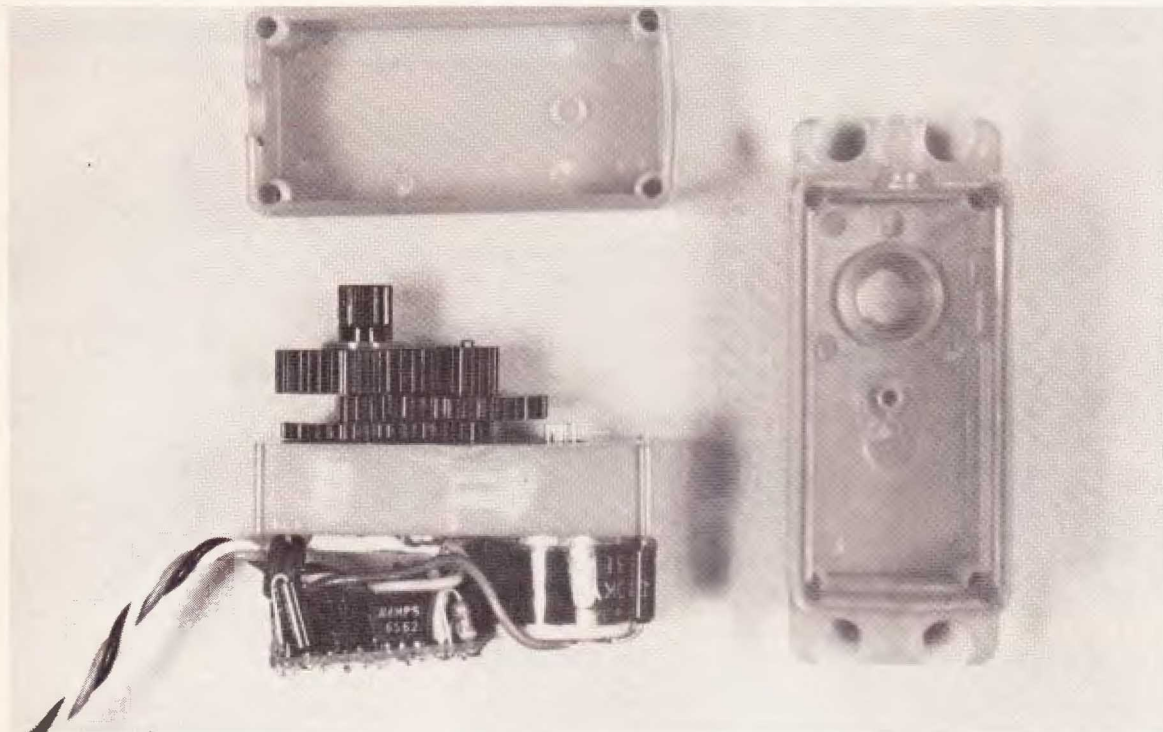
and width. The top of the output shaft has a spline gear which permits adjustment of the neutral position.

Inside the Novak Midget you will find a five pole motor with silver commutator and gold alloy brushes which is 14 MM in diameter, with a resistance of 6.5 ohms. The amplifier contains the popular Signetics NE-544 IC chip with external PNP driver transistors. The feedback pot is of the conductive plastic variety. I measured the idle current at 5 MA. Output torque is claimed to be 21 in.oz. Transit time specification is 0.27 seconds for full 90 degree rotation when operating off a four cell nickel-cadmium battery pack. With a six cell pack the transit time is further reduced to 0.20 seconds.

