

V-STAR SA 900



INFORMATION PACK

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V-STAR SA 900



At a time when both horsepower and cost are going up and up, it was considered a good time to design and introduce the V-STAR SA900. A low-cost, low-horsepower, fun machine. It is inexpensive, easy to build, and very easy to fly. The light wing loading insures a slow landing speed and short takeoff. Stability is excellent and ample control surfaces give rapid response to light control pressures. The structure is stressed to withstand both plus and minus 9 G's, so it is a good Sunday afternoon aerobatic machine. Horsepower may vary from 60 to 125. With the 65 HP Continental, the rate of climb is about 600 fpm, cruise speed is 75 mph, stall speed is 35 mph. This aircraft also flies well with a Rotax, Subaru, Suzuki, or Lycoming engine. The fuselage is constructed of welded steel tubing, and the wings have spruce spars and plywood ribs with 1/4" cap strips. Raw material kits as well as kits with the tubing cut to length and scribed for fitting are available. Wing Kits may be bought with finished spars, spar plates, ribs cut out, and fittings cut to size.

This is a small, low-cost airplane, but not a cheap one. It has classic Starduster lines and is a beautiful machine that you will be proud to own.



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V-STAR SA 900

The new Sport Pilot Classification: By Ken Nowell

Stolp Starduster Corporation was looking closely at the upcoming notice of Proposed Rulemaking (NPRM) which is expected to be published in early April (of 2001) and would relax the rules for pilots in a "Sport Pilot" category. This category would require written and practical tests, but no third class medical exam, and would allow pilot to operate and carry a passenger VFR daytime conditions in an unpowered or light single engine two place aircraft.

A new subcategory to FAR Part 21 would create a means for most sport aircraft currently operating outside the limits of the FAR Part 103, and weighing under 1,232 pounds and with a stall speed of 44 mph or less to become licensed as experimental "light" aircraft to be operated by sport pilots. These "light" aircraft would not have to meet the 51 percent rule, which requires owners have to build 51% or more of their aircraft.

The Starduster V-Star would fit into this classification:

Empty Weight: 649 Pounds
Gross Weight: 1,000 Pounds
Stall Speed: 35 MPH
Limit Load: +/-6G @ 1,000 lbs

(Taken from the Starduster February 2001 Magazine)

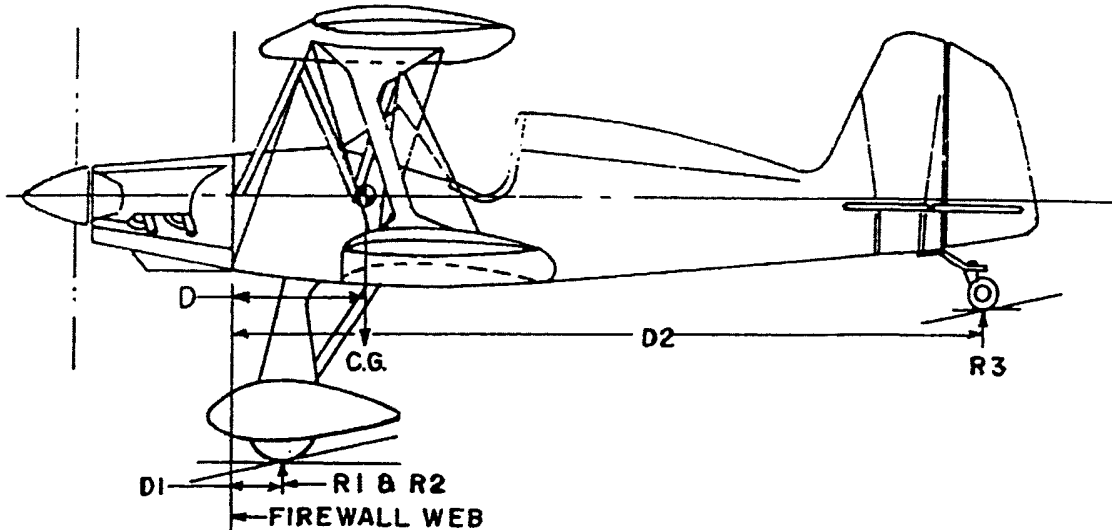


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V-STAR SA 900 WEIGHT & BALANCE



HORIZ. DATUM: TOP LONGERON - SHOULD BE LEVEL

VERT. DATUM: FIREWALL WEB

FWD C.G. LIMIT: 22.5

AFT C.G. LIMIT: 29.5

EMPTY WEIGHT C.G.

<u>WEIGHING POINT</u>	<u>WEIGHT</u>
RIGHT (R1)	301
LEFT (R2)	306
REAR (R3)	42
TOTAL	649

$$D = \frac{D1(R1+R2) + D2(R3)}{R1 + R2 + R3} = \frac{7587.5 + 6478}{649} = \frac{14065}{649} = 21.9$$

MAX. FORWARD C.G.

	WEIGHT	ARM	MOMENT
AIRCRAFT EMPTY WEIGHT	649	21.9	14065
PILOT	150	48	7200
FUEL	45	9	405
FUEL	87	19	1635
	<u>931</u>		<u>23,305</u>

$$\frac{TM}{TW} = \frac{23,305}{931} = 25.0$$

MAX. AFT C.G.

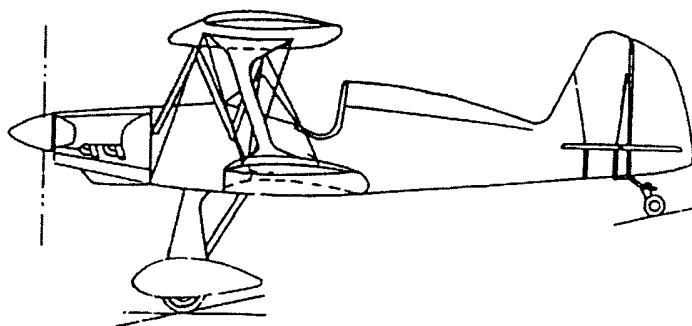
	WEIGHT	ARM	MOMENT
AIRCRAFT EMPTY WEIGHT	649	21.9	14065
PILOT	200	48	9600
BAGGAGE	10	72	720
	<u>859</u>		<u>24,385</u>

