When Tex Johnson flashed across the finish line to win the 1946 Thompson Trophy race in Cobra II, the era of the homebuilt unlimited air racer came to a sudden and resounding end. Surplus World War II fighter planes, stripped of their military hardware and with their powerful Merlins, Allisons and Pratt & Whitney's boosted to the breaking point, were simply too much for the little shoestring operations that ruled the roost in the 30s with their backyard creations. Over the succeeding years at Cleveland and more recently at Reno, the highly modified Airacobras, Corsairs, Bearcats and Mustangs swept the postwar unlimited races... and the Mystery Ships, Laird Solutions, Gee Bees, Wedell-Williams, Folkerts, Mr. Mulligans and Laird Turners slowly faded into legend.

Oh, there were dreamers, of course... those fellows who loved to lounge around the airport cafes, bars and shops regaling all who would listen with their dreams of jacking up a Merlin and building the lightest, smallest airframe behind it that a pilot could sit in... then, boy, would those Mustang drivers be in for some rude shocks!

But all of them weren't simply dreamers. Some highly competent aeronautical engineers took the time to crunch enough numbers to come to the conclusion that... indeed, the modified fighters could be beaten. There was, they discovered, a narrow band between the onset of compressibility and the speeds the most powerful reciprocating engine could generate in a large warbird airframe... a little slice of the subsonic performance spectrum a sufficiently clever aerodynamicist supplied with sufficient money might squeeze into.

They had discovered a new mountain... and as we all know, mountains are there to be climbed.

As you are reading this, several teams are working furiously to complete “homebuilt” racers in time for this year's Reno Air Races... and if they are successful, another era will have ended. The war surplus air racer will be dead and gone... forever.

In February, SPORT AVIATION had the opportunity to visit one of the teams and interview the designer of its new racer.

In the mid-60s a team of uniquely talented men came together to create the modified Bearcat that Darryl Greenamyer would use to thoroughly dominate unlimited class air racing from 1965 to 1971... and set a new world speed record for propeller driven airplanes in 1969. It consisted of Bruce Boland, a Lockheed aeronautical engineer who specializes in conceptual design, aerodynamics and structures; Pete Law, another Lockheed engineer and the team's answer man when the time comes to figure out how to cool an engine operating far in excess of what was ever intended; Ray Poe, now retired from Lockheed and a wizard when it comes to systems—electric, hydraulic or whatever; and Phil Greenberg, the master of metals who takes all the ideas, plans and schemes and translates them into beautifully crafted structures a pilot can take out to do battle with the physical laws of the universe.

The team would later be similarly involved with the development of Greenamyer's F-104, Miss Candace/Jeannie, the Red
Baron and last year's Reno winner, Dago Red — just to list a few of their more successful efforts.

In the early 70s, Bruce and industrialist/air racer John Sandberg began talking about a homebuilt unlimited, kicking around every conceivable configuration, engine, type of construction, etc. — and the amount of power required to be competitive. Bruce ran some numbers and determined that given the Reno lap times of the early 70s, they would be able to show their tailfeathers to existing racers with only 1500 or so horsepower. This, of course, in the very small, lightweight airframe they had in mind.

Throughout the 70s, however, Reno speeds kept climbing, so that every time Bruce and John got together — usually during the September races — they had to revise their power requirement upward. Among his various enterprises, Sandberg owns an aircraft engine overhaul shop, JRS Enterprises, and being a Kingcobra owner, is partial to Allisons. Initially, this was their engine choice, but when the power requirement crept up over 2000 horsepower, they switched to the Rolls Royce Merlin.

Finally, in 1979 during the trials in which the Red Baron set the current world's (prop) speed record of 499 mph, John gave Bruce the go-ahead. Design and build the airframe he said, and I'll build and test the Merlin. As project engineer and manager, Bruce's first move was to get on the phone and pull together his team of Law, Poe and Greenberg.

The next item of business was to name the airplane. The team particularly savors names and has a lot of fun dreaming up hard to pronounce monikers that often have several possible connotations. One evening, Bruce, his wife, Dorelle, and Phil were in a bar bouncing all sorts of names off each other . . . but none seemed to fit their slightly weird criteria. Finally, Dorelle recalled something she had heard Dr. George use the night before. Dr. George is a LA TV personality, a far out weatherman with a penchant for disasters of all types: floods, hurricanes, shipwrecks — anything high on the stupendous scale. His most recent show had been on tidal waves and he had made a big deal out of the Japanese term for the phenomenon — which is tsunami.