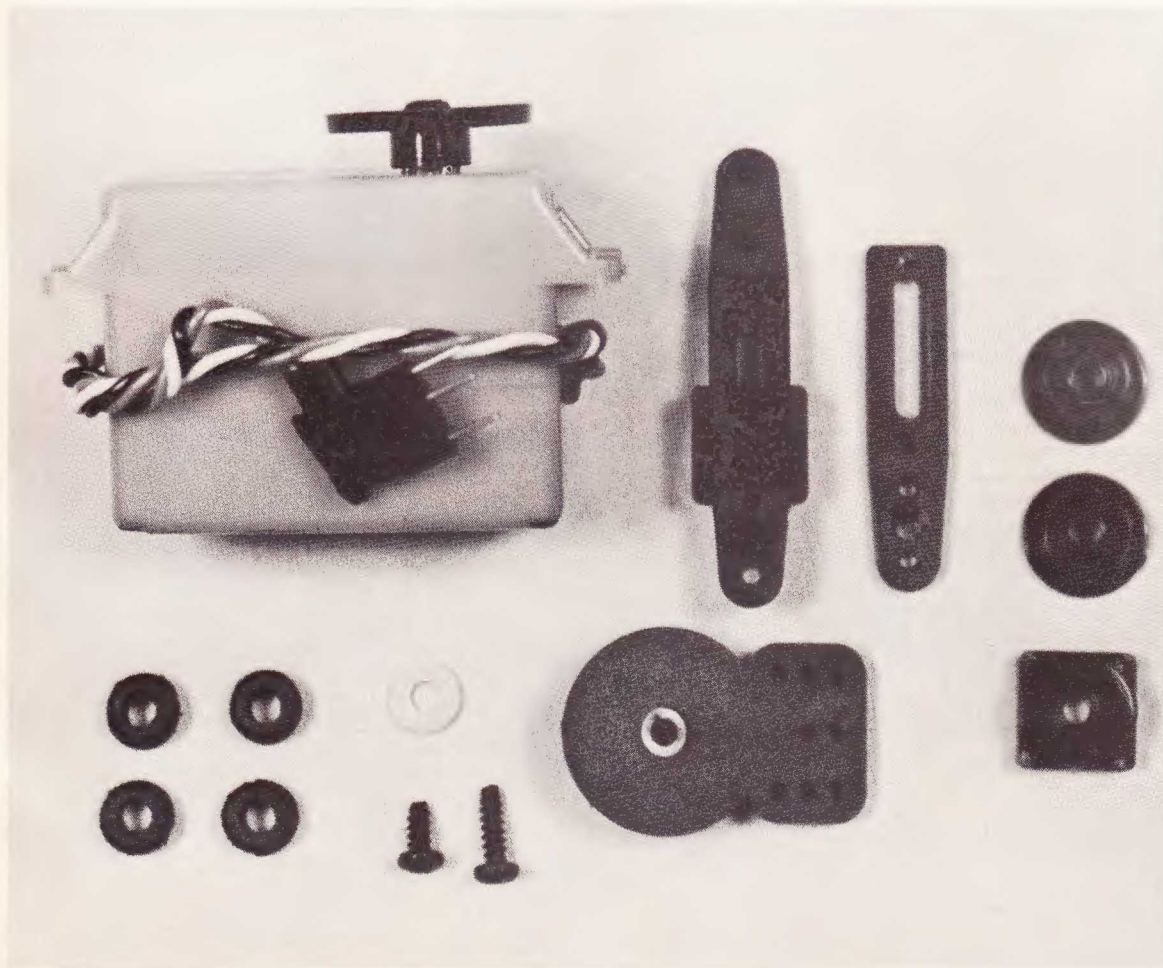
My particular review servo came equipped with a Futaba connector. To conduct an operational check I used a Futaba "G" series transmitter and receiver which was in my possession at the time. Typical servo rotation with this system was 80 degrees ( $\pm$  40 degrees either side of neutral). Neutral return accuracy was something in the order of 1/4 degree when returning from full travel. Under no load conditions the servo did tend to overshoot and then come back to the final neutral position (within 1/4 degree or less). Under normal load conditions I suspect this would not be very noticeable. For sure this servo is *fast!* The mechanical stops in this servo limit total travel (rotation) to 115 degrees. Pulsing the servo in continuous motion, I measured the average servo current (no load) at 300 MA. This is moderate to high current drain and not surprising with such a low resistance motor.

On a comparison basis with the previous Novak Bantam Midget servo, this new servo has the same output; is slightly faster; draws the same current; is roughly the same size and weight; has an optional waterproof seal and ball bearing support of the output shaft (that was not previously available) and is considerably more rugged. For the extra ruggedness you will pay a little more (Novak Bantam Midget was \$34.95 vs. the new NES-1A price of \$39.95). R/C car racers will undoubtedly be thrilled with the performance of this Novak Midget servo. For additional information you may wish to contact Bob Novak. The address is Novak Electronics, 2709-C Orange Ave., Santa Ana, California 92707 (telephone A/C 714-549-3741).