$$\frac{TM}{TW} = \frac{24,385}{859} = 28.4$$

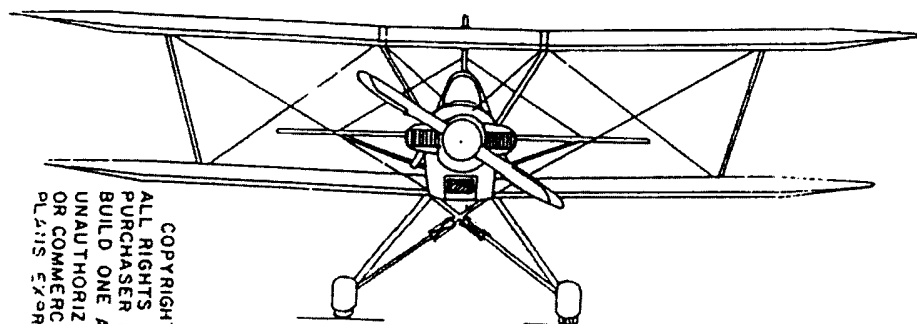
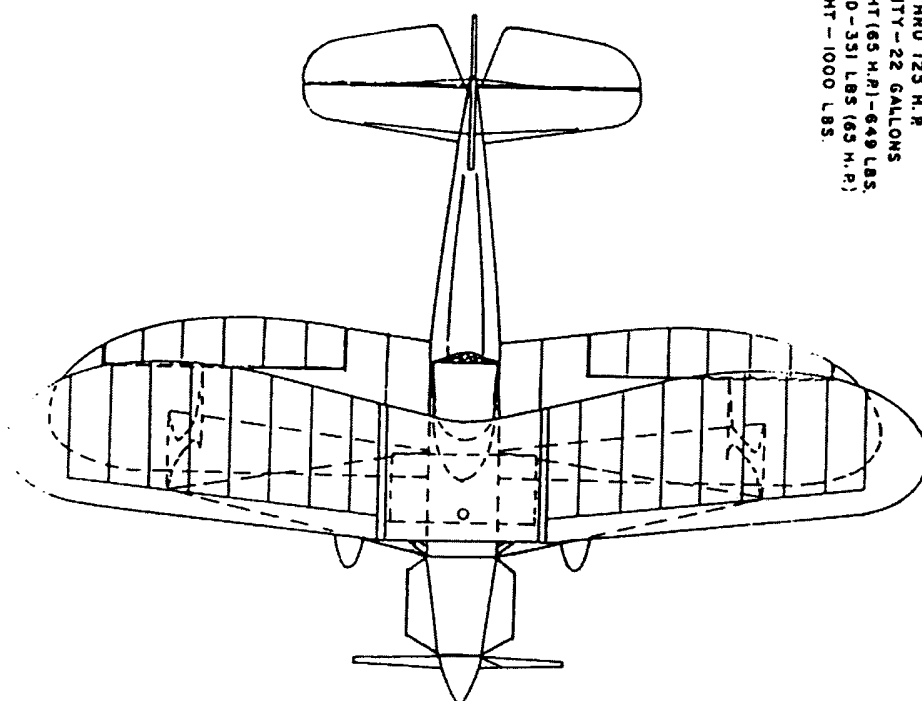


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ENGINE: 65 THRU 125 H.P.
FUEL CAPACITY - 22 GALLONS
EMPTY WEIGHT (65 H.P.) - 649 LBS.
USEFUL LOAD - 351 LBS (65 H.P.)
GROSS WEIGHT - 1000 LBS.

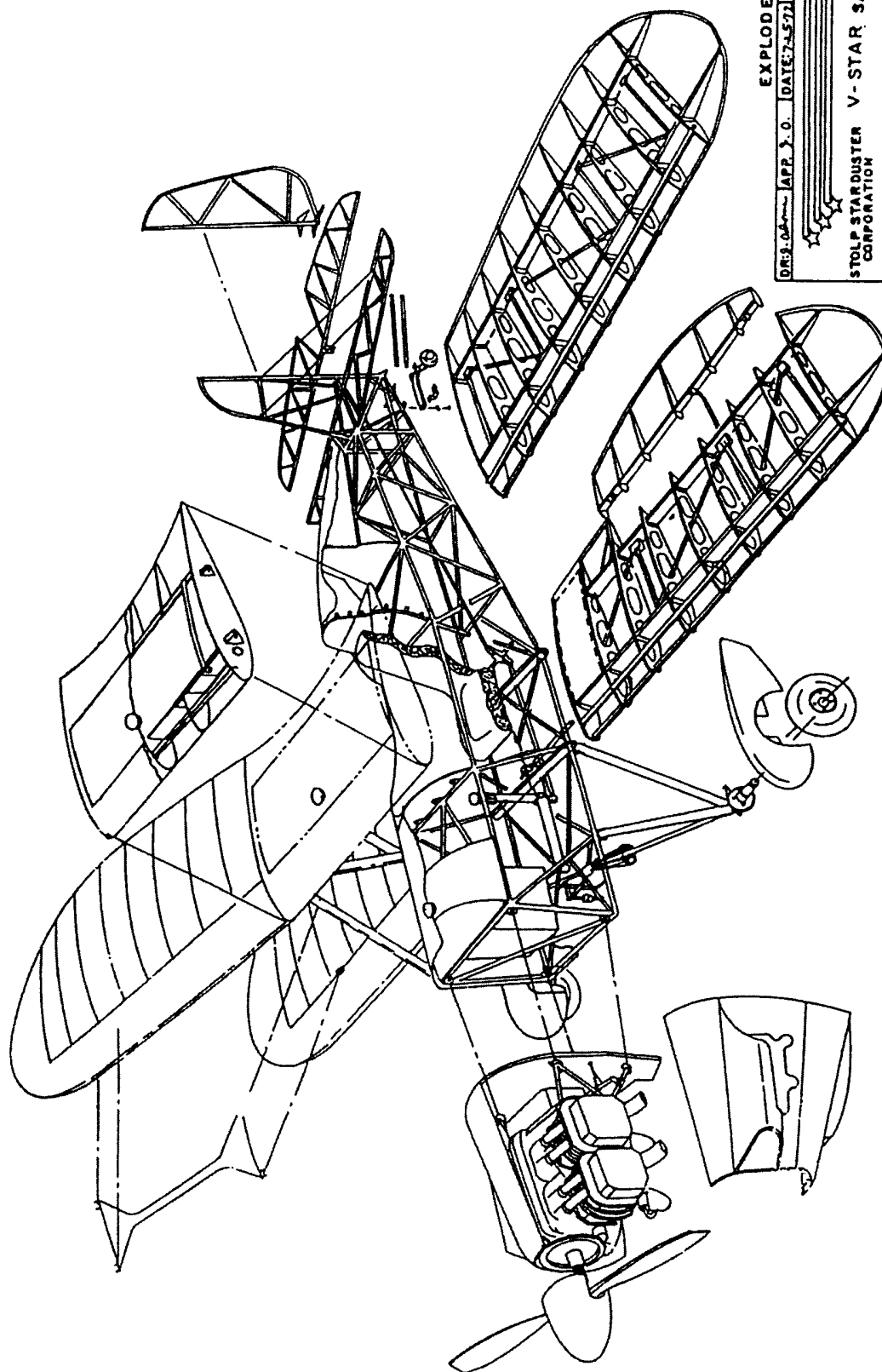


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EXPLODED VIEW

DATE: APR. 2, 00 DATE: 7-571 SHEET 2

STOLP STARBUSTER V-STAR SA 900 CORPORATION



SA900 Postings from www.starduster.com BULLETIN BOARD

**Posted by Neil Jepsen (210.55.250.151) on March 11,
2001 at 11:03:51:**

Hi Fellas,

I have just purchased an SA900 in bits. The A/C flew 15 yrs ago (I owned it briefly at that time, but made the mistake of selling it)

Since then has laid in a hangar going rusty.

I remember it was the most enjoyable flying I had ever had.

Neil

New Zealand

**Posted by Ed Bennett (6445.132.112) on April 27, 2001
at 20:23:40:**

**In Reply to: SA900 posted by Neil Jepsen on March 11,
2001 at 11:03:51:**

I currently have a SA900 with an O-320 installed, but no electrical system. The airplane is a joy to fly. The V-Star originally had a 65hp then a 75hp, before the builder installed the O-320 with a Culver prop. The 150hp makes the V-Star a real performer but with a stall speed around 36 - 40 mph.



Posted by Ed Bennett on October 29, 19100 at 17:23:57:

I have recently acquired a V-Star project and have begun the search for flight numbers. The aircraft is approaching the flight stage after being reassembled. This particular SA900 currently has an O-320, I would assume the stall, approach and landing speeds are close. Any information would be appreciated.

