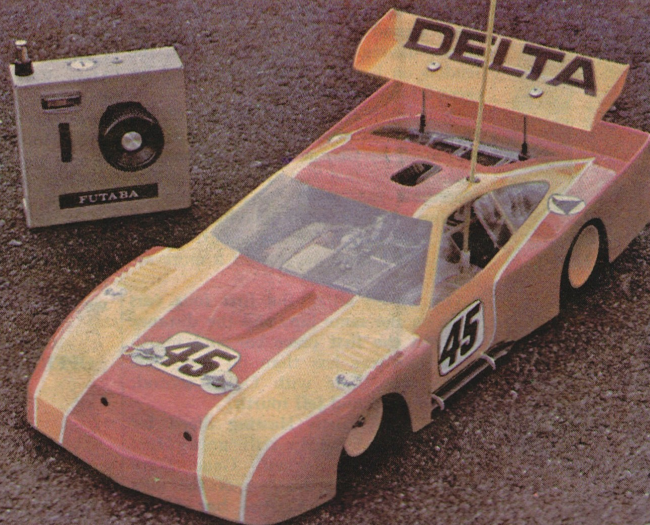
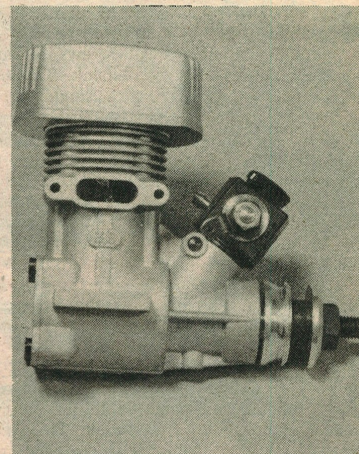


"DELTA SYSTEM"



AN RCW TEST



OPS 21 as it comes out of the box. Note 40 size Perry carb and heat sink supplied as standard equipment.

Jeezzz, I'm letting my personal enthusiasm for this car creep into the text. And we have this reputation for digging into a car looking as much for bad stuff as the good . . .

The Super J kit, surprisingly, is not as complete as most. All kit cars need an engine and radio, of course, but usually are a complete rolling chassis. Not so here, no servo saver of any kind is furnished, there is no tank, body mounting hardware is extra and the brake supplied is the older band brake which operates against the clutch bell. Offsetting this is the fact the Super J kit is priced at \$170.00 where most other 1/8 kits are coming in at around \$200.00 or higher. So it's not like paying for something you're not getting.

Starting at the front, Delta furnishes a white Kydex front bumper which is over-size to allow trimming to suit the body. Next is the front end, the crossbar being 1/2 in. square aluminum. Kingpin inclination is machined into the crossbar and the kingpins are very securely clamped into the crossbar, the kingpins themselves located just inside the edge of each front wheel. The steering blocks are one piece units and appear to be forged. Not a bit of plastic or nylon here, the entire front end is metal and appears to be very durable and maintenance-free.

The chassis pan is also all metal and durable. The fact that it is not 'glass seems strange on such an up-to-date car, but the Campbells (and many others) are questioning the merits of 'glass and have stuck with a metal pan, feeling that it still works best.

Going one up on the other cars, this one features a fully countersunk pan, only the thin engine mounting plate hangs below the pan which allows getting the car very low to the ground.

Running down the center of the pan, from directly behind the servo saver mounting pad to the engine mounting block, is a 3/8 x 11/16 in. nylon stiffener, with the 11/16 in. dimension running vertically. This stiffener is attached to the pan by four screws. As you can imagine, this stiffener makes for a very rigid chassis that does not flex up and down yet will readily twist as can be seen by lifting up on any wheel. That may at first seem contradictory, but remember that with the stiffener the pan is kept flat, no sway-back in the middle. Thus, when asked to flex, as in a turn, the pan doesn't have to try to assume a compound curve to give the desired twist.