I have one more additional piece of information regarding this particular new servo. The Novak NES-1A servo will also be offered by Kraft Systems Inc. It will be designated as their model KPS-33N servo. In addition, Kraft will also market the popular Novak two channel receiver (naturally in a gold colored case!). The combination of this two channel receiver, along with two KPS-33N servos and a power cord will be identified as the Kraft Carpak, Model KCP-2N, with a list price of \$169.95. Kraft will also offer their Carpak system along with their very popular, K-Line handgrip transmitter (Model KPT3KW) expressly for the R/C car (and boat) enthusiast. This extra marketing concept will obviously extend the popularity of these Novak Electronics components. Keep an eye out for them!



**NES-1A Midget** with case removed (**above**). Rugged gear train will take the abuse of flat track or off-road racing. New servo has same mounting hole alignment as older Bantam model. A number of output wheels and arms are supplied with the Novak Midget (**below**). Arms fit on a spline-type output shaft. Channel mount for adjustable arms is useful for throttle wiper arms. Excellent servo.



# R/C Auto clinic

By Jack Russell

## Outriggers

Some of you may have noticed that the newer Lightning 2000s and the new Associated RC12i have a set of body posts mounted wide on the rear edge of the radio tray. Instead of using the wing tubes as the rear body mounts these cars use a second set of body posts to support the rear of the body. This makes very good sense. The wider the body posts can be set apart, the more stable the body mounting "platform". This is important because there are situations where even a perfectly mounted body will lean in high speed turns. This leaning can allow the body to rub on either the front or rear wheels, which in turn (no pun intended) adversely affects cornering and steering. The extra pair of body posts helps eliminate this unwanted leaning.

Even if you are not driving a Lightning 2000 or RC12i you can take advantage of this body mounting system. I mounted a second pair of body posts on my MRP GP-12 with a minimum of effort. A look at the photo of my car should give a good indication of how these mounts can be added to just about any car. The mounting ears are cut from sheet fiberglass and held to the rear blocks with self-tapping screws. The body posts mount to these ears.

After adding these posts to the GP-12 I have not had any problems with leaning bodies. It's a quick, easy and inexpensive way to build a little more "performance" into a car.

## Painting goodies

I'm always on the lookout for items which can be used to do a better job of painting Lexan bodies. For the last year I have been painting my 1/12 bodies with water base acrylic paints. So far I have used BoLink's "Mr. Concours" and Liquitex Artist's Acrylic paints with outstanding results. Grumbacher also makes acrylic art paints, but I have not had a chance to try them yet. The acrylic paints are a joy to use. Because they are water soluble they clean up easily and can be thinned, with water, to the proper consistency for airbrushing.

Recently I came across yet another water base paint for R/C car bodies. Concept Two, of Huntington Beach, California, has a line of paint on the market which includes a number of "pearl" colors! This is a water soluble paint which smells a lot like latex paint. That's right, latex paint like you probably have on the walls in your living room! I've contacted the folks at Concept Two and hopefully will have more information on their line of paints in a future issue of FM.

Masking bodies is always a difficult and time consuming chore. Masking tape is totally unsuitable because of the sloppy edges it leaves. Some people have used automotive pin striping tape and vinyl shelf paper with some success, but both materials are a little

too thick to adhere well in tightly curved areas.

Lately I've been using Flex Mask tape with outstanding results. Flex Mask is a product of Karoden Hobby Products, P.O. Box 434, Bergenfield, NJ 07621. This tape comes in 1/8 and 3/4 inch widths and is very pliable. It adheres well and will make a small radius curve with no wrinkles. Flex Mask was designed for use with model airplane paints including epoxy and enamels. I've only used it with the acrylic paints previously mentioned, but it is the best tape I've come across. Flex Mask is available from your local hobby shop. Just follow the directions, then stand back and admire some of the sharpest paint edges you've ever seen.