Re: V-Star Performance

Posted by claudio pragliola on December 04, 19100 at 09:03:12:

In Reply to: V-Star Performance posted by Ed Bennett on October 29, 19100 at 17:23:57:

Ed

I am also building a V-Star (I have completed my ribs and fittings are on the way) Looking at the informations supplied by the people at Starduster, the V-Star stalls at 35 mph , has top speed of 90 mph climbs at 600ft/m This figures are for a 65hp powerplant. I have chosen this design for its low wing load and its capability to perform some aerobatics. Anyawy I got the impression that this aircraft is rather "unknown" even at Starduster. I asked the people at the EAA to supply a list of the registerd V-Star. They are about 50. Many with O-320 and a "top speed" of 105 mph. With an heavier and more powerfull engine the stalling and cruising speed should increase a bit. This applies also to the Top Seed (up to 105 mph) Unfortunately I was not able to figure out the Vne which shouldn't change with the power applied.



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SA900 Plans Ordering Information

Thank you for your interest in the V-STAR SA900 plans from Aircraft Spruce. To order plans, please send back the included license agreement, and your method of payment to our Corona, CA location. If you have any questions prior to ordering please feel free to contact us at 1-951-372-9555 or toll free at 877-477-7823.

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V-STAR SA 900 LICENSE AGREEMENT

For and in consideration of the sum of \$ 195.00 Aircraft Spruce & Specialty Co. of Corona, California, does agree to extend to _____ the right to build one V-Star SA 900, said airplane to bear serial number _____. Aircraft Spruce & Specialty Co. further agrees to supply one set of construction drawings and an illustrated parts catalog.

Your Customer order
number is:

This section to be signed by Aircraft Spruce representative
By _____
Title _____
Date _____

I, _____ address _____ do agree to the conditions set forth above and in consideration thereof I further agree that said drawings, instructions, and manuals will remain the property of Aircraft Spruce & Specialty Co., and specifically agree to the following:

- A. I will build one airplane only from these drawings and manuals and that said aircraft will conform to the specifications set forth in these drawings and manuals.
- B. I will not allow another party the use of these drawings and manuals to build a second airplane or part thereof.
- C. I will not transfer these drawings to another party without prior approval of Aircraft Spruce & Specialty Co.
- D. I will not allow these drawings, manuals or instructions to be duplicated.
- E. I will not use or permit the use of these drawings in the design, construction or manufacture of another aircraft.

It is further agreed and I understand that Aircraft Spruce & Specialty makes no warranty, expressed or implied, as to the quality or the safety of this airplane. The buyer understands that no warranty, express or implied, is being given by the Seller or the Buyer as to the accuracy, airworthiness, suitability or flyability of the Plans or the aircraft or engine to be built with the Plans or that the airplane or engine once built is able to be licensed by the Federal Aviation Agency. The Buyer of the Plans shall accept full legal responsibility for the construction, licensing, flight or operation of the aircraft or engine and hold totally and completely harmless from any legal liability or damages whatsoever the principals, owners and employees of Aircraft Spruce and Specialty Company. Further understand that any aircraft constructed with the Plans shall only be built and operated in strict compliance with the Federal Air Regulations promulgated by the Federal Aviation Agency. It is also agreed that while Aircraft Spruce will try to direct any questions regarding the Plans and construction to experienced builders, Aircraft Spruce itself cannot provide any technical builder support on the V-Star SA 900. All subsequent buyers, heirs, successors, or assigns are also bound by all terms of this agreement.

Work Ph. _____
Home Ph. _____
FAX _____
E-Mail _____

Signed _____
Date _____
Witness _____
Address _____

Inasmuch as Aircraft Spruce & Specialty Co. has no opportunity to supervise the manufacture, installation or maintenance of the parts supplied by it, nor any opportunity to participate in the design or manufacture of the various certificated and homebuilt aircraft in which its parts are utilized, the purchaser by placing this order and accepting said merchandise from Aircraft Spruce & Specialty Co. agrees that all materials purchased will be solely at purchaser's risk and that purchaser will indemnify and hold Aircraft Spruce & Specialty Co., its owners and employees, free and harmless from all loss, liability or damage resulting from claims brought by reasons of any alleged failure or defect of any part or parts supplied by Aircraft Spruce & Specialty Co.

This form must be mailed back to Aircraft Spruce in order to process an order for plans.



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Frequently Asked Questions:

V-STAR SA900



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V-STAR SA900

Why is the V-STAR also identified as SA900?

The V-STAR is identified as the SA900 as result of model numbers assigned by Lou Stolp, original Designer. When Jim Osborne Owned Starduster he changed the SA to mean *SPORT AEROBATICS*.

Why is the V-STAR not as well known as the Starduster Too?

Lou Stolp designed the V-STAR before he sold Starduster to Jim Osborne. Jim was more into Aerobatic type aircraft and moved off in the direction of the Acroduster One and Too. The V-STAR has never been promoted in any manner. We intend to promote this aircraft.

How large a person can fit into and fly the V-STAR?

I have talked to people who are 6 foot 2 inches and 220 pounds who fly their V-STAR or STARLET on a regular basis.

Can the wings be remove for winter storage?

There is no quick detach or swing wing design available at the present time. The process would be to remove the flying wires, remove controls and wings and store. Very carefully mark where each piece was removed. To reassemble, reverse the process. It is not an easy process and will require minimum of 2 people, 3 would be better when installing wings and would take about a day to disassemble and two days to reassemble. It would then need to be rerigged, sounds hard but just takes a little time. If everything is marked properly it should be easy.

What are the maximum wing cord, wing span and length?

Maximum wing Cord is 28.5 inches, Wing span is 23 feet and length is 17 feet 2 inches. Length will vary depending on engine used and length of spinner. Height of aircraft is 7 feet 5 inches.

What is wing Area?

Wing area is 141 Square Feet.

What Airfoil is used?

The Clark Y airfoil is used.

Frequently Asked Questions:

V-STAR SA900

When was the aircraft designed?

The V-STAR was designed in 1972.

How many are flying?

We believe there are approximately 50 aircraft in service. We are presently making a survey to contact all owners, builders and pilots to update our records.

What engines can be used to power the V-STAR?

Engine horsepower range is 65 to 125. Engines can be the Rotax, Continental, Lycoming, Volkswagen, Subaru or any engine within this power range. There is aircraft with a Lycoming 0320 installed. Maximum fuel is 22 gallons.

What are the performance figures?

With the 65 horsepower engine empty weight is 649 pounds, gross weight is 1,000 pounds, useful load is 351 pounds, top speed is 90 with cruise at 80 and stall is 35. Climb will be 600 foot per minute.

What is fuel Capacity?

There is a total of 22 gallons. This includes a fuselage tank and wing mounted tank.

What are the design loads?

Wing loading is 7 pounds per square foot. Power loading will vary from 7 ½ to 15 pounds per horsepower, depending on engine selected. Limit loads are +/- 6 G at 1,000 pounds. Ultimate loads are +/- 9 G at 1,000 pounds.

Are they easy to fly? What is the fun Factor?

I have not flown a V-STAR yet. I have talked, face to face with 5 different owners and builders. One had 400 hours on his V-STAR and only parted with it because he needed a 2 place. I am told it is very easy to handle, in the air and on the ground. Flying is great and the only negative comment I have received is the turbulence behind the windscreen gets bad when speeds are very high.



