

IN THE AUGUST 1975 issue of *SPORT AVIATION* well-known designer/engineer David B. Thurston (EAA 34906) introduced a new amphibian, his TA16 Trojan. An all-metal, 4-place, T-tailed machine larger than the typical homebuilt by a rather significant degree, it was not expected to attract a vast horde of eager builders, but would put a lot of air/water capability into the hands of those able and willing to build one.

Then in the September 1977 issue, David made a progress report in which he announced that a Florida corporation had contracted to certify and produce the Trojan, so homebuilt plans sales had been ended with Hull No. 33 - 32 builders in all since no Number 13 had been issued. (Later, this was increased to over 50.) Pictures of the most advanced project at the time, Hull No. 10 being built by Billy Johnson of Leland, NC, were included with the article.

A lot has transpired in the intervening years. The proposed manufacturer fell by the wayside and another has taken its place . . . and is at this time in the process of certifying the airplane as the TA16 Seafire. Designer Thurston and builder Johnson have also hung in there and, at last, a homebuilt Trojan has taken wing. Hull No. 10 - N1378J on the FAA's registration list - flew for the first time on May 20, 1983, but its public debut came in March at Sun 'N Fun '84. The prototype Seafire flew on December 10, 1982 and improvements made as a result of test flight findings have subsequently been incorporated into the homebuilt Trojans.

Billy's airplane was a big hit at Sun 'N Fun and was awarded the Best Original Design trophy on awards night.

David Thurston mailed out the first batch of drawings in November of 1975 and Billy set to work immediately. Over the years, Dave stayed just ahead of him so that no delays were ever experienced waiting for plans. Billy is a machinist for DuPont in a plant in Wilmington, North Carolina and he normally works a four day week. With a lot of time to work on the airplane, he established a work schedule averaging between 20 to 30 hours a week that he adhered to religiously for the next 7½ years.

The fuselage - or hull - was built first. Thurston designed it to be built upside down on a big table for ease of access and alignment of the hull frames. After completion of the hull, it was moved outside . . . **and remained there for the duration of the**

project. If you are not familiar with the climate of coastal North Carolina - the southeastern coastal area - winters are quite mild, with perhaps just a month or so when it is too cold to work in an unheated shop.

In 1978 and 1979, Billy trailered his hull to Sun 'N Fun for display and for Dave Thurston to have on hand for his builder's forums.

The tail feathers were built next and were hung up in the shop after completion to provide room to build the wings. After all the major components were made, the airframe was assembled **outside** in Billy's yard and remained there for the next 3 years as the amphibian was completed. The entire airframe had been carefully corrosion proofed, so the outside exposure produced no ill effects.

At Sun 'N Fun Billy had a number of interesting observations to make on the project. First, he was very much impressed with David Thurston's construction drawings.

"I am a machinist by trade and I have dealt with engineering drawings all my life. Errors are an everyday thing in most of them, but not with Dave's plans," he says. "There were very few in his drawings - very few. I think he did a great job."

When you see it out on the flightline as we did at Sun 'N Fun, the Trojan is a big and imposing airplane. It is downright intimidating when you begin viewing it as a homebuilt project. Just how complex and time consuming was it, I asked Billy.

"I was amazed at how easily I was able to do the things I imagined to be the most difficult in the beginning . . . and how time consuming some of the apparently simple things turned out to be. The landing gear, for example, **looked** difficult, but it just involved making a lot of individual parts and then one day you simply put them all together and you had a finished gear. The drawings for each part were **very** detailed.

"The thing I enjoyed least was the canopy. It wasn't difficult as much as it was . . . well, hard to handle. You just had too many large, floppy parts to hold and clamp while you put it all together. (This is probably the most common complaint in all of homebuilding - fabricating canopies is **no one's** favorite task - Ed.) The airplane is certainly larger and probably takes more hours to build than most other homebuilts, but I don't believe it to be beyond the ability of a good amateur builder - a good craftsman."

A few fiberglass parts - the nose cone, bow deck, nose bowl on the engine pod, turtle deck and rudder tip fairing - are available commercially,



By Jack Cox
Photos by Golda Cox

but, otherwise, Billy built everything himself. (According to David Thurston, he "even constructed heavy duty rollers to properly contour the spar capstrips, formed from ¼ inch thick 2014-T6 aluminum alloy extruded 90° angle stock over 12 feet long.") He also did a major overhaul and balance job on his 250 hp Lycoming O-540-A4D5. He had built up auto engines before, but this was his first aircraft engine overhaul. "I don't claim to be all that good, but the first time I tried to start it, it fired off after the first blade. It's been flying for almost a year now and there are absolutely no leaks - not even any damp areas - so, I must have done something right. The engine has never missed a beat since I started running it."