At the rear and on both sides of the pan are the side hangers of the power pod. The sealed ball bearings for the rear axle, the sealed outboard clutch/pinion gear bearing, the disc brake unit, the wing tubes, a rearward spacer/stiffener tube (joining the two hangers), are

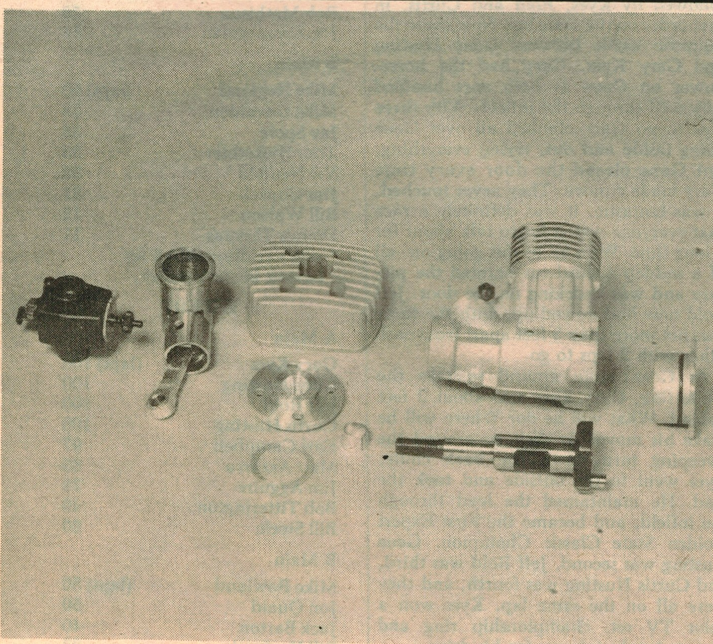
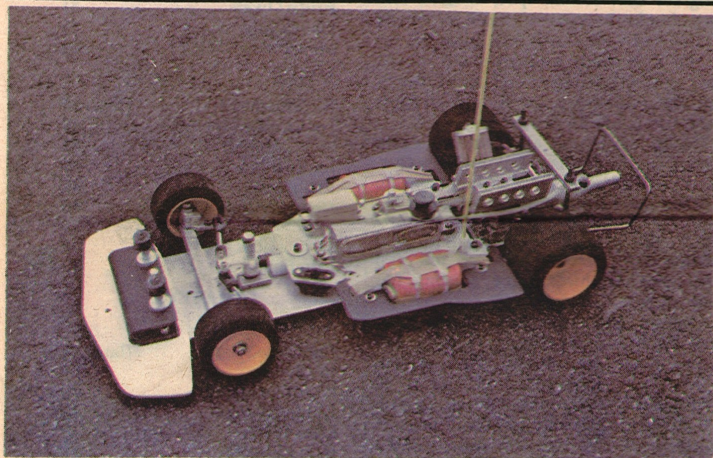
Normally, RCW tests of cars are just that . . . tests of cars. We build the car up from a basic kit, add some extra stuff to make it go, try to destroy the thing and then write about it. But this test is somewhat different in that what Delta has provided us with is not just a car kit, but a car kit *and* a bunch of stuff that they have designed and built for their car. So we're not looking at just a test of another car, this is a test dealing with a complete system, the "Delta System," if you will, meant to build up into a truly complete race car package. One that incorporates the latest tricks. That can be competitive in the hands of not just Arturo Carbonell, but any 1/8 racer that is willing to follow instructions furnished. And a package where each component is designed specifically for the Super J, no compromises made to keep the parts "universal" so they can be used on other cars.

The "Delta System" (our term, not Delta's) results in a car that is designed to win races and to do it with a high degree of reliability. All with bits 'n pieces that the Campbells and Arturo first develop, refine and then offer to you in a bolt-it-on-and-fly package. Small wonder that the guys that run Deltas ask if there really are other brands of cars still made . . . Delta drivers tend to have a feeling of "I'd rather quit racing than to give up driving a Delta." In a recent phone conversation with just such a racer, he flatly referred to other 1/8 cars as nothing more than toys. Now that might be a statement that many could question, and for very good reason, but it does point out the fact that Delta enjoys very solid support from many of the racers they supply with race cars and parts.

