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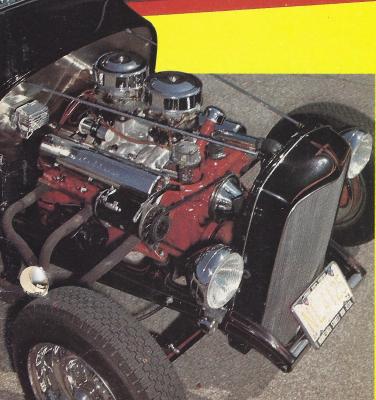


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CORVETTE SPEED SECRETS.



OW MANY out there know about John Greenwood? Hands down. Now, how many follow road racing? If the same readers raised their hands to both questions, that's not surprising. Because John Greenwood is universally known among road racing fans as "Mr. Corvette." But if your motor-sports interests have so far been confined to drags and ovals, if you haven't been out to such courses as Lime Rock, Watkins Glen, Daytona, Sebring, Roat Atlanta, Mid-Ohio, Road America, Laguna Seca, Riverside and others to see the road racers do their stuff, then you're excused for not knowing.

But think back about three years. Remember the B.F. Goodrich full-page ads featuring a beautiful Corvette adorned with a stars-and-sripes paint job and a tall dude with sideburns leaning all over it? Oh yeah, you remember. Well that was John Greenwood and his B.F. Goodrich Lifesaver Radial Corvette.

It's a fact that John Greenwood builds the world's

fastest road racing Corvettes. He also seems to drive them better than anyone else. Chances are you'll be hearing more about the Greenwood machines because he's recently decided to get into the parts business, and he'll sell you anything you want to make your own 'Vette go faster. And though John's specialty is making the car go around corners he has also learned some pretty good tricks for putting all that horsepower on the ground coming out of the turns. That involves such things as anti-lift in the front and anti-squat in the rear suspension — stuff that ought to make you drag racers sit up and take notice, not to mention you street and parking lot racers.

In fact, Greenwood got his start on the streets around Motor City, which used to be the street-racing capitol of the western world. He was building big-motor Chevies and Pontiacs, but turned to Corvettes in 1964 because they were lighter and faster than the larger cars, "For years I was spending \$150 a night, seven nights a week,"

Canadian businessman Rudy Braun is now backing Greenwood's racing effort. This is the 1975 car used to win the Sports Car Club of America's Trans Am series this season. In most respects it is the same as Greenwood's IMSA GT hardtops.



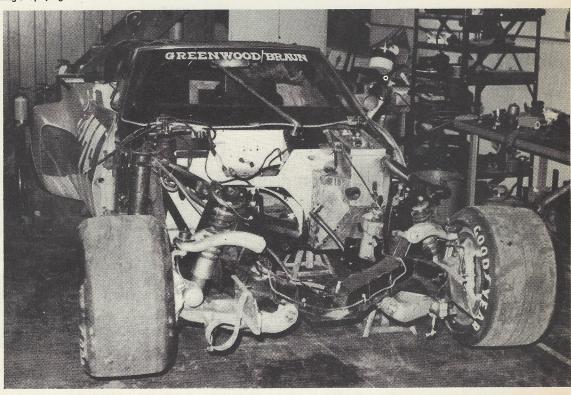
.FOR SALE

BY GARY WITZENBURG

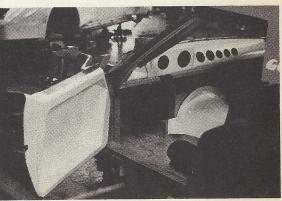
It's taken John Greenwood a decade and over a million dollars to make his Corvettes the world's fastest. Now he's selling the parts he uses to do it

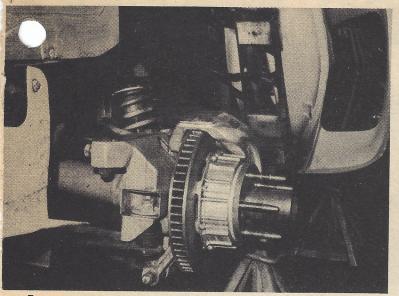


Three generations of GT cars: left is '73 Trans Am car with new nose grafted on, center is new '76 rear-radiator model taking shape, right is '74-'75 IMSA GT car currently being used to test new components under actual race conditions.