"Tsunami" — that was it! It represented an awesome force in nature, would be pronounced a hundred different ways — all but one hilariously incorrect — and certainly was different from the usual "Miss this or that", "Spirit of whatever", etc., that Bruce, particularly, hates. Already they have been rolling in the aisles at hearing it pronounced "salami", "toots-U-name-eye" and worse.

Bruce and Dorelle Boland.

PROFILE . . .

BRUCE BOLAND

By Jack Cox

As the Project or Consulting Engineer on racers that have taken 17 first place trophies and set two world speed records, Bruce Boland has earned a special niche in the annals of air racing history. Having been actively involved in unlimited air racing for the past 19 years means his participation stretches over a period longer than the total existence of the old National Air Races at Cleveland and Los Angeles, including the post-war events. You have to hear the litany of his credits to really comprehend his participation to the sport, however. Try these on for size:

- Darryl Greenamyer's Bearcat — redesign and construction of a new vertical tail, design of wing fillets, new exhaust stacks and fairings, propeller/engine performance, weight and balance, gear door vents, flight test program.
- Red Baron RB-51 — Project engineer, in charge of all engine/propeller performance, stability and structural analysis. Redesign of engine mount, vertical tail; design of new canopy, windshield, fuselage bathtub fittings, supercharger gears, new cowling, exhaust stacks, carb duct and elbow, ventral fin, wing fillets, fuselage beef-up, prop optimization, weight and balance and flight test program.
- Mike Can-oil's Cobra II
- Sherman Cooper/Mike Carroll Sea Fury
- Mike Carroll's Cobra II
- Planes of Fame's F4U-1 "Budweiser Light" powered with a P&W R-4360.
- Planes of Fame's F4U-1 "Budweiser Light" powered with a P&W R-4360.
- And quite a number of other non-racer warbirds . . .
(I hate to spoil their fun, but the correct pronunciation is "SUE-NOM-EE").

Anyway, with financial backing and a tricky name, it was time to get to work. Bruce is the one who conceives airframe configurations and designs structures, so it all had to begin at his drawing board. He freely admits that he draws heavily from the past to get to work. Bruce is the one who conceives airframe configurations and designs structures, so it all had to begin at his drawing board. He freely admits that he draws heavily from the past to get to work.

Bruce and his wife, Dorelle, live in Tujunga, CA, one of the zillion municipalities that make up Greater Los Angeles. For all his accomplishments, Bruce has never been in aviation's spotlight — mainly because he is a team oriented person. During my interview with him, he always spoke in terms of "we" rather than "I." John Sandberg, Pete Law, Phil Greenberg and Ray Poe — and even Greg Benson who had just joined the group to help complete the racer on schedule — were always mentioned when past and present accomplishments were being enumerated. "It's a team effort," was perhaps the most recurrent phrase in our conversation.

An EAAer since the late 60s, Bruce Boland is certainly a fellow member all of us can be proud of. We wish he, John Sandberg and the entire Tsunami team success in the months ahead. It would be great to see the recip world's speed record set by a "homebuilt", wouldn't it?

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the event of a blown engine and the seemingly inevitable oil spray that obscures the pilot’s vision.

The coolant and oil radiators will be located up inside the fuselage, behind the pilot. An air inlet similar to that of a Mustang, but much smaller, is mounted in the belly. The cooling air outlets are just in front of the small ventral fin you see in the drawings. Interestingly, the vertical fin doubles as the oil tank . . . helping with CG considerations, Bruce says, as well as providing the more obvious surface cooling effect. The dual purpose radiator (one section for oil, the other for engine coolant) is being custom built . . . at considerable expense.

Tsunami’s tailwheel unit is from a P-51H. It weighs only about 22 pounds and is physically small enough to fit in the racer. As can be seen in the photographs, the all-metal construction of Tsunami is quite conventional . . . in fact, there is nothing unconventional about the airplane. Its moment arms, indeed the overall geometry, have been carefully tailored to produce what for a racer is a nice flying airplane. Bruce is of the opinion that even the most skilled pilot cannot wring out the maximum speed potential of an airplane if he is having to fight it every mile of the way . . . especially in pylon racing.