Naturally, we are getting ahead of the game here, let's first look at the basic kit of the Super J and what is included.

Delta will probably never set the world on fire when it comes to packaging their kit. Plain brown box with a big DELTA sticker on it . . . initially there is certainly nothing exciting here.

But the contents of that box are exciting, especially to those that like race cars to look like race cars. The beautifully machined parts are removed one at a time and you know right away that this is one car that will go together the way you think all cars should. Nobody could do that kind of machining on a production basis and end up with stuff that doesn't fit.



CENTER: Fully assembled Delta Super J ready for installation of body and on to the '79 racing season. BOTTOM: A look at the internals of the OPS 21 used to power the Super J test car. A very competitive, nicely made engine.

all carried in or attach to these side hangers. Primo machining and excellent fit describe these pieces, plus they do a bunch toward stiffening the rear end of the car, giving a stable platform for the engine and rear axle. Delta cars just don't twist and snake around, even with violent power and this rigid power pod assembly has to be the reason.

Also attached to the forward upper ends of the hangers is the back end of the radio tray, which is made from poly. The forward mount for this piece is a single screw common to the tray and the forward end of the nylon stiffener, giving the desired tripod mounting of the tray.

The tray itself is completely cut out and ready to accept Futaba (or similar) servos, Hi Johnson type tank, receiver and battery packs. Even the switch hole is there.

Back to the rear end, the axle is a huge 3/8 in. in diameter. It is a fairly complex piece for an axle, being threaded on both ends, bored about 1/2 in. deep at both ends (this has to be more of a true machinist's touch than something functional) and drilled through for pins that drive the gear on the right side, the wheel on the left. The glass-filled nylon gears have a slot molded into them that accepts the drive pin inserted through the axle. In turn, each wheel also has this molded-in slot, the right wheel's slot indexing to a male protrusion on the outboard face of the gear. On the left side, the wheel simply indexes to the pin through the axle. Wheels are retained by locking aircraft type nuts, axle end play is shimmed to a minimum with thin washers. In all, a very good method of keeping things in place, totally eliminating set screws and such, while leaving it relatively easy to change rear tires. And it is naturally easy to change gears, but as the Delta gears simply don't get messed up it's a moot point.

Front and rear wheels are of a full-disc design with the rears being webbed on the inboard side, primarily to reinforce the molded drive pin slots, evidently. The wheels are obviously designed more for function than looks. You can tell two ways. First, they are pretty ugly. Secondly, Delta says they are indestructible and they are no doubt prepared to back up that statement. The wheels are also of the maximum dimensions allowed to give as light as possible a tire/wheel combination. Front wheel bearings are nylon bushes, which seem to clash with the zootness of the rest of the chassis.

Speaking of high-zoot stuff, the Delta clutch and flywheel combination is it. The flywheel is a split piece that clamps onto the crankshaft eliminating tapered collets and gives a flywheel that runs absolutely true. The three clutch shoes pivot on pins common to the flywheel and engage a steel (no liner required) clutch bellhousing. No clutch springs are used, the shoes give some slip action and with the pinion gear shaft running in one bearing in the side hanger and another in the flywheel, Delta has engineered a superior method of controlling gear mesh and reducing side loads on the engine crankshaft. Also, clutch maintenance is almost a thing of the past with this type of design. On a 10 point scoring system, we'll give Delta the full 10 for this clutch/flywheel assembly which none other than Roy Moody had a hand in designing.

Steering linkage is supplied and is all fitted with heavy duty ball joints. This type doesn't come off during racing, yet is fairly easy to pull off for adjustment and is free in action. And they look race . . .