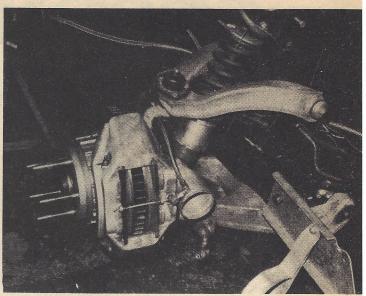


The '74-'75 Batmobile that was used to test new 12-in. Hurst brakes and other components. Doors already have scoops that will funnel air to the new car's rear radiators. Right, inner door panels, dash and transmission tunnel are molded fiberglass to save weight. Door panel is indented to make room for massive tube roll cage bars to be fitted.





Rear suspension has radius arms like a formula car for zero bump-steer. It's so efficient that it does as much braking as front, uses 12-in. discs.



Ultimate in Corvette front suspension. Spring/shock units are aluminum Koni's, brakes have three times cooling area of Chevy units.

he says, "and that was just for gas!"

Then in 1968 he had an L-88 blueprinted Corvette and just happened to drop by a gymkhana and was dared into trying a few laps. (A gymkhana is sort of a road racing course in miniature, marked off with pylons in a large parking lot or unused runway. The cars go one at a time for one lap at a time. The one who turns the quickest lap in his class takes first prize.) Greenwood's first attempt resulted in the fastest time of the day and a new

interest: driving around turns.

He later went to Waterford Hills, near Pontiac, Mich., and watched the amateur road racers go at it. It looked pretty easy from the sidelines. He decided to take his car to the Waterford driver's school, where his instructor took him for a few laps and nearly scared him to death. Greenwood quickly realized that road racing was not as easy as it had first looked and nearly didn't go back the next day. But he did and he slowly learned to drive at competitive speeds around the twisty 1.5-mile course. He ran three races at Waterford that year but did not do well and was so discouraged by the end of the year that he nearly decided to quit. But he thought about it all winter long - how to drive more quickly and smoothly and how to make the car go better in the turns.

The next spring, Greenwood came back to Waterford and broke the track record the first time out. Forming his own engine building company, Auto Research Engineering, he soon became more interested in the design, development and construction of the car and less interested in the driving. "Development was easy for me," he tells us. "I really didn't want to drive the cars."

By mid-season, 1969, there were a pair of Greenwood Camaros running in Sports Car Club of America (SCCA) National races. Greenwood had hired others to drive the cars and they were driving well enough to win races, but, he says, they were going through a lot of engines. He started feeling that his drivers were not taking the proper care with his engines - care that he himself would be taking if he were doing the driving. Then one day he got in one of the cars during a test session and ended up turning a time only one tenth of a second slower than the regular driver - without even trying very hard. Though his driver ended up winning the National Cham-

pionship he was out of a ride at the end of the year because the decision had been made. Greenwood would take over the driving duties himself. It had also been decided to go back to Corvettes.

The next year found Greenwood's ARE team in full force with a major goal in mind - to beat the strong Owens-Corning Fiberglass Corvette team of Tony De-Lorenzo and Jerry Thompson. The O-C duo had racked up an almost incredible record with something like 22 straight wins in Corvettes, including the coveted Nationals Championship. Greenwood and his back-up driver, Jim Greendyke, suffered a lot of problems but finally managed to win the last six races of the year and John emerged the winner over defending champ Thompson at the Atlanta National Championship event. That was five years ago and marked the beginning of the Greenwood reign as King of the Corvettes.

The next step was endurance racing, and the Greenwood car won its class at Daytona with entertainer Dick Smothers co-driving, and at Watkins Glen, plus overall (Continued on page 74)

The Corvette mavin himself, probably thinking of yet another way to make his car go faster.



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VETTE SECRETS

(Continued from page 47)

wins in lesser events at Brainard International and Michigan International Race circuit. Greenwood also found time to accumulate enough SCCA National points to be invited to the year-end championship at Atlanta and walked away with his second straight SCCA title there.

The following year brought a contract with B.F. Goodrich. Goodrich wanted to compete in international endurance racing and was willing to put up a good deal of money to succeed at it, What Greenwood had to do was run on cut-down B.F. Goodrich street radial tires while all the other competitors were on full-race slicks. As it turned out, the two Greenwood cars were quick enough to win the long distance races but suffered a multitude of problems, mostly enginerelated, and rarely finished well.

"If we could have run consistently with no problems," says Greenwood, "we could have won 90 per cent of the races. We had 15-17 full-time people on the program, but the people I had in management just couldn't get the job done." Greenwood admits that he was not able to give the Goodrich program enough personal attention because he was running around most of the time seeing to other business ventures. "That could have been the best thing that ever happened to us, winning a lot of races on street tires," he says "but instead it just went down the tubes."

The association with Goodrich lasted two years, 1972-73, and when it ended John already had a radical new car designed. He decided to complete the car—at a cost of more than \$100,000—and when it was done he felt it would be fast enough to win in International Motorsports Association (IMSA) Camel GT competition. So with no full-time help, he has developed and raced the car off and on for the past two years.

