

Boom in Two-Place Baby Biplanes

(From *Private Pilot*, 08/1973, Page 12)

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Photography by Paul A. Wilkinson (Cover photo)

WHEN YOU'RE USED to looking at Waco UPF-7s and Stearmans and Travelairs as two-place biplanes for fun and games, the current crop of diminutive two-seaters look like mosquitos along side eagles. Once you get inside, however, your view will change; in fact, your entire perspective will be rearranged.



Ready for another flight in his MA-5 Charger is Ed Marquart, designer and builder from Riverside, California. Marquart's homebuilt airplane is one of a growing legion of two-seat, recreation-oriented mini-biplanes.

For some reason that's difficult to pinpoint, a biplane, particularly an open cockpit biplane, seems to add a great deal more gusto to flying. Now whether it's because you're looking through more wires, wings and struts, or because of the wind-in-the-face feeling, it makes little difference: it simply is a great deal more fun to fly that open biplane rather than a fully enclosed, stuffy monoplane.

The biplane seems to want to do more for you, respond more to your commands, give you more fun per second of flying.

The single-seater mini-biplanes have been around for nearly as long as their big, buxom brothers, but it has been only the past few years that the two-place baby biplanes have become popular. And, that popularity is directly related to the boom in amateur airplane building and the resurgence of aviation as a recreation. The homebuilders have discovered that it is a lot more fun flying your homebuilt if you can take along a friend or admirer. Like the popular gum jingle goes "Double your pleasure, double your fun."

Of course, the burgeoning re-interest in aerobatics has a lot to do with the popularity growth of the baby bipe. The littlest ones, the Smith Minis, the EAA Bipes, the Knight Twisters and the Pitts Specials

all have demonstrated their willingness to perform the most intricate maneuver (or gross, if you're less than skilled). Trouble is, only a few people on the ground can watch, and almost nobody can properly appreciate what's going on unless he's right there with you. Hence, the two-place biplane.

The Great Lakes has been around for a number of years, dating back to the late 1920s; it has been a popular classic airplane, much desired for airshow performances, but scarce. It's nearly impossible to find one, at any price. With the advent of all-metal, low-maintenance, high-performance "modern" aircraft interest waned in the Lakes to the point of extinction.

The Bucker Jungmann, another fine design of the Thirties, is even more rare, and those that can be found, domestically or imported, bring high prices.

Thus, mostly the big biplanes, the Wacos, the Stearmans, the Travelaires, were available in the Forties and Fifties, and if a guy wanted to horse one around, he could do aerobatics of a sort. These aren't what you'd call nimble and delicately responsive airplanes -- they're better for what they were originally intended: training.

So, with the boom developing in the single-seat mini-biplanes, people like Lou Stolp started eyeing elongated fuselages, bigger wings and more power -- enough to carry an extra passenger through aerobatics, too. Stolp's Starduster Too, an enlarged version of his Starduster I, has become a modern classic.

Curtis Pitts gave the movement added impetus with his two-place S-2, also an enlarged version of a successful single-seater, which he then proceeded to take through the complicated and costly certification process. He then put it into production, utilizing the old Call-Air plant in Wyoming as his factory. The Pitts S-2 is the only complete, factory-built biplane you can buy, at present, that is fully certificated for aerobatics and airshow work. However, the situation may change soon, as others gauge the market for two-place sport planes.





Whether you turn it upside down, like Art Scholl is doing with the Pitts S-2A at right, or park it on the ground to catch girls with, the two-place biplane represents an object of loving attention. The Pitts is a production-run aircraft, while Lamar Steen's Skybolt is do-it-yourselfer's delight. Both will do aerobatics at the flick of a stick.

One of those emerging, really re-emerging, is the Great Lakes Trainer. Already the owner of a type certificate, granted late in the Twenties, the Great Lakes is scheduled to go back into production, with the first deliveries slated for this fall.