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Bill Boyds' (EAA 169153) of Waco, Texas highly modified V-Star SA900. It is powered by a 140 hp Lycoming O-290 engine with inverted fuel and oil systems. Boyd said he spent about four years building the SA900. If you have questions about the airplane you can call Boyd @ 254-848-9227 or email barboyd@evl.net

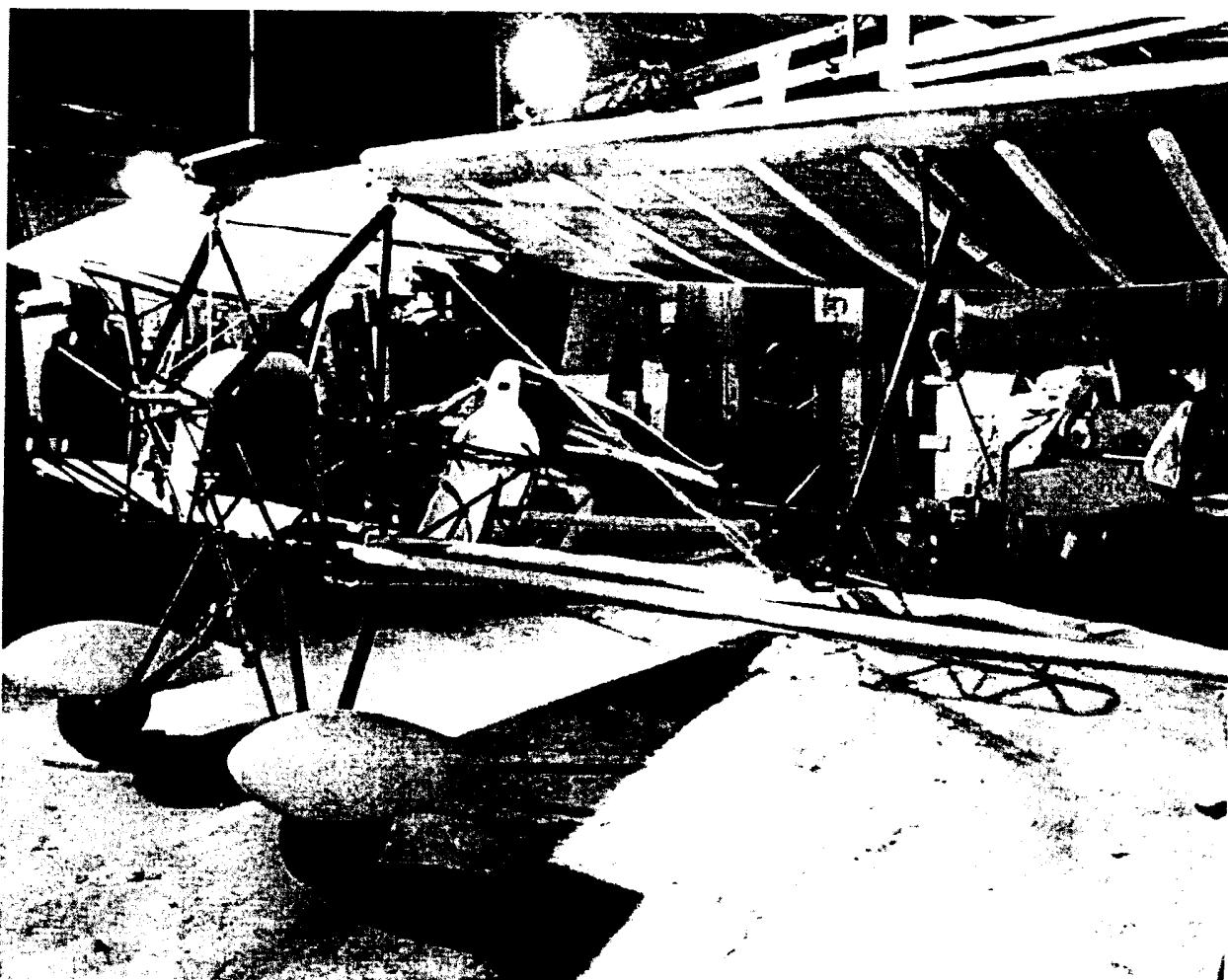




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**V-STAR
SA900
ARCHIVED
MISC.
MAGAZINE
ARTICLES**



(Photo Courtesy of Bell Tel. Co. Bob Frett)

A little 'Cheesecake' for the Bell Telephone Co. magazine photographer and reporter. At the time we rechecked our fittings and extended the center-section leading edge to a slight point to pick up the line from the wing leading edges. Ed Rafacz is framed in the wing tips



THE IMPOSSIBLE DREAM

*Bill Adams / EAA 51011
16746 S. Egan
South Holland, Ill. 60473*

OSHKOSH 1972 — "Say, Dick, that's a sharp looking airplane comin' in, what is it?"

"Looks like Stolp's new V-STAR. John Shore is purty."

"After looking this over, Dick, I like it more and more. I think I'll build one. I've gotta '65' that will fit real nice."

"I'll tell you what, John, you sell me that extra '65' you've got and I'll build one with you."

"YOU'RE ON!"

And so began one of the most ambitious projects within EAA. After that inauspicious beginning, Dick Fry and John Zimmerman mentioned their plans to a few other Chapter 15 members and before the week was out, 3 or 4 others joined in, figuring that they could all take part in constructing the jigs so the same could be used by all.

Returning home from Oshkosh, Dickie bird and Big Bad John weren't too sure who was definitely going to be involved in the project and since they were now

thinking in terms of buying materials in bulk quantities for a better price, they wanted to hold a meeting to formalize the project. A notice was placed in Chapter 15's Newsletter that anyone interested in this project would meet in the Chapter's Library immediately after the March 1973 meeting with starter money in hand.

Twelve disciples showed up and the Dream began to look more like a nightmare. The twelve disciples became the V-STAR BUILDERS with Lloyd Turner as the Treasurer. All members would be required to join the Chicago Area Sports Aviation Association, which is composed of dedicated EAA members who pay monthly dues to support and maintain the Chapter's meeting room, shop, astroport and hangars. Most of the construction work would take place in our own shop and final assembly in our own hangar — all located at Lewis Lockport Airport in Lockport, Ill. (We also have our own coffee pot and all are welcome to stop in to see us and our project on any weekend.)

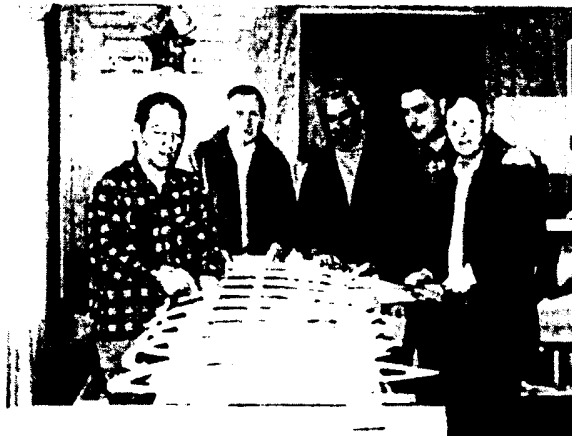
Another meeting was held with Mark Foote of B & F Aircraft, Oak Lawn, Ill. (who has given us immeasurable engineering advice and assistance), and \$1600.00 was

SPORT AVIATION

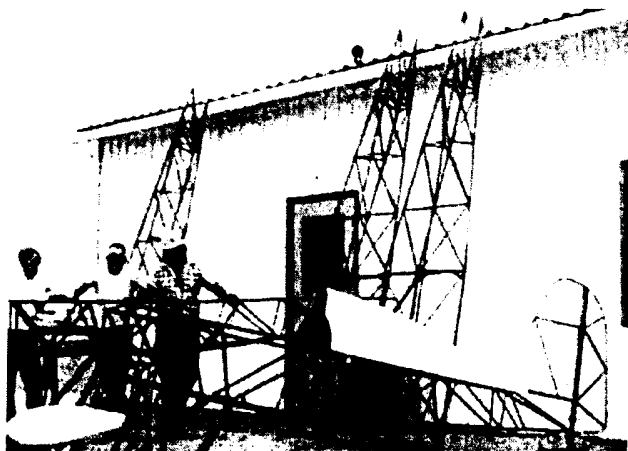
spent on 414 steel tubing. "A small step forward for mankind, a giant leap for the V-STAR BUILDERS!" That just about blew the bankroll and it was time for another raise. The hard facts of life were learned in a hurry. Even buying in bulk, at a savings, aircraft materials are expensive. This was May of 1969. When the work was no longer started, it had to be delayed as we readied the building and area for our second annual fly-in breakfast.