While the "Batmobile" Corvette has certainly been fast, it has not been reliable. It has started from the pole position with the fastest qualifying time nearly everywhere it has raced, but it won only twice in 1974 and failed to finish in five starts this past year. "What we should have done was just go out and test it and record everything we did," said Greenwood, "but whenever we thought we had a good chance of winning, we went racing.' Again, most of the problems were engine-related - electrics, carburetion, or failures of the engine itself. Greenwood claims he has had no chassis failures with his new design - shocks

and springs have sometimes gone bad, but no failures of the trick suspension pieces themselves have occurred.

Part way through the 1975 season, Greenwood decided to either quit racing or do it seriously and in a big way. An enthusiastic backer has now been found in Canadian businessman Rudy Braun and a brand new and even more radical car is in the early stages of development. Pieces for the new car were systematically tested on the old one before their designs were finalized, and a dynomometer test program was run last fall to insure (hopefully) that potential engine problems would be thoroughly ironed out before the season began.

"For this year we have built everything ahead of time," says Greenwood. "We knew in September what we were going to run at the Daytona 24-Hour in February and we started final assembly of the new car at that time."

The new car will also serve as the prototype for the Greenwood customer cars which will be sold in three different stages of assembly. The first stage will be a kit complete with frame, roll cage, firewall, floor pan, body mounts and special suspension pieces. The swoopy fiberglass body panels can be bought from Greenwood or specially ordered through Chevrolet. The second stage includes the full suspension setup - springs, shocks, pedal assemblies, steering column and brakes with plumbing bled and ready to go. The third stage is the complete rolling chassis with everything but the engine. Stage three, says Greenwood, will sell for about \$17,000, but he claims that even with his blueprints and their own shop, noone could duplicate the car for less than \$25,000.

"I give the guys a list of parts," he says, "not our special parts but the stuff I go out and buy off the shelf, and it comes to \$15,000. So essentially, they're getting our special stuff and our labor for next to noth-The reason he can do that and still make a profit is that once a piece is designed and a prototype is fabricated and tested, duplicates are ordered in lots of 20. That spreads the cost for the tooling out over all the pieces and gives Greenwood an inventory for himself and to sell to his customers. The process also saves him money on his own pieces, which is the main reason he has gotten into the business of selling cars and parts to others. "When I was buying pieces for three cars, I was paying two to four times as much per part as I do now," he tells us.

Greenwood adds that a lot of people think they can build a competitive car for less money. They set out thinking they can do it for \$10,000 or \$12,000. They end up spending \$20,000 and by

the end of the season they're so discouraged they want to give up and sell the car. But it's only worth about \$6000-\$8000 on the market with spare engines and everything else. Greenwood says he's sold half-a-dozen complete cars and everyone who has re-sold them has been able to get at least what they paid him, even after a season of racing.

There's no question in Greenwood's mind that there's a market out there for parts, kits and complete cars. "I've gotten about 7,000 letters in the last three years specifically stating parts that they wanted to buy - and I wasn't even in the parts business. Then I started to realize that they're building over 40,000 Corvettes a year and that's a lot of cars." When Greenwood designs a new piece he tries to make it fit as many Corvette models as possible. About 80 per cent of the pieces on the GT cars are identical to those on the A-Production SCCA cars, and almost everthing can be adapted to a street car as well.

This year will be a completely new experience for Greenwood. His association with Rudy Rraun began in 1975 when he sold Braun a Corvette built to A-Production rules to run in the SCCA's semi-pro Trans Am series. Then Braun hired Greenwood to drive the car and the team won three races and the series title. For 1976, Braun will be the owner and team manager and Greenwood will be able to concentrate primarily on the driving. Retired Corvette chief engineer and the famous "father" of America's only sports car, Zora Arkus-Duntov, is a consultant to the team. A considerable amount of engineering talent and fulltime maintenance people will take care of the cars. Braun says they feel confident of being able to beat the German Porsches and BMW's in IMSA's Camel GT pro series and perhaps bring the series championship back to a North American marque. The effort will be called "Old Blue Racing.'

A new rear-radiator car is scheduled to make its first appearance at the November 30 IMSA event at Daytona, but will not be entered in the race. The old car will do the competitive duties while the new one will be on display for the press and the fans and also to psych out the other competitors. There's a chance Greenwood may use it on that occasion to try for a Daytona lap record on the oval of more than 200 mph, and he may go for a 225 mph record lap on the Talladega oval later in the year. But the new car's first road race will be the 24 Hours of Daytona in February.

