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Don't You Dare Call a Wren a "182!"

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General Aviation pilots are dreamers. When we aren't dreaming of perfect weather and flawless landings, we are cloudy-eyed with dreams of perfect airplanes.

It isn't hard to imagine such a plane. It would be able to carry at least four people in relatively stable comfort — at least as comfortable as a four-door car. It would have to be extremely easy to fly, and would be very forgiving if you got yourself into a bind.

A cruise speed of around 150 knots would be nice. That's fast enough to get you where you want to go in reasonable time, slow enough to be no huge mental challenge in keeping up with it. At the low end of the speed range wouldn't it be nice to be able to keep flying at, say, 45 knots? Just think of the small turning radius you could get at 45 knots...

While we're dreaming, why not make the aircraft capable of flying out of your back yard? How much room should it take for this bird to get airborne? Let's settle on a conservative takeoff roll of 270 feet, and a distance of 560 feet to clear an obstacle 50 feet high.

Landing? You say your dream plane would have to land in your back yard, too? No problemo... Remember we're dreaming and in a dream anything is possible. How about a landing roll of 205 feet? If you have to land past that fifty foot obstacle, we'll have to extend your back-forty runway to 454 feet. You'll touch down at 35 knots.

Suddenly, with a dream plane like that, all sorts of other dreams become a possibility. For example, take crashing (please).

According to studies by FAA crash gurus, if you impact your aircraft upon the ground at speeds exceeding 50 knots, chances are you will seriously hurt yourself and anybody else aviating with you that day. What would happen if our Dream Plane could touch down in the trees or rocks at 35 knots? Your chances of surviving the impact with very little injury would be pretty good.

That assumes you lose the engine and can't find a clearing of three to four hundred feet to set your dream bird down on. Your "prefect plane" would have roughly twenty times more clearings to choose from than you had in your run-of-the-mill general aviation "spam-can."

One of the major draw-backs to flying on instruments in a single engine aircraft has been the vexing question: "What do you do when you are flying through 200 and 1/2 weather and the engine quits?" Basically, in most general aviation aircraft, you are seriously in the "hurt locker" and the best option you have would be to slow to an approach speed of seventy or eighty knots and await a very painful impact. For that reason, many pilots only fly twin engine aircraft when the weather gets very low. The trouble with that, of course, is that they don't stay very proficient in these twins. It's impossible to be real sharp in a twin if you only fly it a few hours a month during spells of poor weather. So when these guys lose an engine they are already way behind the power curve skill-wise, just when they need their skills the most. Another thing these instrument pilots forget is that many light twins won't climb on one engine, especially the older used ones!

Our single engine dream plane would make instrument flying a safe snap in the lowest of weather. First of all, it's ability to slow to very low airspeeds could soften the blow of the most nasty turbulence. Zero-Zero ILS approaches would be possible in such an aircraft because you could slow to such a low speed that, even if you got a little off the centerline, you could stop before hurting yourself or the plane. Heck, you could probably land such a plane SIDEWAYS on most instrument runways in this country and still stop safely.

Of course, you know that such an aircraft already exists. It has been around since the mid 1960s and it is still being produced today, after a 15-year hiatus.

The Wren was originally hatched by the late James D.L. Robinson, who is perhaps best known as the aerodynamic wizard who invented the "Robinson" STOL modifications. After getting his

1967 Wren 460 Beta

Base Price	$33,650
Gross Wt	2,800 lbs
Empty Wt	1,697 lbs
Useful Load	1,103 lbs
Cargo Cap'y	790 lbs
Power Loading	12.2 lbs\hp
Wing Loading	16.09 lbs\sq ft
Propeller	82" Hartzell/Wren Beta-Control System reversible
Fuel (standard)	60 gals
Engine	Cont. O-470-R, 230 hp, normally aspirated
Top Speed	160 mph
Cruise Speed (75%)	153 mph @ 6,500 ft
Cruise Speed (65%)	143 mph @ 6,500 ft
Fuel Burn @ 75%	14 gph
@ 65%	12 gph
Range @ 75%	601 miles
@ 65 %	655 miles
Service Ceiling	19,200
Rate of Climb	1,080 fpm at Sea Level
Takeoff Run	270 ft
Takeoff / 50-ft Obstacle	560
Landing Roll	205 ft (270 w/o Beta)
Landing / 50-ft Obstacle	454 (555 w/o Beta)
Stall Speed, Flaps Down	26 mph
Takeoff Speed	35 mph
Best Rate of Climb	1,080