The Lycoming drives a freshly overhauled 80 inch Hartzell constant speed propeller and, as you can see in



BILLY JOHNSON'S TROJAN

the accompanying pictures, is tightly cowled in a pylon-mounted pod. It is a tractor rather than the pusher configuration that has been more common on similar amphibians in years past.

Two jobs Billy didn't do in their entirety were the upholstery and the spray painting. His wife, Jane, was instrumental in designing and fabricating the cabin upholstery, and after accomplishing the necessary surface preparation, he turned the spraying of the Pratt and Lambert polyurethane finish coats over to a professional painter.

When finally ready for its initial test flight, Billy's Trojan was a faithful "original" off Dave Thurston's plans. About the only visible alteration was its 6:00x6 nose gear tire. Thurston had initially prescribed a 5:00x5 nose gear tire, but when most builders asked for a larger 6:00x6, he

acquiesced and made provision for it in the drawings. The nose wheel does not fully retract - it leaves a portion of the tire exposed to act as a bumper for docking operations. The larger tire simply makes a better bumper.

May 20, 1983 was a big day for Billy Johnson. He had already decided to do the test flight personally and had himself and the airplane primed and ready to go. With a new chrome major, he knew he could not do a lot of ground running for fear of ruining the Lyc, so after only about 5 minutes of taxi work to check the brakes, steering, nose wheel shimmy, etc., he pulled out on the runway and poured on the power. His intention was to accelerate slowly up to about 40 mph, then feed in full power. By the time he had half throttle in, however, he was already roaring through 80 . . . "So, I just firewalled it and flew." He climbed out to 4,500 feet,

flew around for a half hour or so, stalled it a few times and finding no glitches of any type, brought it back in for a landing.

Like most aircraft designs, the Trojan has taken on additional weight - empty and gross - in its transition from the drawing board to the sky. Flight tests on the Seafire prototype resulted in some additional beefing up and mass balancing of the tail to keep the now heavier airplane out of the flutter mode. Making these modifications caused Billy to miss Oshkosh last summer, so that Sun 'N Fun '84 was his first opportunity to show off the Trojan.

N1378J tips the scales at 2,050 pounds empty and is limited to a gross weight of 3200 pounds. It stalls at a modest 60 mph clean and at a very low 50 with full flaps (20°). Billy flies his approaches at 80 indicated with full flaps and says it "handles like a



Billy Johnson

dream" at that speed. At 3,000 feet, the Trojan cruises at 145 mph indicated . . . and 135 at 8,500 feet. At full throttle, 27 inches and 2700 rpm, it tops out at 180 mph at 2,000 feet.

Billy is extremely pleased with the Trojan and expects to have it at Oshkosh this summer. Just look for the tallest T-tail on the homebuilt line.

Billy Johnson (EAA 84812) lives at Rt. 3, Box 248, Leland, NC 28451. He's a lifelong resident of the Wilmington area and began flying there in 1971. He soloed in a Cherokee 140 and went on to get a Commercial license and instrument and multi-engine ratings. He had never flown off water when he soloed his Trojan - from land, of course - but likely will have a water rating by the time you

are reading this.

The Trojan was not Billy's first homebuilt project. He has built a BD-5 but it has not been flown. "Dave Thurston says he will whip me if I try," he laughs. He also has another BD-5 still in the factory crate. Unlike some BD-5 owners, he is not bitter about the experience. In fact, he credits the building of the Bede airframe with providing him a good education in aircraft metal work - an education put to use in building the Trojan. One of those persons who has to have a project of some sort going all the time, Billy is currently about a third of the way through a Skybolt. He's obviously not afraid of work!

And speaking of work, I asked for some numbers on the actual time and

expense involved with the building of 1378J. Billy says he has about \$25,000 in cash in the airplane and figuring 25 hours per week for 7½ years, he has about 9,750 hours of labor invested. At his current straight wages - no overtime - he figures he has about \$125,000 in personal labor in his Trojan! That doesn't bother him, however. Where else, he reasons, could he get a brand new amphibian with the land, water and air capability of the Trojan for that price?

Not to mention, of course, the satisfaction he derived from building the airplane, the new friends he met and the fun he expects to have in the future flying the Trojan. Altogether a very worthwhile project, Billy believes.