“If it handles well, it will go fast,” is Bruce’s succinct opinion on the matter.

The projected stall speed is around 85 mph and the touch down speed on landing will be about 105. Split flaps for drag only (and to lower the nose on approach) will be fitted.

As stated earlier, I had the opportunity to visit the project in mid-February (in the company of Ken Brock). The airframe was being built in Phil Greenberg’s shop in Chatsworth, CA — near the Van Nuys Airport. The wing will be one piece when completed, but has been built in 3 sections. The outer panels were essentially complete when we arrived and the center section was in the jig. A mock-up of the engine compartment had been built to fit the shortened mount and build the cowling. The “liquid bay”, or center portion of the fuselage was in its jig and was being precisely

aligned by means of a laser. Bruce told me that the tail feathers were being built in his garage and were well along at the time. The remaining major part of the airframe, the aft fuselage, was in a stack on a work bench — all the parts had been made and were in the process of being deburred and cleaned up before being put in a jig for assembly.

According to Bruce, the schedule his crew was following called for completion of the airframe and transport to the Chino, CA airport by the end of May. There, in the shop of Ed Maloney’s
Mock-up of the power section. Note the Mustang spinner and shortened Mustang engine mount. The frontal area of Tsunami’s fuselage will be 9.8 sq. ft., compared to 12.6 for a Mustang. The engine shown here is simply a clunker being used to check for fit of various components.

Planes of Fame Museum, Tsunami will be assembled and the engine and systems installed. The in-joke among team members is that the electrical system will consist of the wire and the hydraulic system of the line...their way of expressing the utter simplicity of the machine. It was a matter of interest to me that, even with its 500+ mph speeds, Tsunami will stick with manually actuated control surfaces — muscle driven pushrods and torque tubes. No hydraulic boost is planned, although servo tabs will be employed, of course.

The initial test flight should occur sometime in June, so that a couple of months of flight testing can be accomplished before the Reno races in mid-September. Skip Holm and Tom Morgendorf, both test pilots for Lockheed, were set to do the early flight evaluations, but a race pilot for Reno had not been selected at the time of my visit.

After Reno, the airplane will be prepared to assault the world’s absolute speed record for piston engine airplanes. The pilot will be the owner, John Sandberg. John has never felt a personal need for more than a Private pilot’s license, so it is for him a matter

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of special, personal pride that the record be broken by a Private pilot. (Go for it, John!)

THEN ... to answer your questions as to the reason for the accompanying drawing of the Tsunami on floats, yes, the team hopes to break the absolute world's speed record for seaplanes. The mark is 440.681 mph, set in 1934 by Italian Francesco Agello in the Macchi-Castoldi MC-72.

"We feel the Italians have held that record long enough," Bruce says with a little twinkle in his eyes.

For that attempt, the Tsunami's landing gear will be removed and its hard points will be utilized to attach the float struts. Bruce has already made a study of float design and, not surprisingly, has found those of the old Schneider Trophy racers to be very hard to improve upon. One edge may be the fact that the record will likely be attempted off the Great Salt Lake, so the unusually dense water there will permit somewhat smaller floats. In the early stages of the project, it was hoped the seaplane attempt could be made in 1984, the 50th anniversary of the Italian record, but this may not be possible. The landplane record has first priority after Reno so it may well be into 1985 before the seaplane configuration can be developed.

Several things should be stressed at this point, the first of which is the fact that although Tsunami is being privately financed and is being constructed by a small team of designer/builders, it is by no stretch of the imagination an "amateur" effort. The Boland/Law/Poe/Greenberg team is perhaps the most experienced in the racing business ... and engines ARE John Sandberg's business. The airframe design is backed up with computer analyses, the printouts for which would fill a Sears catalog sized notebook. All-in-all, it is undoubtedly one of the most sophisticated efforts ever directed toward a racing aircraft ... although the airplane, itself, is a very simple machine.

And, then, Tsunami is unique among racers in that a life after racing is planned for it. Ultimately, it will become a research aircraft, likely refitted with a turboprop engine so it can be used for near supersonic propeller testing.

All that's in the future, however. For now there's simply the excitement and anticipation of a truly competitive "homebuilt" unlimited air racer for the first time in 44 years. Can it really beat the modified Mustangs, the R-4360 powered Corsairs and Sea Furies?

Reno is going to be VERY interesting this year!