degree in aerodynamics at Iowa State College and a business degree from Harvard, Robinson worked for the Helio Aircraft Corporation as a design engineer. The Helio *Courier* is one of the most phenomenal STOL performers ever built. Its leading-edge slats, spoilers, and 75-percent span ailerons allow the *Courier* to take off in 340 feet and land in 275 feet. Its full-flap stall speed is a mere 26 knots. The Courier was designed by MIT's Otto C. Koppen, and Robinson worked on the Courier project during his brief stint at Helio.

He must have learned a thing or two; in 1962 he hatched his own prototype STOL aircraft. He called it the "Skyshark," and it did have a rather predatory look about it. It was a large single-engine airframe (5,000 lbs gross takeoff weight) with huge double-slatted Fowler flaps and full-span leading-edge extensions called "shrouds." Like the later Wren, it had a canard, but the Skyshark's canard also sported rudders. This strange-looking aircraft was hauled around by a 420-hp engine, and according to Jane's All the World's Aircraft, its performance was as unusual as its appearance: Full-flap stall speed, 17 knots; takeoff roll, 85 ft; landing roll, 35 feet.

The Skyshark probably offered more STOL performance than anyone could be expected to want or need. At least that is what Robinson concluded. His proof-of-concept plane was the only one ever built. The projected cost of manufacturing the airplane and doubts about the demand for such extreme STOL performance kept the Skyshark from ever going to market.

From an engineering perspective, however, the Skyshark was a triumph and Robinson used what he had learned to develop the Wren. He also turned to A.E. "Doc" Morris, an aeronautical engineer and veteran bush-pilot, for help. In 1964, they formed a new company, the Wren Aircraft Corporation, and the Wren was certificated by the FAA.

The Wren was popular almost from Day One and sales increased steadily from 1964 through 1967, the company's best year and, ironically, its last.

In all, the Wren Aircraft Corp. built more than 200 Wrens in that period. Some 60 or 70 of them went overseas and nearly 75 percent of the total production is still believed to be in service.

The Wrens built during this period were very similar to Todd Petersen's 260 SE/STOL in many respects. One major difference was the earlier Wren's reversible-pitch prop. Designed to improve short-field operations, that prop was probably too complicated and too maintenance-intensive for bush flying. It was also smaller than a normal prop, which meant less "oomph" on takeoff.

In 1968, with the Vietnam War in full swing, the Air Force took an interest in the Wren's STOL talents and the Wren Aircraft Corp. began working on a STOL version of the Cessna O-2, intended for night reconnaissance. The O-2 (a beefed-up Cessna 337 in military gray) was doing Forward Artillery Control duty and looking for other roles. The company was also quietly working for the Air Force on a prototype military version of the Wren.

Military R&D was costly and when the Air Force rejected both of the prototypes, Wren Aircraft Corp. was in trouble. That same year, an engine fire and subsequent crash in a prototype Wren took the life of Doc Morris. Losing military funding and the head of R&D was too much; in early 1969, the company filed for Bankruptcy.

Robertson was already long gone. Way back in 1964, for reasons that aren't clear, the Board of Directors had voted him out of his position as head of the company not long after the Wren was certificated. Robertson went to work for Boeing and, in 1966, started his own company again. The Robertson Aircraft Corp. was a success with its founder's line of STOL modifications, some of which incorporate lessons learned on the Wren, including the distinctive drooped ailerons and leading edge cuffs.