The 31-year-old Greenwood, who spends some of his time running his non-racing businesses (expanded

metal, tool and die, parts for the automakers and for the aftermarket items such as air cleaners and oil filters), can be expected to devote considerable time to the racing parts and customer-car business now that the hassle of organizing and running the competitive effort has been shouldered by Rudy Braun. The team hopes to become another Roger Penske/Mark Donohue in terms of organization, car preparation and race-winning ability. They just might be able to pull it off.

Greenwood sums it up this way. "I think we've got a good chance now that we have the car sorted to where the tires brakes springs and shocks

aren't going away. It's not using up parts, not tearing itself up. I think the car is working very well. I'm very optimistic." So don't miss the Camel GT series this year if you'd like to see "Old Blue" run.

Actually building your own Corvette race car to compete in SCCA amateur events can be relatively simple, but never inexpensive. You need safety equipment like a roll cage, safety harnesses, a fire extinguishing system and a fuel cell and of course a car to put them into. Making it anywhere near competitive is a more complicated, but still something a good backyard

the tires, brakes, springs and shocks (Continued on page 77) No nonsense pipes. That's what we sell. No chrome. No glitter. No frills. Just high performance exhaust systems that extract max horsepower from your street or track machine. Custom dual exhaust systems are our specialty and custom header bending is available at most locations. After installation, we back up our exhaust systems with the strongest guarantee you can get anywhere. The mufflers, pipes, brackets, even the nuts and bolts, are guaranteed for parts and labor for as long as you own your car. Best of all, you can afford the best—a Superior custom exhaust system. Our quality of workmanship is high but our prices are realistic. Dual exhaust systems • Headers • Custom exhaust work Over 400 dealers from coast to coast. For the location nearest you, check your phone book. Or write. Superior Muffler Centers Inc. Superior 919 Third Avenue Muffler New York, NY 10022

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VETTE SECRETS

(Continued from page 75)

mechanic could accomplish - and many have. That requires special "heavy duty" brakes, springs and shocks and a good, strong, reliable engine prepared to maximize its power under SCCA rules. Then you replace all the rubber bushings with solid ones or, better yet, with the "full floating" type to get rid of compliance in the chassis, and add a good set of sway bars of the proper diameter. The idea is to be able to fine-tune the chassis. Every component should operate through full suspension travel without binding on itself or anything else. Then add a couple of sets of magnesium racing wheels and about a ton of tires and "gut" the car to get it as light as possible. Make sure you have the heavy duty M-22 transmission and a couple of competition rear axles of different ratios, and you're more or less ready to go to driver's school, get a regional license and advance to the National level of competition - if your budget, driving and car maintenance skills can handle it. A good car and a national SCCA license will get you into the semi-pro Trans Am Series, where you might be fairly competitive, or the IMSA Camel GT pro series, where you will not.

The ticket to competitiveness in Camel GT and international-type endurance racing is several hundred thousand dollars and years of development or one of John Greenwood's customer cars. He just happens to have a severe edge because he's spent the time and the money (over \$1,000,000 in three years, he says) to make a Corvette competitive against the exotic Porsche Carreras, BMW CSLs and the others. A duplicate of his own machine, all dressed and ready to go racing but less engine and spare parts, can be had for a mere \$17,000. Still a high-ticket investment, especially once you've bought a couple of competitive engines at \$5,000 or so apiece, but pretty reasonable compared to what it would cost to do it yourself - if you could.

How does a GT Corvette differ from an SCCA racer? The front suspension is about the same, since the rules don't allow any changes in mounting points or the "type" of system (1976 rules will). But it does get "tweaked" a bit and the springs are shortened to get the car about an inch lower than the SCCA car and to get more camber change with suspension travel.

The rear suspension is a different story. The design has been significantly changed except that everything is still mounted at the stock locations.

It has radius arms like a pure racing car, including an upper A-arm, with a toe adjuster and a forward lower link.

"In other words," says Greenwood, "we built a zero bump-steer rear suspension and put anti-dive and antisquat into it, so it basically operates like a formula car and it's fully adjustable." Everything is beefed up of course - the half shafts and the prop shaft, for example, are a third stronger than the biggest ones you can buy from Chevrolet. Brake calipers are heavy-duty magnesium units front and rear, with special pads and ventilated cross-drilled rotors. The springs are progressive-rate and shocks have been Koni racing units in the past, although the latest car will probably use gasfilled shocks. Sway bars may vary, but typically are 1-1/16-in. front and 5/8in. rear. Wheel and tire sizes are free so long as they don't extend beyond the 82.7-in. maximum allowable width. The 1975 car used Sterling Mag wheels of 11X15-in. up front and 15X15-in. at the rear along with enormous racing slicks to fit - but the overall width is kept to 80 in.