Last thing to note is that all screws common to the underside of the chassis are flush head, giving an absolutely smooth surface. And not just any flush

screw is used, Delta went the expensive route with aircraft type hi-torque flush head screws seating in a 100 degree countersink. The heads of these screws have a single slot, but the center is punched in a bit which gives a slot wider at the bottom than at the top. A small point, but it means a lot when it is discovered that this feature makes these screws virtually impossible to strip, if you use the special bit sold by Delta. And that very bit brings up a critical comment. It is just about necessary to have the thing in hand to properly assemble the Super J. Yet it is not included in the kit and that is hard to understand.

Hmmm, almost forgot those big, round black things. Yes, rubber is furnished in the form of cut rings, three per wheel. They are loose and need to be glued to each other before they can be mounted. Compound of the rears doesn't seem to be anything real special, it will work OK on most tracks. Front tire compound is pretty neat, though, giving decent front end bite while still being suited to low-bite tracks, it wears well enough to not be a serious problem and it is light.

THE EXTRA STUFF

Here is where "The Delta System" comes into play. They provide racers that buy their products a bunch of good hardware that bolts right onto the car . . . some of the things are necessary to get the car in racing shape, others are nice touches that may or may not be needed depending on your choice of carb, engine, etc.

The things that we were provided with were many and all were used in building the car. First item on the invoice is the Accessory Package consisting of antenna tubing, air filter (foam with plastic adapter), servo saver, Can-Am wing, wing wires and a full body mount kit. The servo saver certainly needs little introduction to racers, most every manufacturer around has copied it. This package goes for \$26.00.

The Delta Constant Pressure tank comes completely assembled, ready to drop into the radio tray. It is the usual Hi Johnson tank, fitted with Delta's own quick-fill, pressure line, dual fuel pickups (necessary for the double needle valve slide valve carb), an expansion loop in the pressure line and mounting tabs front and rear. What else can you say about a tank that works? For one, you can say that it costs \$20.00 if you don't want to make it yourself.

The special bit for the chassis screws was supplied and it works very well, even if costing \$7.00.