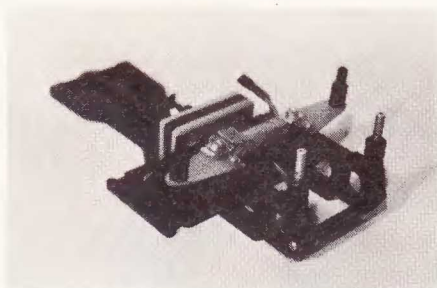
## Sticky philosophy

To glue or not to glue, that is the question. Whether 'tis nobler to spin out and lose or glue and win is a perplexing decision which has faced us since the good old days of slot racing. Now, that same decision has to be made by 1/12 electric racers.

Not only must the decision be made, but another question must be answered: what is glue? Is WD-40 or Teac glue? Not according to the current ROAR definition of tire additives. How about STP or slot car glues such as "Stick It"? If they leave a residue on the track they are technically illegal under ROAR rules. There is always the cotton ball test for treated tires. Jomac's Don McKay came up with this test. Just rub a cotton ball across the surface of a treated tire, if the cotton sticks to the tire the goop on the tire is illegal.

What if the stickum isn't on the tire? What if the traction juice is sprayed on the track? The ROAR rules don't cover that possibility, but it does exist. VHT is a traction compound used on the starting lines at drag strips around the country and it has been used on R/C tracks with the result being vastly improved traction.

In an upcoming issue former ROAR Nats Champ Chris Chan will take a personal look at the tire doping situation. I think you'll find his observations interesting.



PHOTOGRAPHY JACK RUSSELL



Rock and roll is here to stay, but not when it comes to car bodies. Calm your bod with outriggers (above left). All of these potions are ROAR legal tire preparations (above right), but some are reminiscent of slot car tire glues. How far should situation go? Water base paints suitable for airbrushing (below).



## Practice, practice practice

I'm sure a great many of you tire of hearing about how the top drivers do this and that and how if you follow their lead you will improve, too. After a while all this reference to the top drivers must sound like a broken record, but it really isn't. Granted, many of the top drivers possess skill and dexterity many of us will never have, but there is one thing that they do which we can all do in order to improve . . . practice.

Although some of the youngsters who are among the best R/C drivers in the world have a great abundance of natural talent, they still put in a great deal of time practicing. Ralph Burch, Joel Johnson, Mike Lavacot and many other younger drivers spend lots of time practicing. Of course, teenagers have a lot more spare time to practice than does an older person who has to work for a living and has a family to support. Regardless, if you're serious about racing you should set aside some time each week to practice. Just like any other sport, R/C driving requires you to put some effort into it before you can expect to reap the rewards.

Personally, I do not drive well indoors. It takes me a number of races to get into the groove. Part of the reason for my poor performance indoors has to do with not having a place to practice. The lack of a track for practice keeps me from getting much needed time at the wheel. Outdoors, however, I seem to get into shape much faster because it is a simple matter to find a blacktop surface where I can practice.

The benefits of practice are numerous. Practice allows you to build a fund of first-hand personal experience at the wheel. The more time you spend on the track, the more relaxed you will be when it comes time to race. The practical experience gained during practice, like where and when to pass a car and just how far you can push your own car, is invaluable. In this way, practice is an educational tool for learning how to drive.