Chuck Bradford, our expert Wood Worker, took charge of the jig making and eventually the basic wing construction and the Impossible Dream began to shape up.

In the meantime, Dick Wunderlich, President of the Bonanza Chapter No. 117-08R, that also meets in our building, had an excellent suggestion. He is the Industrial Arts Shop Teacher at the local high school and suggested that we take the evening welding class about to begin and weld up our airframes in school under his expert supervision. About 6 members complied and in a few months, all 17 basic airframes, tail leathers, vents and struts, were welded, oiled and stored.



(Photo by Bill Adams)
Left to Right — Ed O'Connor, Dick Fry, Lloyd Turner, Bill Adams and Chuck Bradford, utilizing Chapter 15's meeting room for wing construction. It's WARMER than the shop and we clean up before the second Friday of the month.



(Photo by Bob Deutsch)
Left to Right — Jerry Hrdy, John Zimmerman, and Ken Patrick proudly posing with 2 V-Stars on the Gear. Three other BASIC fuselages are leaning against Chapter 15's Shop and Meeting Building. Seven more are stored inside.



(Photo by Bill Adams)
Lloyd Turner and Ed O'Connor hold the elevator and horizontal stabilizer which are complete, including the finish coat of blue trim.



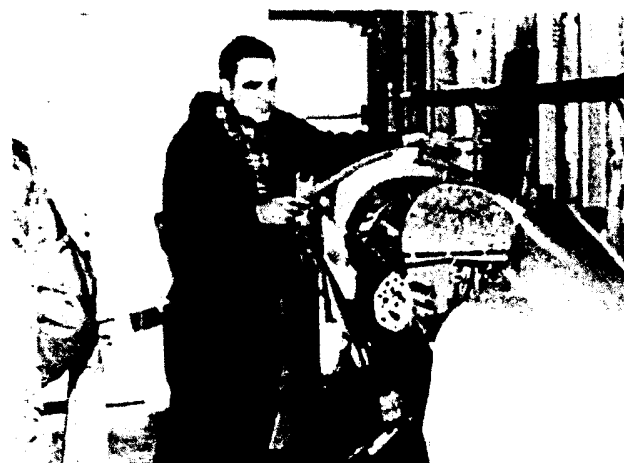
(Photo by Bill Adams)
V-Star No. 1 is up by further wiring in this interior section. Note the support fuel tank between the fuselage and the Fry's tank in the air. If you want a seat for your two child, call us on Fry!



(Photo by Bill Adams)
Ken Patrick showing two of his children how to shape a piece of foam and fuel proof it with epoxy to act as a support for the main cabin floor seat. Hasty supplies are two more full length epoxy coated strips of foam for additional cabin weight supports. The leading and trailing edge of the main cabin floor are covered with foam, fabric and epoxy.



(Photo by Bill Adams)
It fits like a glove — STRONG LIKE BULL!



(Photo by Bill Adams)
Well, it's my camera and I'd like to be immortalized on film. Bill Adams fitting the cowl over the fuselage fuel tank. In the background are 3 wings complete to the white finish coat and the 4th getting its final check.



(Photo by Bill Adams)
Left to Right — Lloyd Turner, Dick Fry and Jerry Hrdy discussing the windshield retainer. In the background can be seen a second fuselage and a multitude of tail leathers. The aft section of the fuselage has a strip of white where the N number will be masked in and then all will be sprayed blue.



(Photo by Bill Adams)
You see tellias, a long control stick gives you leverage. From left to right — Ed O'Connor, Bill Adams, Lloyd Turner and Chuck Bradford with Dick Fry in the cockpit.



(Photo by Bill Adams)
Dick Fry in the cockpit. Left over the workbench to show some of the trucks. On the table, 120 long and 120 wide. This is a 14 inch 14 pin long and 14 wide. We need to get 40 wings done. About what you see there is a model of the aircraft.



(Photo by Bill Adams)
Bill Adams fitting tubing into the cockpit. The cockpit is a long control stick gives you leverage. From the cockpit.

By now, as in any group project, problems were developing. Some of the fellows just couldn't devote the time to the project and another was transferred out of state. The group purchased their shares, since there was a waiting list of other chapter members wanting in, and held another meeting. It was decided to keep the first V-STAR as a group owned airplane, so that we could all have something to fly until the individually owned airplanes were finished. That way, we could also better evaluate the performance of the little 65 hp Continental before committing ourselves to an engine. Us Healthy guys are considering 90 to 100 hp as a more practical size. The other two shares were readily sold at cost to chapter members who were fairly certain they would be able to devote the time and money to the project and who were thought to be compatible with the group as a whole. No consideration was given to individual talent or ability as a prerequisite at any time.

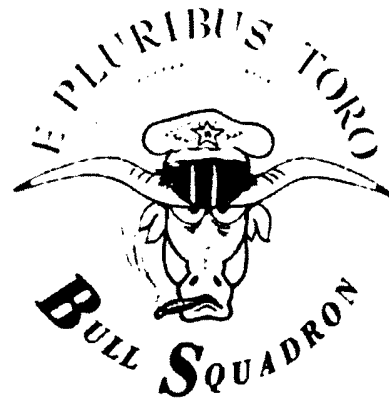
For myself and most of the others in the project, this was to be an educational affair. Without the support of the all-knowledgeable and talented group, most of us would probably never attempt to build an airplane. As a nucleus, we have Dick Fry, Chapter 15's President, Designee, powerplant mechanic, 20 years of Navy and Reserve A & E, builder of a Bushby Midget Mustang and Private Pilot (for at least 100 years, if all of his stories can be believed), I've already mentioned ex-cabinet maker, Grumpy Bradford, T-Craft Pilot Extraordinaire, and his partner, John Zimmerman, who has completed a Jodel F-11-3. A couple of good fabric men. Also, there is Ken Patrick with a commercial pilot rating and alot of general all-around ability and effort. He has probably spent the most time on the project and is scheduled to get the next airplane completed. Jerry McGinnis has an instructors rating, is an electrical engineer and a pretty fair welder. Bill Lockman also has an instructors rating and is a machinist — and when paired off with Jerry, a first rate engine mount builder. Lloyd Turner is a private pilot, parts maker and has stories enough to keep an aviation historian on his toes. Jerry Hrdy, a private pilot with a 172 in his garage and a runway in his backyard was born with a welding torch in his hand. Ed Rafacz, student pilot, is a first rate welder and his son Eddie is learning to do both. Ed O'Connor is a private pilot with a flair for both wood and fabric. Dennis Costello, commercial pilot and industrial arts teacher, is our expert at fabricating control assemblies. And, finally, Bill Adams is a private pilot who somehow became the foam, epoxy, and Dynel specialist.