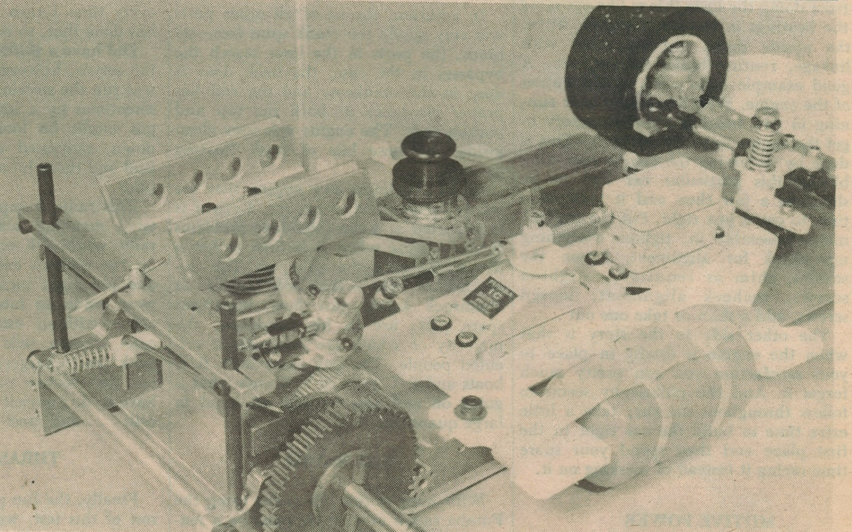
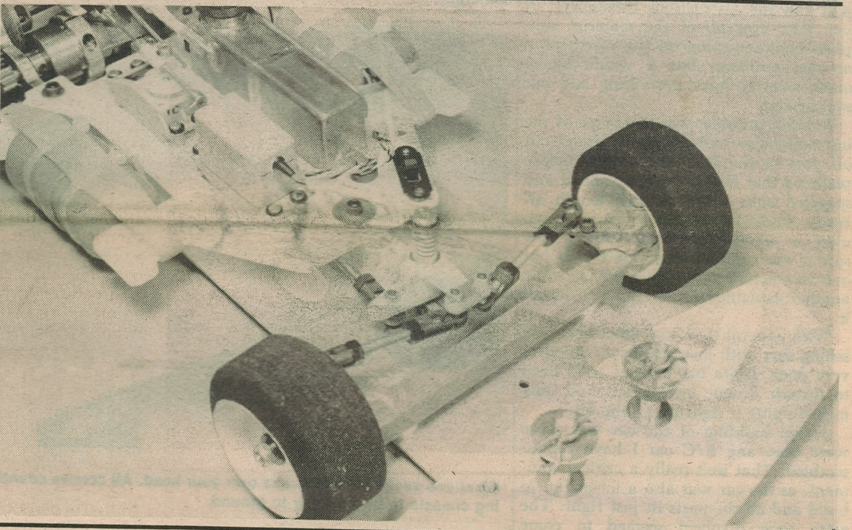
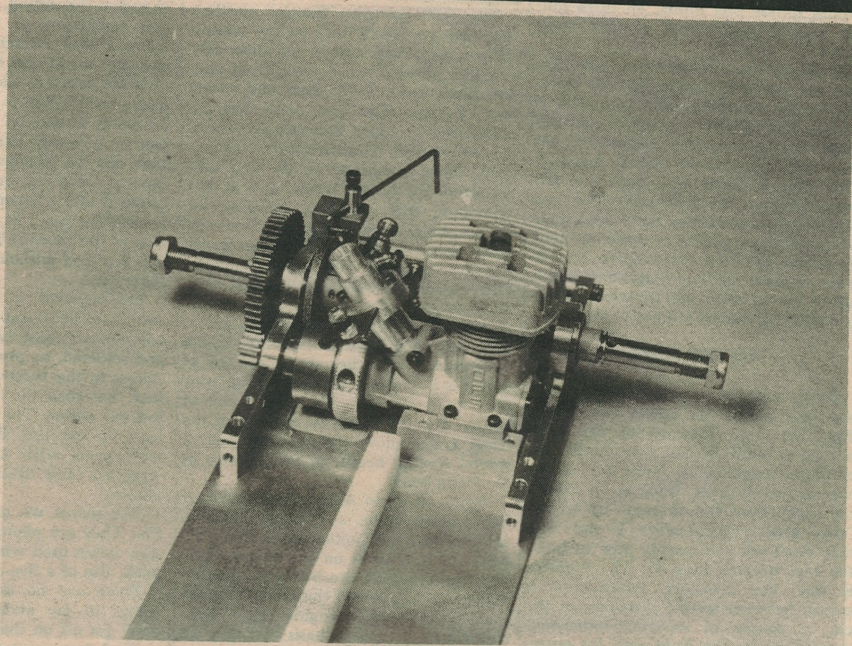
As we used an OPS in this car, it wasn't really necessary to have a Delta head, but it was used anyway. Fits good and cools much better than you would think by just looking at it. The open design makes changing plugs the simple operation it should be, this feature by itself making the head easily worth the \$6.00.

A -80 slide valve carb was installed on the OPS, which did a lot to easing installation of throttle linkage as the Delta car is not set up for anything other than a slide valve. Linkage for a Perry carb can be made up but would be a hassle where the stock linkage is very simple. This nicely made and designed carb sells for \$30.00.

Last of the necessary pieces for today's racing is the Delta disc brake, going for \$30.00. The hub that drives the disc is a clamp-on design that locks securely to the rear axle. The cam support is heavy duty, as is the actuating arm and the brake pads. The aluminum parts are red anodized and the whole thing simply bolts on to the right side hanger.

Thrown in were some little things like silicone fuel tubing, Delta's own sintered

(continued on page 14)



TOP: The noisy end before mounting of radio tray and all of the various pieces attached to it. Part of nylon stiffener can be seen in center of chassis pan. CENTER: Overall view of front end on the Super J. All sanitary and functional. BOTTOM: With rear wheels removed, accessory mounting, throttle and brake linkages are clear. Delta supplied two-piece covers protect right side battery pack.