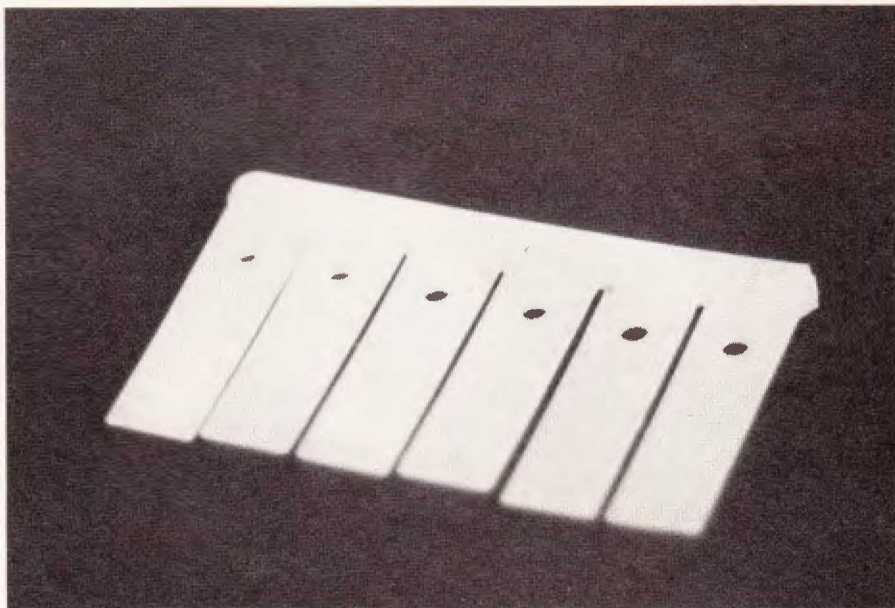
Practice also gives you the opportunity to try new things with your car. The ability to experiment with a car is what most of the experts use practice for. They are constantly trying out new ideas which they hope will give them a slight edge on race day. I personally feel that new ideas and experiments should be reserved for practice sessions, not race day. For most people race day is a harrowing enough experience without having to worry about new, untried changes to a car.

One of the best things about practice is that there is really no pressure during practice. You can go out and try experimenting with your car or learn the track without having race day pressure on you. It's amazing how many things you would never try during a race which can be done at practice without worry. After all, a mistake in practice is just another mistake. A mistake on race day can cost you a spot in the "A" main.

FLYING MODELS



Practicing pays dividends when the green flag drops (above). The more you practice, the better you should go. Sterling Thrust Wedges are perfect for making caster adjustments (below). They're airplane items.



Don't look at practice as drudgery. Learn to use the time to become a better driver who knows more about his car. Many of the qualifiers for August's World Championship in California have been out practicing since January.

### A Sterling Idea

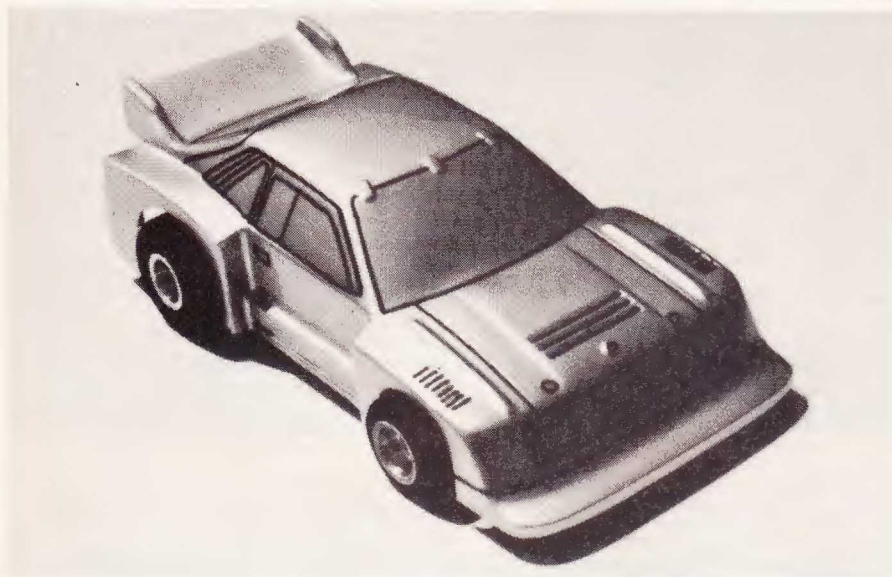
Except for Delta's Phaser, which has provisions for caster adjustment built right in, you don't see many other  $\frac{1}{12}$  cars with the ability to make caster adjustments. There are times, however, when caster adjustments can make a difference. Caster angle will affect straight line stability, cornering and tire selection.

One of the easiest ways to make accurate caster adjustments to a car (other than the Phaser) is to use a readily available model airplane item. Sterling Models, Sterling Bldg., 3620 "G" St., Philadelphia, PA 19134, makes

"Thrust Wedges" for adjustment of the thrust line of model airplane engines. These thrust wedges are perfect for making caster adjustments to  $\frac{1}{12}$  scale cars. The wedges are made of a nylon material and come in 1, 2 and 3 degree angles. The wedges have a hole in them as they come from the manufacturer, all you have to do is drill another hole to match the screws holding your front blocks to the chassis and you have a simple, accurate method of adjusting caster and keeping track of the results.