Up front, the engine is set back 8-in., down 4-in. and to the right 21/2-in. to improve front/rear weight distribution and to compensate somewhat for the weight of the driver. Aluminum block ZL-1 engines up to 467 cu.in. have been used, while cast iron blocks up to 480 cu.in. are OK by the rules. Most of the internal pieces are Chevroletbuilt, but modified for durability and lightness. Crane or Isky roller rockers are generally used with HD Chevy valve springs and cams by General Kinetics. The retainers are Greenwood's own titanium units. The dry-sump lubrication system holds 20 quarts of oil, the exhaust system uses specially-designed JR collectors and pipes, clutches and flywheels are from Hurst and Schiefer and the distributor is a very trick, hand made, right angle drive unit.

Greenwood says the special cast magnesium, cross-ram intake manifold cost him \$40,000 to build, including development and tooling, but you can have one for a paltry \$3,000 or so. It has a fuel cooler built into the bottom and stainless steel throttle shafts and plates for the Lucas metering injectors. Direct port injection is prohibited but nearly anything else is allowed so long as it fits under the stock hood - and fitting all this under the hood was one reason it became so complicated and expensive. The advantage? About 100 hp, says Greenwood.

He claims to have seen as much as 750 hp from the bigger injected mill, but more conservative estimates place the figure around 680 hp at about 6,800 rpm in endurance racing trim. "Some of the cars we're building now

will get the fuel-injected 350," Green-wood tells us, "because they'll be able to run at 2,600 lb. with that engine under the new rules. Some will have the big-blocks but they'll have to weigh 2,800 lbs." The extra 200-lb. reduction will make a considerable difference in the braking and handling of the car on a twisty road racing course, and the power requirement is less for the same stright-line performance.

Of course, the trick body is the most obvious part of the GT package. It is long and low at the front with intakes for the aluminum radiator and brake coolingducts. From the nose, it widens considerably to accomodate the huge tires and then tapers into the doors. The rear sections start at the doors and are even wider than the front, ending with a small adjustable spoiler across the full width of the tail. Large vents are provided behind both front and rear tires to exit the air from under the body and fenders. The whole thing has a very definite wedge shape, which puts aerodynamic downforce on the tires and helps them with the highspeed cornering and braking chores. This basic body shape was originally designed at Chevrolet Engineering and the special fiberglass pieces were "homologated" to legalize them for competition. At least 150 seats had to be built, and most are still in stock. They can be ordered through Chevrolet or bought directly from Greenwood

The new car for 1976 will have radiators mounted in the rear to further improve weight distribution and take the large opening out of the front of the car. "Just in aerodynamics alone that's worth 10 mph," Greenwood says. The big coolers will be in a horizontal position behind the 31.4 gallon fuel cell. Adds Greenwood, "We've put some pretty good-size openings into the doors, and the air will pass up over the inner fenders and will be ducted into the radiators. We'll have some fans back there too. We've got some testing to do yet to make sure we'll get enough air back there and that it can exit properly in back."

Other changes to the new car include more "set-back" for the engine, probably more than a foot total, to get even more weight concentration off of the front and onto the rear wheels and new 12" Hurst brakes front and rear with three times as much cooling area on the rotors as the previous units. There will also be more weight-savings from increased use of fiberglass in such places as the dash and transmission tunnel and aluminum oil tanks front and rear that can be switched around to alter the weight distribution for changing track conditions.

"Bob Riley (designer of A.J. Foyt's

and many other successful race cars) did the original design job on the rear suspension," says Greenwood, "and after two years of test and development work, we're essentially right back to the original setup. The front suspension geometry is fine the way it comes from the factory, but our rear design eliminates the deficiencies of the street Corvette - front end lift, rear squat and trailing throttle oversteer." So save your pennies, Corvette Freaks, and maybe you too can someday have the fastest, best handling and hairiest looking Vette in town. Everything's in the Greenwood parts bin in his Troy, Mich., shop - all it takes is the bucks.

INDY RACE

(Continued from page 58)

drove around.

Nearly three quarters of the first round winners were in the eights. Wayne Gapp advanced with an 8.80 in the first round while Glidden beat Landy with an 8.97. Booth Beat Gauthier at 8.83, Zul beat Charkie Reed with an 8.97, Nicholson advanced Jerry Haus, on his 8.94 and Jenkins beat Mills with an 8.92.

Going into the second round, Glidden ran an 8.96 to dump Floyd Williams, Gapp's Taxi continued the

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