Here, name by name, are the currently available two-place biplanes, both certificated and homebuilt:

GREAT LAKES TRAINER

Plans for the Great Lakes Trainer had been available until February, 1972, when Harvey Swack sold the rights to the 2T-1A to the current Great Lakes Aircraft Company. More than 250 sets of plans had been sold. However, the new company, headed by Douglas L. Champlin of Enid, Oklahoma, plans to build complete airplanes, plus supply certified components for restorers and homebuilders, and thus cannot continue to offer a plans service.

Price and parts lists will be available in August, Champlin says, and complete airplanes will be ready for purchase about the same time.

As can be seen in the photograph, the "new" Great Lakes Trainer is a handsome ship, and if it performs

as well as those we've seen at airshows (restored pre-War II versions), it's sure to be a winner. Doubtlessly the price will be in the \$25,000 category, like the Pitts S-2, as it simply costs that much or more for the parts and labor necessary to build this kind of plane. The engine, of course, will be a modern opposed type rather than the old Menasco inline or Warner radial, likely the 200-hp Lycoming IO-360 equipped with inverted fuel and oil systems.

SENIOR AERO SPORT

Designed by Nicholas E. D'Apuzzo of Blue Bell, Pennsylvania, the Senior Aero Sport also is an outgrowth of a successful single-seater, D'Apuzzo's PJ-260 aerobatic special of 1960. This later aircraft was created especially for airshow work, and created such a sudden interest and demand that D'Apuzzo was prevailed upon for construction drawings. Airshow luminaries Rod Jocelyn and Lindsey Parsons performed the flight testing, racking up some 240 hours on the PJ-260 before the plans were offered.

The first two-place version was called the D-260 "Senior Aero Sport" and was constructed by Bud McHolland of Sheridan, Wyoming. The aircraft currently is owned by Roscoe Morton of Metairie, Louisiana. Again, plans were offered and some 150 sets have been sold; from this, more than 21 aircraft have been completed and flown.

D'Apuzzo offers plans sets at \$150 and from them the builder can construct either the D-260 two-place or PJ-260 airshow special. The D's front cockpit is merely replaced by the PJ's smoke oil tank and extra fuel supply.

Slightly larger than most other homebuilt two-place biplanes, the Senior Aero Sport has a 27-foot span, is 21 feet long, and grosses at 2,000 pounds. Empty weight is 1,400 pounds. To propel it, D'Apuzzo recommends engines from 190 to 260 horsepower, but favors the Continental O-470 series of 225 hp as the best compromise.

The designer also says that the aircraft represents a serious investment of time (about 2,000 man-hours) and money (\$4,000 in costs without the engine); considerable work is required. However, the result is worthwhile—a big, strong, (9G positive, 6G negative) handsome showplane.

JAVELIN AIRCRAFT WICHAWK

The only side-by-side two-place biplane currently available, the Wichawk offers simplification, easy construction and easy flying to the homebuilder. It makes an excellent first project, because it is both simple and goof-proof. Designer David D. Blanton, president of Javelin Aircraft Company of Wichita had the best interests of amateur constructors at heart when he started developing the little ship.

As a matter of record, Blanton started the development in 1964, and didn't make the first flight until 1971. "It takes a long time to develop a perfectly sound airplane with a complete drawing file," he points out. The drawing file, we might add, consists of 50 sheets of production quality prints, for which Javelin charges a nominal \$125.

The Wichawk is designed to meet all FAA criteria, Blanton adds, and easily could become a certified airplane. However, he estimates, production-line planes would cost \$20,000 each.

The cockpit of the Wichawk is 36-1/2 inches wide, the same width as a Piper Pacer, and easily accommodates two men. There's a baggage area that will take up to 100 pounds behind the cockpit, but if you like, you can build the Wichawk as a three-place airplane, with a solo pilot's seat behind the two place front cockpit. If you opt for this, Blanton recommends the use of one of the heavier six-cylinder engines, and the mounting of the battery on the firewall to counterbalance the added weight and moment.

Wingspan is 24 feet, length 19 feet 3 inches, gross weight 2,000 pounds with a useful of 720 pounds. Wingloading is only 10.8 pounds per square foot, so the Wichawk is not a "hot" performer.