The Supplemental Type Certificates belonging to the bankrupt Wren Aircraft Corp. were sold to a Wichita aeronautical engineer named Galen Means, who did nothing much with them. In 1977, he sold them to Todd Peterson, a Nebraska airshow pilot and aircraft repair shop operator. Peterson refined the tooling for the Wren but didn't have room to build it in Thedford, Nebraska. In Buckeye, Arizona, he found the room, the flying weather, and lack of interruptions he wanted and began building his version of the Wren. In the mid-1980s, Peterson moved the operation to its current home in Ashland, Kansas, west of Wichita.

The Wren Aircraft Corp. took a stock aircraft, the Cessna 182, and turned it into a totally new bird. This result fulfilled just about every dream of the general aviation pilot. If you could only add afterburners, an ejection seat, and some guns, every G.A. pilot in the country would be in love with it!

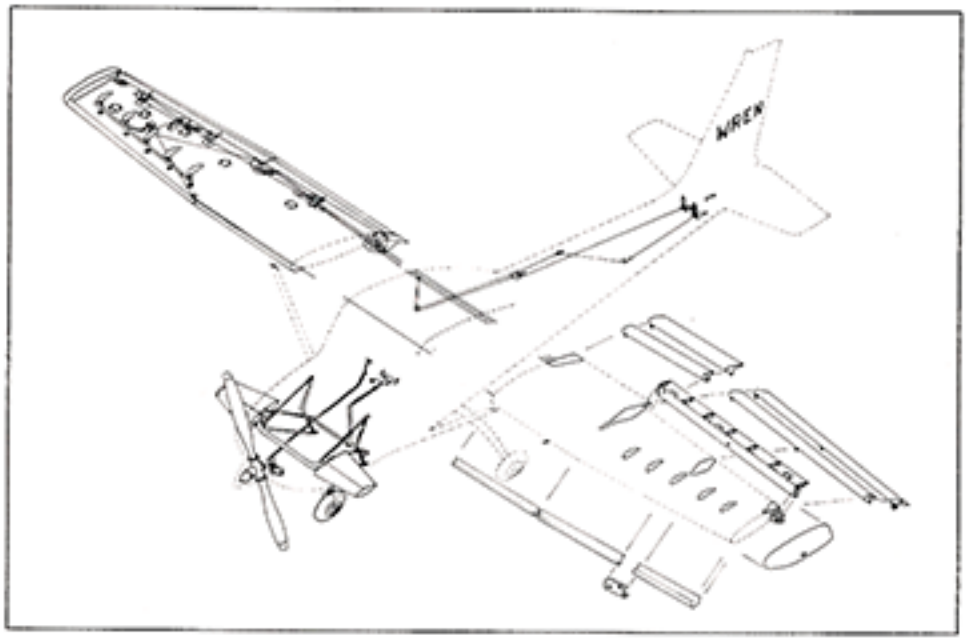
Here, on C.O.O. member Michael Shyne's Wren, you can see "Wren teeth" on the left wing. These teeth improve slow flight aileron effectiveness and adverse yaw. (Photo by Ron Guerin)

DON'T YOU DARE CALL A WREN "A 182"!

Wren owners (at least those owners of Wrens built between 1964 and 1967) are quite uncomfortable about calling a Wren a "modified 182" and they are right. Calling a Wren a modified 182 is like calling the space shuttle a "modified Jenny." The Wren factory took a stock Cessna 182 and added over 1,064 Wren parts and over 2,114 pieces of standard hardware to convert it into a dream plane.

The most striking difference between a Wren and a Skylane are the canards on the nose. These two "mini wings" are

The Wren Aircraft Corporation took one stock 182, added 2,114 pieces of standard hardware and 1,064 pieces that no one had ever seen before, and called it a "Wren." Its owners call it "amazing."



placed on the cowling just aft of the propeller to add to the stability of the bird at very slow speeds. Their location just behind the prop allows the canards to use prop wash for lift. One of the major problems with using a nose wheel aircraft for STOL work is the beating the nosewheel takes on the takeoff roll. Using the canard, the nosewheel on the Wren leaves terra-firma at ten knots. According to the Wren stats, these little mini-stabilizers add over 100 fpm to the total rate of climb. The canards also help keep the pitch attitude at a reasonable angle during slow flight operations. The "nose stabilizer" is controlled through a mechanical interconnect.