Actually everybody does a little of everything, with some more expert at it than others. It is, however, a large pool of talent and knowledge and therein lies the real benefit of a group project within the Chapter.

The camaraderie developed over the last two years is also not to be denied. Most of these fellows were only acquaintances before, now we're good friends. It's a closeness we would like to retain, so we decided to develop a group insignia that would somehow project our true image. Since the V-STAR seemed to be designed to fly through forests, the comment often heard from us builders was, "STRONG LIKE BULL." We spend a lot of our time "Shooting the Bull" . . . many of us smoke cigars . . . we're a group, something like a squadron. How about the "Bull Squadron" with a capital B and S? A cigar smoking, dumb looking bull, complete with pilot's cap and our Chapter 15's wings? For a slogan, "E Pluribus Toro", that famous Latin quotation, loosely translated, "All for the Bull" or "The Bull for Many!" Other Chapter members liked it and wanted emblems for their planes also, so it has now become the Chapter member's emblem.

Now that the origin and history of the V-STAR BUILDERS has been covered, you may be interested in

14 MAY 1976



Layout and art by Bob Deutsch and Bill Adams

An inspiration to us all! — Chapter 15's new patch

the modifications we have made thus far. Other than correcting several errors in the plans, we purchased fiber-glass turtle-decks from Rattray of Beloit, Wisconsin. Time saved, money spent — but a beautiful rendition of the "Stolp Curve."

Many changes were made in the wings. Rather than $\frac{1}{4}$ " ribs with capstrip, we used $\frac{3}{16}$ " plywood with lightening holes enlarged and omitted the capstrips. "Strong like Bull!" Instead of aluminum formed trailing edge, oval steel tube was used and brackets were welded to it . . . much easier to get that "Stolp Curve" that way. The leading edge of the wings were built up a la "Rand Method", cutting, fitting and glueing 1" foam panels with Elmers Glue-All, sanding to a fine finish, and covered with Dynel and epoxy. The aileron wells at the rear of the wing were treated in a like manner as were the ailerons, themselves. All was then covered with Irish linen in the traditional method — 1 coat of fungicide/dope, 2 coats of clear dope, 8 coats of aluminum dope, 4 coats of white or blue finish coat and trim. Hoo-Boy. Strong like Bull!

Since the center section has a sheet of aluminum covering the fuel tank, we did it a little different. We dispensed with the plywood cover and paid closer attention to the sanding finish of the foam and squeegeed on several lighter coats of epoxy over the Dynel, sanding between each coat. The final epoxy coat was wet sanded to a smooth finish and then sprayed with aluminum dope and finish dope. The trailing edge of the center section was treated in the same manner, so that it could better withstand the extra abuse it might get from pilot entry and exit from the cockpit.

The control system is as per plans, except on the elevator control rod. In order to reduce the potential fatigue factor, we placed a piece of Teflon around it about halfway, to act as a vibration dampener.

As of this writing, the cowling and engine are going in place and patterns pulled of all aluminum sheet for the next 11 modified V-STARs. With a lot of luck and perseverance, we hope to have No. 1 ready to fly by May 18, 1975 at our annual fly-in breakfast at Lewis-Lockport Airport, Lockport, Ill. We may even have two of them flying at the 15th Annual Lockport Air Show and Fly-In (formerly Joliet Air Show) on September 6 and 7, 1975. Since this air show will be on our home field, we'll be able to place the others on static display, showing the various stages of construction. Be there and see for yourself! "THE IMPOSSIBLE DREAM", coming true and just maybe, we can help nudge you into fulfilling your own dream!



V-STAR ADVENTURE

By Larry Weishaar

Thursday, June 16, was a rather warm, humid day in central Illinois, but not as muggy as the past few days. It was just beginning to cool off in the late afternoon, when, after 4-1/2 years, I came to the realization that there were no longer any compelling reasons why I shouldn't attempt the first flight of V-STAR N2LW.

The past week had been a fairly concentrated frenzy of activity. Jack Schmeltzer of the Indianapolis EMDO had been there on Tuesday, and given the bird a more or less clean bill of health. I never would have believed he would find a pair of bolts on the aileron pushrod attachment, in full view of anyone glancing into the cockpit, without nuts. But he did, and that's the kind of thing that can happen when you're in a hurry, and getting a lot of well-intentioned help from your friends, as we shall see.

As Jack drove off, I popped the top on a can of Pabst, kissed the pretty little pink slip, surveyed the gratifyingly short punch list (aside from that one big boo-boo), and contemplated the job of getting all the miscellaneous pieces back into formation from the inspection strip-down. There she stood, zippers, buttons, and makeup in disarray, and socks down around her ankles, but still a mighty purty sight to her old Dad.

Everything went smoothly the next couple of days and evenings and, with the help of the ever faithful coterie of fellow homebuilders who had contributed so much to the project, Thursday's declining sun saw us make one more fingerprint-wiping walk around, and declare the job done. Oh yes, the new spark plugs to replace the borrowed set arrived just about then, and we made a four-man ten-minute job of removing the cowl and doing a plug change. Are you beginning to smell something?

One of our little clique's favorite remarks on jumping into areas where experience is lacking is "you'll never learn any younger," and, accordingly, they helped me



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strap it on, flipped the lycoming to life, and collectively goosed the summer sky with a three barreled thumbs up salute. With taxi clearance (Negative Stage 3-- I'm not gonna get far enough away for your ghost sniffer to pick me up--), we boogied briskly out the mile or so to the end of 22, and switched to tower. "2LW cleared for immediate takeoff", came thru the magneto noise and, swiftly but accurately making a final count of the wings, I fed in the stinger and watched the tire marks accelerate under the lower panel. Pretty soon I could see over the nose, and then, wonder of wonders, we were up.

My plan, previously worked out with the tower, was simply to orbit the patch at 3000 MSL while I cautiously assayed what happens as you push the lever here and there, and how the assembly reacts when you get it too far back, and after half an hour or so, to return triumphantly to terra firma, and the tumultuous welcome of my three-man throng. Passing thru about 300 AGL I sheepishly remembered I hadn't, in a moment of laziness to get airborne, made a formal runup before takeoff. With 5000 feet or more of concrete still ahead, I figured "better late than never", and backed the key off one notch. No readable drop-swell- but it really should do better than 2250, come to think of it. Another notch (right mag) and BANG, SHAKE, SMAKK. My undershorts went suddenly tight as all the slack sucked up into a convenient crevice, and, cagily deducing that something was awry, I returned the key to "both", which cleared the worst of the problem. I was now keenly aware, however, that the engine was, at best, rough and doggy, and had been from the start. My 5000 feet is now mostly gone, and in spite of the momentary power loss, had been traded for another 200 feet of altitude.

Disguising my normal rich baritone with a sort of tenor vibrato, I informed the tower I'd like, if I may, to make a 280 degree left turn, and land on 30. "Shore," they said, "but be advised the wind is 180 degrees at 12 to 15." Well, it was still running reasonably well, and I knew I could make four or five landing attempts on 22's 8000 feet, so I elected to go on around. Made as good a landing as any I've made since, too. (How is that for hedging?)

We had the offending mag off in a jiffy, and bench checked by the next morning. It pulled about a mile and a quarter spark from every hole. Back on the airplane, it ran like a sick lawnmower. I know you're way ahead of me but, anyhow, I can take credit among the group for finally having sense enough to trace the leads and determine that the bottom left plugs were reversed.