Blanton lists the Wichawk's structural strength as 12G positive and 6G negative at full gross.

The maker lists fuel tanks and metal wing ribs as the only preformed parts available; but, because the aircraft structure is so simple, few others are needed.



The newest biplane from Wichita is Dave Blanton's Wichawk, a side-by-side two-seater that is simple to build and easy to fly.

MARQUART MA-5 CHARGER

One of the newer homebuilt designs on the market, the Charger is the product of Ed Marquart, a resident of Riverside, California's bustling Fla-Bob Airport. A craftsman of infinite skill and remarkable oratorical powers, Marquart is much sought after for restorations as well as homebuilt designs.

As with several others, his MA-5 is an outgrowth of a single-seater, his MA-4 homebuilt. But, in the case of the -5, it really is more of a completely new aircraft than an expansion of the old one.

The Charger is a moderate-sized "baby" biplane, and has a 24-foot span and 19-1/2-foot length. Wing area is 170 square feet, about par for a gross weight of 1,600 pounds, which nets a wing loading of 9.4 pounds per square foot.

Designed with the sporting flyer in mind, the Charger is a delightful handling airplane with aerobatic capabilities, though not in the competition category of a Pitts or Acroduster.

The Charger will handle engines from 125 to 200 horsepower, with the bigger engines improving cruise over the nominal 115 mph and giving a better rate of climb (nominal is 1,100 feet per minute).

Though not as uncomplicated as the Wichawk, the Charger nonetheless isn't too complicated to build, though it will take some time. The first one took seven years, but that included all the plans changes and minute modifications necessary to develop the design as well as the hardware.

2-SEAT BIPLANES

Aircraft/Mfr.	Status	Span	Length	Gross Wt.	Engine	Cruise	R
GREAT LAKES TRAINER Great Lakes Aircraft Co. Box 3526 Enid, OK 73701	Production	26-8	20-4	1,580 lb.	N.A.	125 mph	1
SENIOR AERO SPORT Nicholas D'Apuzzo 1029 Blue Rock Lane Blue Bell, PA 19422 Info kit, \$3.00	Homebuilt Plans, \$150	27-0	21-0	2,000	190-260	115-140	1
WICHAWK Javelin Aircraft Co. Wichita, KS 67207 Info kit, \$2.00	Homebuilt Plans, \$125	24-0	19-3	2,000	125-200	130	1
MA-5 CHARGER Marquart Aviation P.O. Box 3032 Riverside, CA 92509	Homebuilt Plans,	24-0	19-6	1,600	125-200	115	1
PITTS S-2A Pitts Aviation Enterprises P.O. Box 548 Homestead, FL 33030	Production	20-0	17-9	1,575	200	152	1
SKYBOLT Steen Aero Lab 3218 S. Cherry St. Denver, CO 80222 Info kit, \$3.00	Homebuilt Plane, \$50	24-0	19-0	1,650	125-260	130	N
STARDUSTER TOO Stolp Starduster Corp. 4301 Twining Fla-Bob Airport Riverside, CA 92509 Info kit, \$2.00	Homebuilt Plans, \$60	24-0	20-0	1,450	125-260	125	2
ACRODUSTER TOO Stolp Starduster Corp. Info kit, \$2.00	Homebuilt Plans, \$60	21-0	18-0	1,600	200	155	N



Two of the milestone aircraft in biplane design are the Great Lakes Trainer (upper left) and the Stolp Starduster Too (upper right). The Trainer dates back to the Twenties, but is being revived in modern dress. The Starduster Too only has a 10-year history, but is a homebuilder's favorite. Redesigned for better aerobatics, it becomes the Acroduster Too (right, designer-builder Morgan Schrack has his hand on the canopy), a nearly all-new design.



PITTS S-2A

Though its predecessor was strictly a homebuilt, the Pitts S-2A (for two place, second version) is a fully certificated aerobatic airplane that can be purchased from your friendly local dealer for something like \$25,000. There are no plans or components for building this one; the only way to acquire it is to purchase it either new or used.