Depending in which direction you mount the wedges you can add or remove caster angle in relation to the way the car is set up by the factory. These wedges are a whole lot easier to use than a stack of washers and the best part is that they are available at many hobby shops. If your local shop doesn't handle them they should be easily available because they are a Sterling catalog item. ☞

# Pit report



PARMA INTERNATIONAL, INC., 13927 Progress Parkway, North Royalton, OH 44133, introduces the Miller Mustang body in

both 1/24 and 1/32 scale. The 1/24 scale version of the race winning Mustang will fit the new Parma BobCat R/C car.

TWINN-K, INC., P.O. Box 31228, Indianapolis, IN 46321, has a complete line of fuel-proof decals for both 1/8 and 1/12 scale cars. The AJ's Viva Italia mylar sponsor sheets are available for such various cars as Mario Andretti's World Championship Lotus F1 machine, the Parmalat Brabham and the Greenwood Vette. Various sponsors such as Jagermeister and Fruit of the Loom are also available in this series. For more information write to the above address.

TWINN-K, INC., P.O. Box 31228, Indianapolis, IN 46321, manufacturers a complete line of AJ's White Dot tires for 1/8, 1/12 and 1/10 scale R/C cars. A wide selection of compounds is available for the 1/8 and 1/12 road racers. Both front and rear tires are available with compounds ranging from super soft to firm molded in each scale. AJ's also has a full line of replacement tires for Tamiya road racers and the Tamiya Off-Road cars. For more information write to the above address.

NOVAK ELECTRONICS, 2709-C Orange Avenue, Santa Ana, CA 92707, has a new catalog featuring the company's complete line of servos, receivers, battery packs and servo parts. Included in the new catalog is the popular Novak NES-1A servo which is a favorite of 1/12 electric racers. Included with the catalog is a price list. For more information write to the above address.

MODEL RECTIFIER CORPORATION; 2500 Woodbridge Avenue, Edison, NJ 08817, introduces the Tamiya Toyota 4x4 Pickup. This 1/10 scale, electric powered truck has four wheel drive and a servo controlled three speed transmission. Selection of two or four wheel drive and gear shifting is done from the transmitter while the truck is in motion. The three speed gear box comes factory assembled and utilizes a one-way clutch system. The Toyota 4x4 Pickup has a metal frame and comes with all metal parts. The truck is supplied with an RS-540S electric motor. For more information write to the above address.

TRINITY PRODUCTS, P.O. Box 86, Brooklyn, NY 11228, introduces the Trinity Body Clip. Most body clips last a few heats and then bend and loosen so they easily fall from the body post. The Trinity Body Clip is built to last. By using heavier gauge wire, which has been anodized, the Trinity clip is more rugged and stands up to greater abuse. The end of the Trinity clip is bent up to make it easier to insert the clip in the body post hole, while allowing the body to rock on the posts and avoid chassis tweak through a tightly mounted body. Trinity Products Body Clips are priced at 6/99¢. For more information write to the above address.

PARMA INTERNATIONAL, INC., 13927 Progress Parkway, North Royalton, OH 44133. Super Gripper hood pins, #8038A, are thicker, stronger and will stay in place. For more information write to above address. ☐

## A MIGHTY HANDFUL !

### THE NEW 1/24th SCALE PARMA RC BOBCAT

complete kit  
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SEND \$1.00  
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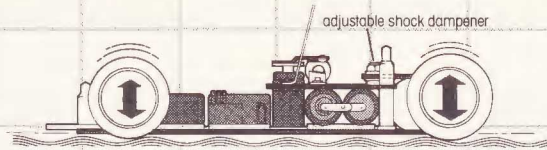
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While the tires of the amazing RC12i follow the contours of the track, the central chassis, radio equipment and batteries remain stable for phenomenal cornering power.