(continued from page 13)

bronze in-line fuel filters, an extra pinion gear (9 tooth) and a spare main gear.

If you've been counting on your fingers you probably realize that the package we are discussing comes to a total of around \$300.00. But remember that this price buys you a very competitive car that needs only to be bolted together. The tank is done, you need the disc brake anyway, the head is cheaper than others and so on. If you don't need some of the stuff, or prefer to make up your own tank, the price comes down accordingly. I don't see anything here that is out of line in price, add up what it takes to build any decent 1/8 car today.

TO THE SHOP

Delta supplies a set of instructions that can almost be called very good. The first page lists all of the tools needed to build the car, plus another list of things suggested by Delta for use on the car (servo saver, tank, etc.). Where the instructions fail to come up to the "very good" classification is not that they don't tell you exactly how to build the car; because they do. The problem is that the necessary information is spread between several drawings of the car, a couple of separate instruction sheets (one for the front end, for example) and the instructions themselves. If you look over all of the material supplied before starting on the car there is no real problem. But it would be so much nicer to have everything laid out step-by-step.

Another problem was that some of the instructions are out-of-date. I almost cut off part of the front axle shafts before realizing that Delta had gone ahead and supplied bolts of the correct length already. Early versions of the new clutch used a circular retaining spring, the spring was supplied with the clutch but one instruction said don't use it while another explained exactly how to install it.

With several 1/8 manufacturers still selling cars with instructions classified as very poor, Delta has at least tried hard to furnish decent instructions and only missed doing it right by a little bit.

Actual building of the car was more work than any R/C car I have yet assembled. That isn't really a critical comment, as the car was also a lot of fun to build and all the parts fit just right. The extra time involved seemed to come from doing the little things like epoxying the bearings in the side hangers, fitting the upside down steering servo with a linkage, routing brake linkage, etc. A good example here was the installation of the engine. With the pinion gear running in two bearings, it is necessary to get the engine lined up perfectly. This is done by shimming the engine mounting blocks, this particular car had to be shimmed a few thou and it took some time to get it just right. Put the engine/mount assembly in, tighten everything up, check for alignment, loosen the screws, shim as required, retighten screws, recheck alignment, loosen screws, add a shim or take one out . . .

The other side to the story is that when the engine is finally in place to your satisfaction you can pretty much forget it. And this philosophy seems to follow throughout the car; take a little extra time to build the car right in the first place and then spend your spare time racing it instead of working on it.

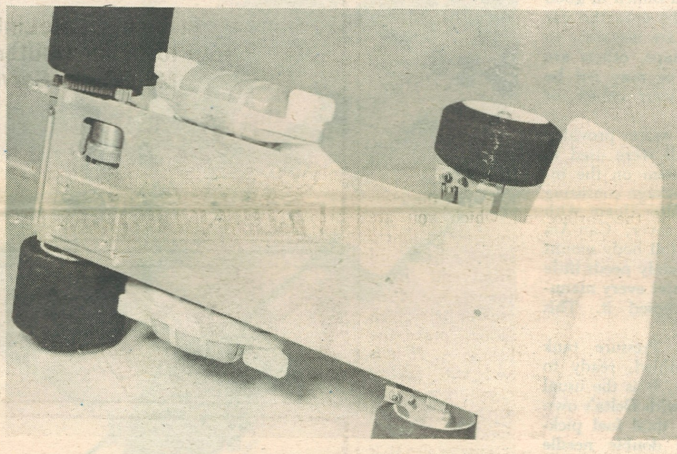
MOTIVE POWER

In the U.S. the OPS 21 does not enjoy the current popularity of the K&B 21, but that situation may change. The OPS is a very good engine with wins at the World Cup and the '78 ROAR Nationals

(Can-Am Expert) among others to its credit.