More about flying later. This all began at the 1972 Oshkosh Goat Ropin', when I became suddenly, and completely, enamored of a sassy looking, spindley-assed little blue and white biplane- Those elliptical wings, that sensuous rear deck curve, and those cute little puppy feet said "STARDUSTER," but there was somehow a grace and elegance I hadn't noticed in the proportions of Lou Stolp's other designs, lovely though they are. A tall gent with an aura of quiet dignity seemed to be fielding questions about the airplane, and that was the beginning of a fine friendship with Jim Osborne, designer of this particular bit of fluff, and Lou's successor at Stolp Starduster Corporation. Within minutes, a modest check changed hands, and I had proprietary rights to plans Set #6, for the SA 900.

The first weld was made in October of that year, and construction of the iron parts of the bird went forward rapidly. A lively correspondence began, by mail and telephone, between Illinois and California, with me whining piteously for additional plan sheets (although materials and hardware were always delivered promptly), and Jim adroitly fielding questions about the plans, and approving or vetoing the numerous changes I proposed.

Changes I succeeded in getting past him were-

- (1) Using the O-290-D2, a little heftier than the engines having designer



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approval.

(2) Shortening the ailerons one bay, and providing an additional pair on the top wing.

(3) Using foam/fiberglass for leading edges, aileron wells, tips, etc., in place of sheet metal and tubing.

(4) Converting drag bracing in the lower panels to diagonal tension in place of compression, and mounting the aileron control horn pushrod below the wing instead of above.

(5) Changing the rigid bottom stabilizer braces to tension wires.

I also, without consulting Jim, went to ball-ends on all control rods and wood bushings on the control stick torque tube, installed an elevator trim tab, and built a stabilizing cradle about halfway along the rather lengthy elevator pushrod. The plans are reasonably complete, but possibly a little sketchy here and there for a rank beginner. Two or three bloopers appeared, as may be expected in the development stage, but all were corrected with full distribution to plans holders.

1974 was wing construction year, and I got pretty sick of that job. No real difficulties, just too much of a good thing. Late in the year I put together what I had finished, measured for rigging wires and I-struts (one of the bloopers) and, weighing the whole, (with weight and arm estimates of the remaining components) calculated the required engine mount length. By then I was 90% done, with only 90% to go. (No, that ain't a misprint.) Where in the world the next two and a half years went, I'll never know, but it took that long to cover and finish, get the project to the airport, hang it together, get the engine running, and conduct taxi tests.

Which brings us back, approximately, to the beginning of this story. After I whipped the magneto problem, further initial flights were at least without dramatic value, although the whole planned testing regime has been thrown out of whack by a persistent oil cooling problem. Not a critical one, but I couldn't use normal power settings without seeing that damnable gage get up there and nudge the red line--- not over, just worrisomely close. Because I was determined to get it to Oshkosh, and had less than six weeks to build the 50 hours, I just couldn't take time to make any major changes. So, I fooled around with mostly ineffectual minor fixes, and contented myself with grinding around the test area at about 18" and 2200 RPM with the oil temp at the top of the green. I have, since Oshkosh, pretty well whipped the problem with the installation of an additional oil cooler (now have two Corvair-type coolers in series), but as a result of the delay, I still do not have any really definitive figures on full-power rates and angles of climb, inverted performance, etc.

HERE ARE THE CHARACTERISTICS I HAVE PRETTY WELL TIED DOWN.

The airplane gets off easily in 400 feet (concrete), and full power gives 28" (at 600 MSL) at 2450 RPM and about 70 MPH IAS. The "up" gage pegs and holds at 2000 FPM in that format, but I have some reason to believe it may be hyping itself a little. It do climb good though.

I can now cruise continuously at about 22" (2400 RPM) without exceeding 200 degrees on the oil, and measured ground speed at 3000 MSL is approximately 115 MPH. Full power (oil Temp be damned) at that altitude gives 24-25", and 2800 RPM, and movement at the rate of 132-133 MPH. A swell loop can be made from level flight (flat out) without loss of altitude. (How do I know? Well, it got away from me once or twice.)



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On the low end, I don't know how slow it goes, but it hangs on until the IAS is below the scale. I'm guessing 45-48 TAS. It pays off gently, and recovers nicely in response to the proper stroking. Approaches feel good at 70, with maybe 60 over the fence. The angle of descent at these speeds is fairly flat, and it may be I could safely knock off 10 MPH, because it is, frankly, kind of a floater when you get in ground effect.

With this large, (well, fairly large) range of speeds, trim forces become really objectionable if the elevator trim is just left at cruise, particularly at high high speeds where you really have to hold forward pressure to keep the R/C centered. I'm real glad I put in the trim control; it ain't much, but I can trim to neutral pressure at speeds between 75 and 125 MPH.

Elevator pressures are, to my mind, rather heavy, at least in high plus g modes, but that is probably a safety factor against overstressing things. I have a good bit of mechanical drag in the aileron system, but the air loads seem about right, maybe a touch too light. The full deflection rate of roll is very fast, I think. I haven't much to compare it with, but it is substantially quicker than a Yankee, for instance. The rudder touch seems to match the ailerons fairly well, and there is enough of it available to make a pretty deep forward slip. No spins, or negative g maneuvers yet.

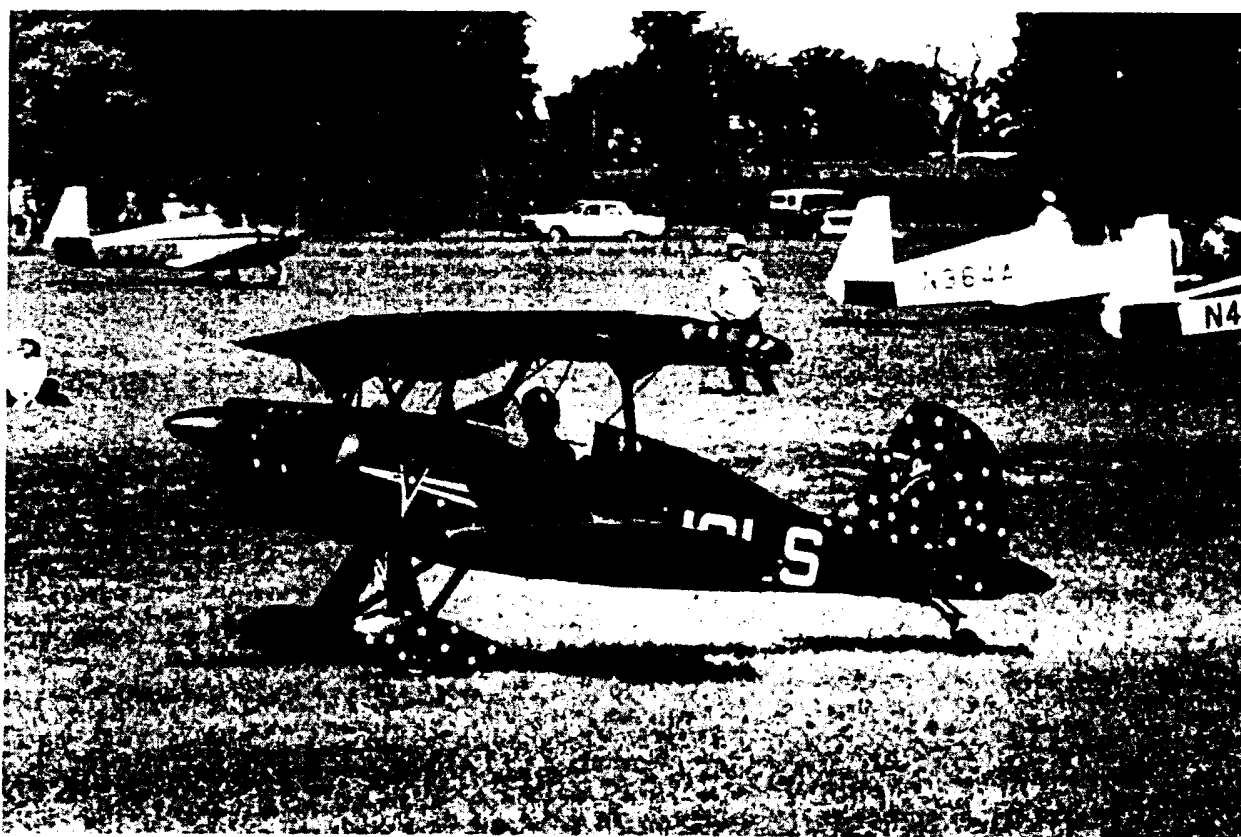
Stability in all axes is surprising. This may not be too desirable in an aerobatic airplane. When I was building time, I routinely left my hands in my lap for extended periods of time, maintaining heading and roll control with the rudder. Once I even spiraled down from 9000 feet in 12 full circles, changing rotation about half way down without ever touching elevator or ailerons.