Like its predecessor, the S-2 is an outstanding aerobatic airplane, either for instruction or competition. It doesn't roll quite as quickly as the S-1, and its climb is just a shade slower, but nonetheless it is competition-capable -- it will and can do everything its pilot can ask. Art Scholl, Pitts dealer for the southwest, used his S-2A in last year's international aerobatic championships, and regularly flies airshows with it.

The Pitts S-2 is perhaps one of the smallest of the group. Its wingspan is only 20 feet, its overall length only 17 feet, 9 inches. Wing area is 125 sq. ft., while wing loading is a hefty 12.9 pounds per square foot. On the other hand, the gross weight of 1,575 pounds is on the light side, and allows the Pitts a sporting 7.9 lb./hp power loading.

Power is provided by the ubiquitous Lycoming IO-360, a fuel-injected four-cylinders-opposed engine of great strength and versatility. Output is a nominal 200 hp, and it operates a Hartzell constant speed prop.

The S-2 is a pilot's dreamplane, except for landings. Because solo flight is best done from the rear pit, landings are mostly done blind. Scholl, for instance, approaches on final in a roaring side-slip, kicking the airplane straight just before touchdown in a full three-point flare. The stiff gear doesn't forgive adverse handling.

In the air, it's clearly the leader of the pack, topped only by its newly certificated single-place brother-ship, the S-1S, the world champion (men's women's and team) airplane.

STEEN SKYBOLT

What started out as a high school shop class project now is one of the newer and lovelier homebuilt biplanes. Manual Arts High School shop teacher Lamar Steen decided an airplane designed and built from the ground up was just the thing to keep his students interested and contented, and, by working four periods (45 minutes each) per school day, plus quite a few Saturdays, his classmen got the prototype finished in one year's time.

The Skybolt is larger than the Pitts -- about equal in size to the Charger. It has a 24-foot span and 19-foot length, and grosses at 1,650 pounds. Wing loading is 11 lb./sq. ft., somewhat lighter than the Pitts, but not as light as some of the other two-holers we've covered here.

The prototype is powered with a Lycoming O-360 of 180 hp and the designer says it will loop from straight and level flight even with two people aboard. The stall is at 50 mph and cruise speed about 130 mph.

He recommends engines between 125 and 260 hp, with improved performance commensurate with the power used. He cites a Skybolt built by Frontier Airlines pilot Ken Wells that has a 260 Lyc in its nose; it cruises 170 mph on 75 percent power. Wells built it in 22 months.

Steen has had stress analyses run on all structural members and discovered they were stronger than the 8G positive, 5G negative load limits he suggests in his brochure.

He adds that the object of his design was realized when he found the Skybolt could "loop like a large plane and snap-roll like a small one." Control pressures are light and not overly sensitive. Inverted flight, he adds, is completely effortless.

The front windshield can be removed and a cockpit cover substituted if you want to play aerobat or airshow pilot.

Construction of the Skybolt is helped by clear, professional quality prints, and by the availability of some of the tougher subassemblies in pre-fabricated form. There are no machined components required.