The OPS features "Snarly" porting, rear facing exhaust stack (when mounted in a car), ABC piston and liner construction, double ball bearing front end, two piece head, Perry carb and strong case castings. The two piece head is neat, a button insert slips into the top of the liner, the combination chamber shape being machined on the one side, the top of the button is flat. A heat sink/clamping ring, designed expressly for car use, bolts down to the top of the cylinder case, clamping the button firmly in place. A couple of advantages here. First, the engine comes with a heat sink, so no need to buy an aftermarket unit. If you are an engine man that likes to play with plug to piston spacing, squish band width, chamber shape and all of that it is a simple thing to make up your own insert on even the most basic of lathes. And the fact that the top of the insert is flat allows easy construction of special cooling heads, or installations of the Delta head.

Proper fit of an ABC piston/sleeve set has proven to be a difficult thing to achieve on a production basis, but OPS has done it. The fit on our engine "felt" just right-out-of-the-box and performance has reinforced this initial impression. Several other engines have been checked on a random basis and they all felt right.



What you see if a Super J runs over your head. All screws countersunk in pan, allowing chassis to be very low to ground.

In addition, the fit of all other parts was very good; the crank spins free—no binds, the ports in the liner match the bypasses in the case, the back door is deep in the crankcase and the rod has proper clearance at both the top and bottom ends. The engine was very clean inside, no loose bits of trash floating around.

In all, an impressive engine that we would recommend to anyone. Even if it is imported and the attendant problems this can cause when it is time to get a desperately needed engine part. The saving feature here is that Bob Murphy at Shamrock knows just how important spare parts are to his customers, the majority of which are competition oriented people. The guy races both R/C boats and R/C cars, so he knows what is going on and keeps spares on hand in large quantities.

THE RADIO

With most of the 1/8 racers using the Futaba radios now, there must be a reason for this radio's dominant position in this portion of the radio market. Turns out there are several reasons. The transmitter has a wheel control for steering and the wheel simply has the right kind of feel to it. Not too much throw from

full-left to full-right, positive centering, a trim device that is not easily bumped, changing the setting, a meter that shows the condition of the batteries, an antenna that retracts all the way into the case, metal case that is easily popped open for access to the changeable crystal and a switch that is guarded to prevent its being turned on accidentally. What can be a handy touch is an extra lead that can be plugged into the receiver battery pack at one end, the other plugged into a receptacle on top of the transmitter case. In this way the condition of the receiver battery pack can be checked and without turning the transmitter on.

The receiver is compact, the case seems to be durable enough and the components must be properly arranged and soldered, as problems here are rare. Access to the receiver crystal is not the best, but then the crystal isn't likely to fall out either. The antenna is way too long for car use, but the radio works well even with the excess antenna wrapped and stuffed anywhere convenient.

The servos we used are the popular S7s. They are plenty strong, but a little slow when used with a four-cell battery pack. Use of a five-cell pack cures that.

There are no doubt a lot of other things to say about the radio, but I don't get off on that electronic wizardry stuff. I just want that sucker to work

When firing the engine for the second run, the first and *only* thing to come loose on this car was discovered. The top on the carb was a bit loose, the screws were removed and reinstalled with loctite. Other than that, the car has been solid as a rock, the extra time spent in building it initially has been more than recovered already and we don't have a full season of racing on the car yet.

That doesn't mean that we are 100% satisfied with the car, however. First thing to get changed was the top to the carb, to a smaller bore unit. Big deal, took two minutes, but slowed the motor down a little, making the car more drivable on this area's average traction tracks.

Delta rear rubber giving higher traction was mounted and works well. Front rubber supplied is generally favored for most tracks, but a set of TRC-318 combination front tires are kept handy if more steering is needed.

First runs showed a touch of tweak in the chassis and this was shimmed out with thin washers placed between the pan and the spacers under the crossbar. An effective method, but not the quickest way to do it. With this in mind an effort was made at installing an MRP tweak plate, but there is just no room for it. Delta would do well to design a combination servo saver mounting pad/tweak plate. If they don't, I'll make my own as these things are the hot tip for getting tweak dialed to the track during those hectic practice sessions.