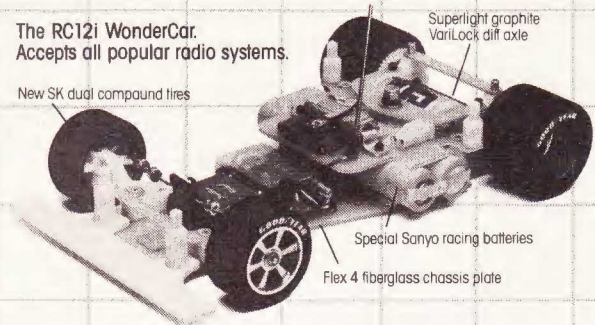
Nobody knows more about building winners than the Team. In just four years our RC12E won an astounding 10 National Championships, winning in every class of competition indoors and out.

Now there's a brand new winner from Associated, the RC12i. We call the RC12i the WonderCar, because it has handling and road hugging characteristics second to none.

The RC12i grips the track with our unique Flex 4 chassis, a totally new design featuring shock-dampened front and rear roll rates and a trailing link controlled beam axle. That gives the RC12i a suspension without springs, to isolate the radio and batteries from excessive vibration for maximum traction on every track surface.

The RC12i WonderCar. Accepts all popular radio systems.

New SK dual compound tires



## FLASH! NEW ASSOCIATED RC12i FLAT OUT-CORNERS THE COMPETITION

And the RC12i isn't all that's new from the Team. Special "SK" dual compound front tires, graphite VariLock diff axles, Reedy Indoor rewinds, plus McRae Can-Am, Brabham F1 and Lola T600 bodies are just a few of our latest speed secrets.

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The IMSA Champion Lola T600 GTP, our newest 1:12 scale body shell. New McRae and Conquest Can-Am bodies also available.



Associated Electrics 1928 East Edinger/Santa Ana, CA 92705/(714) 547-4986

1981 ROAR Nationals! Boston - Mike Lavacot/Team Associated wins Indoor Modified.  
Reedy motors win All modified classes for 4th year in a row.



Rough Rider RA1015



Sand Scorcher RA1016



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Designed to conquer the treacherous Baja, these 1/10 scale racing buggies take punishment and give all out pleasure. No R/C car has ever been so innovatively engineered to give you such complete control and roadability on every terrain.

**ROAD TAMING FEATURES FOUND ONLY IN FULL SIZE RACING BUGGIES . . .** Two forward and reverse speeds propelled by a massive .05 electric motor provide the power. Four adjustable, heavy duty, shock absorbers that are actually filled with oil give you stability for all four semi-pneumatic tires. Each buggy has deep ribbed front tires for stable tracking. The Sand Scorcher boasts special sand tires in the rear, while the Rough Rider uses thick, block pattern rear tires for super traction. A precisely operating independent 4-wheel suspension system smooths the jolts, flattens the bumps. A

lightweight, strong die-cast aluminum front suspension with a double trailing arm assures positive control over any terrain. The ball joints are even connected to the tie rod for simple adjustment. And because you build these brutes from kit form, you'll be able to adjust, fix and modify. You'll know your machine . . . you can conquer the world.

**WE'VE GOT YOU COVERED . . .** On the underside you will find a sealed metal transmission box to keep the mud and elements off the guts. Two special rubber boots protect the steering cage and switch harness, and a waterproof radio/battery box with cam locks keeps your system dry and clean. No one has ever taken such design care with an R/C car before.

It's all here, from the thick reinforced fiberglass main frame to the specially constructed front bumper. The only vehicles that come close to these revolutionary mean machines are the full size buggies. See these at your hobby dealer and get moving off the road.





Changing track conditions can send RC cars scurrying into the pits for a linkage adjustment that could take laps to complete.

The driver with Futaba's 3FG doesn't panic though, because he has Total Control on his side.

A flick of a lever and the adjustable dual rate takes over.



Increase or decrease steering servo throw while maintaining full lock-to-lock control. The 3FG gives you a choice, on the track.

An oversteering, sliding car instantly responds to the pre-set steering ratio and is dialed-in again.

The 3FG system was developed by and for serious racers. In addition to rate control, you'll also find



servo reverse switching, electronic trim, mixing and throttle fine tune in the handsome brushed alloy case.

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Gentlemen, choose your servos.



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