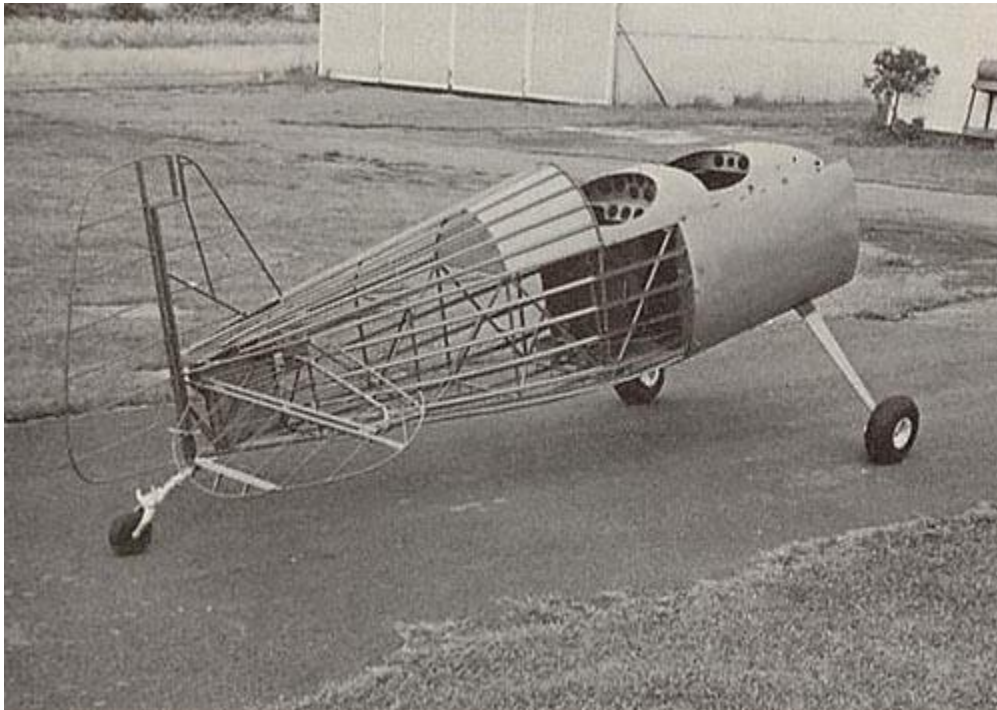
Steen also is developing a set of all-aluminum wings for aerobatic use, that should be ready about the time this appears. He's static tested them for the stresses of aerobatic use and will offer plans for their construction.

STARDUSTER, ACRODUSTER

Granddaddy to the movement is the Starduster Too, developed by Lou Stolp from his highly successful Starduster SA-100 design. More than a thousand sets of plans for the Too have been sold, and the number of completed aircraft exceeds 100. Along with being one of the loveliest small biplanes ever designed, it also has been one of the best flying, a point that endears it to countless pilots.

The SA-300 is on the larger side of the baby biplane scale, measuring a 24-foot wingspan and 20-foot length. It grosses at 1,450 pounds with 450 useful, and utilizes any power from 125 to 260 hp. Wing area is 170 square feet, making wing loading only 8-1/2 pounds per square feet.

Relatively easy to build, the Starduster Too can be completed in two years or less by the average builder, if he learns to weld acceptably. The fuselage, as are those of all of these biplanes, is welded steel tubing which requires lots of hand labor and welding.



The Senior Aero Sport designed by Nicholas D'Apuzzo was a follow-on to his successful PJ-260 airshow special. The SAS can use engines 190 up to 260 hp and performs well with them all. This example was built by Seward Anderson and Ed Siematowski of Iselin, New Jersey; they later sold it to Cal Hadden of New Orleans. Below: the inner strength of the rugged Aero Sport.

The latest version of the aircraft is called the Acroduster Too and is a "convertible" airplane. The front cockpit is of adequate size to accommodate your passenger, but really is meant to be covered over by a solid plate so that you can go aerobating through the sky by yourself.

Much of the redesign was done by TWA pilot Morgan Schrack of Long Beach, California, in conjunction with original Starduster developer Lou Stolp. Stolp recognized the need for better aerobatic capabilities and between the two they redeveloped the whole airplane.

The Acroduster has shorter span and length, has larger ailerons than the Starduster Too, and has a much beefier tail section. Schrack likes spectacular aerobatics and wanted to make the Acro as stout as possible.

In size, it falls halfway between the Too and the single-seater. Its span is 21 feet and length 18 feet, and its wing area about 140 square feet. Power recommendations are about the same as those for the Too, but the obvious powerplant is the 200-hp Lycoming with full inverted systems.

Schrack says the Acroduster's performance is outstanding; roll rate is greatly improved -- nearly to that of the Pitts -- and it does all airshow maneuvers with ease. Yet, he adds, it makes an excellent Sunday runabout, because of its gentle, Starduster-inherited nature.