The clutch has been reliable, but I prefer a lot more slip than it gives. The shoes were lightened the maximum amount and now do slip more, but still not to the degree desired. I guess it comes down to what you prefer, several of the long-time Delta racers I've talked to run the clutch stock and say it is perfect, others cut the shoes but only a little. As I've already cut the shoes as much as possible, I'm trying to develop a little bit of control over how fast and hard I hit the throttle . . .

Good Stuff. That list goes on and on, but let's hit a few of them. The chassis pan is really tough, as is the front end, bumper, wing tubes, wheels, axles, steering linkage, servo saver, disc brake, body mounting posts and wing. The wings supplied by Delta are themselves special, being bent up out of .080 lexan instead of formed over a mold. With the abuse a wing takes in car racing, this heavy duty approach only seems logical.

A big thing that Delta has going for them, especially in light of the '79 ROAR rules allowing smaller diameter rear tires, is the size of the pinion and main gears. Pinion gears are offered in 9, 10 and 11 tooth sizes. This means that main gears don't have to be huge, Delta offers 50, 51 and 52 tooth gears. As the centerline to centerline distance between the main and pinion gears remains constant, it is necessary to change both when regearing, a 9 tooth pinion is used with a 52 tooth main gear, a 51 tooth main matches up to a 10 tooth pinion and so on. The constant, proper gear mesh actually makes going to different gearing easier with the Delta car than with others using shifting engine position to adjust gear mesh, even though on the Delta you must change both the gears.

Anyway, the largest gear Delta makes gives a low 5.77 ratio, yet the gear sits way up high, clearing the top of the chassis pan, let alone the bottom. If you were to run a Delta Super J until the tires wore out and something started to drag, it would be the pan itself . . . and the gear would still be up out of harm's way. There is only one reason to keep spare Delta gears around. If you don't have one, Murphy's law will get you via something really freaky happening.

Gear clearance will be important here

(continued on page 23)

THRASHING IT

Finally, the fun part. And as with the rest of this test, we just have very little to complain about. The motor fired right up, needle settings were close enough, brake action was good, the kit rubber was OK and the tank gave reliable fuel feed, even though it has not one internal baffle.

(RCW TEST continued)

soon. The new rules allow tires down to 2 3/4 in., do you yet realize that a 65 tooth gear is almost exactly 2 3/4 in. in diameter?

Before running the car we had heard that the OPS 21 was like the K&B in that rod breakage can be a problem. So we geared the car low (9/52) and let the engine wind, just to see what would pop. But nothing broke and then we heard that the latest versions of this engine have a beefier rod and stand up to high revs very well. As we tried to break it and it didn't, I guess durability is high. Incidentally, the latest versions of the OPS can be seen to have an aluminum back door, where earlier pieces were of glass-filled nylon or something similar.

Performance of the OPS is outstanding, it just plain runs well at all speeds, idles reliably, will operate on most any

lived engine as the one in the Super J shows no signs of wear at all. The power of the OPS is not quite up to the K&B's but is very close. Close enough that most won't care and remember that in winning Can-Am Expert at the '78 ROAR Nationals Carbonell tried both a K&B and an OPS in his Super J, finally going with the OPS as the car was smoother (read faster) with the OPS.

All things considered, the OPS is a good choice for your next 1/8 motor. It comes with a heatsink and doesn't need trick rods to last, resulting in a less expensive engine that is still top-of-the-line.

WRAP UP

This test has been a lot longer than usual, but like we said at the beginning, it was a test of more than just a race car. Also unusual is that we found less to be critical about, but that is only because the Super J, the accessories to add to it, the Futaba radio and the OPS 21 are all exceptionally good pieces of equipment. You can't go wrong with any of the stuff we have tested here . . . especially that Super J. It is the best 1/8 car tested to date and a very good argument can be made as to it being the best 1/8 car presently available anywhere, at any price. **RCW**