Just in front of the more noticeable canards is an optional fully reversible prop. This Hartzell prop was the first reverse-pitch propeller to be used on a single-engine reciprocating-engine aircraft. Beta range (when the prop has zero pitch, positive or negative) is enough to stop the aircraft on landing at 200 feet. With the full reverse option the prop makes it possible for you to back your bird up after landing. If you use the full reverse feature in the air, be ready for some helicopter like performance in the descent.

Heavy duty landing gear and tires were an option and were recommended for serious bush flying.

THE WING IS THE THING....

Obviously the most important feature of any STOL craft is the wing used to do all that fancy stuff. The Wren wing is a quantum leap above your average General Aviation Airfoil. Let's start our wing tour at the leading edge.

The front part of this wing is adorned with leading edge "cuffs" which add a little bit of leading edge camber like a leading edge "slot" does on airliners, but unlike the jet's slots, it has no moving parts to break or malfunction. The cuff moves the burble of a stall further back over the trailing edge of the wing, making stall speeds lower and stall recoveries a little easier on the pilot.

Moving back from the leading edge to the top of the wing you notice "Wren teeth." These look a little like the boundary layer control strakes found on some jets, but these teeth are installed on the Wren to improve slow flight aileron effectiveness as well as adverse yaw. The teeth are mechanically linked to the ailerons. At normal cruising speeds the teeth are streamlined to the airflow. When an aileron rises the teeth turn broadside into the slipstream to pro-

duce a balancing drag to offset the drag of the down aileron on the opposite wing. This little function not only directs airflow over the up aileron but almost eliminates adverse yaw.

Full-span double-slotted flaps adorn the trailing edge of a Wren's wing. They can lower to 30 degrees and are designed to add 87% to the wing's lift coefficient. While most STOL aircraft depend on very powerful engines dragging aircraft with huge dragging flaps and spoilers to get their STOL job accomplished, the Wren uses full-span flaps to add lift (and not much drag) to the equation.

When you have such large configuration changes, keeping up with the trimming requirements can be a real chore in most aircraft. Even "Heavies" like the MD-88 and 727 require huge pitch trim changes to keep up with flap and slat extensions.

The Wren has an automatic pitch trim system. It is controlled by the flap motor and raises or lowers the entire horizontal stabilizer of the tail in order to offset trim needed during configuration changes. The pilot still has the traditional trim tab on the elevator to help with power changes and other trim needs. This automatic trim system translates into 10% less landing distances.

Another feature that helps flap control is a flaps-up button on the control wheel. After landing you can push this button and dump all the flaps, putting all the weight on the wheels for braking. Use this button with care. On approach at 45 knots dumping all your flaps could lead you into a very bad day...

All these goodies make it possible to do STOL operations without all the high pitch attitudes you are used to seeing such aircraft use.

All the Wren mods were designed with field maintenance in mind and even the engine cowl, encumbered with the canards, can reportedly be removed in ten minutes.

What you get after all this re-design and monkey-motion is a dream airplane. Using sound engineering and common sense the Wren and its newer versions answer the needs of most general aviation pilots. All this sounds great, you say, but what about cost? How much is this dream bird going to cost me?

Like most dreams, the Wren doesn't come cheap, although I think it's less expensive than you might imagine. Just about every variation of the 1992 version of the Wren translates out to a price of around 97 grand. This price is for a completely remanufactured "new" condition bird with a full warranty. In other words, for just about the price of a new 172 (if they were still making new 172s) you can get a new STOL dream bird.

The 1967 Wren 460 had a base price of $33,650, or $31,875 without the reversible "Beta" prop. Finding current prices on the original Wrens is not easy; finding an owner who wants to part with one is nigh onto impossible. Michael Shyne, whose 1965 Wren 460 appears on this month's cover, said he searched "for a long time" and with great difficulty to find a Wren that was for sale. But he also told us that the rewards of owning such a magnificent bird are well worth the trouble. ☆