On the ground, my first reaction was that it was a handful. Some of that may have been attributable to tight shorts, and an unaccountable obstruction in my throat, however. Visibility ahead, of course, is nil until the tail comes up, but takeoffs are no sweat at all anymore. I can usually keep the dotted line between the wheels until liftoff. Rollout is another matter entirely. It has never gotten completely away from me, but unless the touchdown is perfect the next few moments always holds my undivided attention, and I often have the feeling that I lucked out again. It is just a short-coupled little mother with the wheels perhaps a tad too far ahead of the C.G., which, in a decelerating condition, leads to a natural tendency to swap ends, and one must simply learn to love it anyhow.

No "I built an aeroplane" story is complete without a list of Thank-you's; Besides Jim, Manako, and the crew at Stolp, my project owes a lot to my friends and fellow homebuilders, Lee Williams, Bill Bernard, Bill Wilkin, Bob Rutledge, and the Wagner Twins (Tweedledum and Tweedledee), who majored the engine. My long suffering spouse, Betty, put up with the noise, dust, and noxious odors emanating from the basement with remarkable forbearance, although sometimes only thru obviously difficult self-control. I learned, for instance, that the color mauve is accurately generated by a slightly apoplectic complexion with a bit of yellow overspray added.

It will come as no surprise that I am immensely pleased with the "MAYFLY" (git it?) and I hope to see other examples of the SA900 design start showing up. I would be pleased to talk to or correspond with other builders, if I may be of assistance.

LARRY WEISHAAR
1924 North 6th Street
Springfield, Illinois
67202



(Ted Koston Photo)

BUILDING THE

By Jim Osborne
(FAA 14765)

President, Stolp Starduster Corp.
4301 Twining — Flabob Airport
Riverside, California 92509

(Photos Courtesy of the Author)

WHEN I WENT to work at Stolp Starduster Corporation in September of 1971, Lou Stolp was already talking about building a new biplane. It was to be inexpensive, of low horsepower, easy to build, but with the beautiful Starduster lines. His idea, basically, was to take the already successful "Starlet", and make a biplane out of it.

Since I had been designing aircraft all my life, first models, and then the big ones for such companies as Lockheed and Boeing, he thought I might be useful in the engineering end of it.

However, more urgent matters kept pushing the project into the background, and I soon left Starduster to go into business for myself as Osborne Aviation. Lou was very kind and helpful in helping me get started, and

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V STAR

we soon began to discuss the possibility of me buying Starduster Corporation. In April Lou made a modified fuselage from the "Starlet" jig and at the same time we put together a deal which would allow me to acquire Starduster Corporation. The changeover officially took place on May 1, 1972, and among the assets of the Corporation were the rights to the "V-Star" as yet undesignated and unbuilt (except for the fuselage and landing gear).

During May not much was done on the "V-Star". A lot of talking and thinking, and some preliminary design, but not much building. This was mainly due to the learning curve I was undergoing concerning the business, and to Lou working full time to teach me the things I needed to know.

In June work on the "V-Star" shifted into high gear. I was busy seven days a week on the drafting board, and Lou was working the same hours building the little biplane. I found I didn't have time for all the engineering and drawing, and I was fortunate in locating Robert Knight, a Starduster builder and stress engineer employed by North American on the B-1 project. Working nights and weekends he did a tremendous amount of work in just a few short weeks. While Bob and I were exerting ourselves in the engineering department, Lou, his wife Joy, and their son-in-law, Mike Ratz were building the bird. At this stage they were working from sketches, incomplete drawings, experience, conversation and a nice three view, which stayed the same throughout the project.

It was apparent by now that the "V-Star" would not be just a Starlet with two wings. It was a whole 'nother ball game. I think there is a subsection of MURPHY'S LAW which states that it is impossible to change just one thing on an airplane. A change in structure, no matter how trivial, almost always leads to a whole string of changes.

In the case of the "V-Star", the simplified landing gear, and the bottom wing carry through members redesigned the forward fuselage truss. Design studies showed the desirability of a larger tail. This redesigned the aft part of the fuselage. The wings were basically "Starlet" wings, but shortened, with a different sweep angle, different trailing edge, and different fittings. It finally worked out that about the only common parts were the turtleback, gas tanks and engine mount.

It was obvious around the first of July that the "V-Star" would not be finished in time for Oshkosh without more help. So Starduster mechanics Bill Hill, Mike Snow and George Evans started to work full time on it, and everybody on the project worked long hours and 6 or 7 days a week.

On Monday, 17 July, the little bird was ready to fly. Not finished, but ready to fly. At about 2:30 in the afternoon, Lou Stolp climbed in, Mike Snow used his "Armstrong" starter, and the little engine caught and ran beautifully. Lou taxied to the starting point, S-turning for better vision and also to feel out the brakes. He headed into a gusty 10 knot wind and wound her up. After a run of only a few hundred feet he made a beautiful take-off, climbed about 20 feet, and then landed. He taxied back, asked me how it looked from the ground and I said fine. He said it handled normally and he would now take it around the field.

His second take-off was a replica of the first, only he just kept going, climbing at a fairly steep angle, but at a low airspeed. Upon landing, he said it handled beautifully, but needed a small trim adjustment, as slight forward pressure was needed on the stick in level flight. Mike Ratz then took it around and then it was my turn. I headed into the wind and opened the throttle and was off on the most soul satisfying flight I have ever enjoyed. The little beauty handled more like the J-2 Cub I had flown as a boy in North Carolina than anything else. Control response was prompt and adequate, but it was not overly sensitive, as are so many small planes. Down the back stretch, cut the power, maintain airspeed with a little forward pressure on the stick, and 1200 rpm, over the end of the runway.

flare, correct for one bad gust, cut the throttle and I'm rolling. No floating. It was one of the easiest landing airplanes I have ever handled.

After making the ground adjustable trim correction, the little bird flew beautifully. Hands off. Stall speed, power off, was around 35 knots indicated. Power on, I was never able to get a true stall. The nose would go up and stay there, and the plane would just settle, the sinking rate depending on the amount of throttle. It was the gentlest stall of any airplane I have ever experienced.

On the first day, it was flown by six pilots, and all had praise for its easy, responsive handling. During the next seven days it was flown 7 to 8 hours every day, by a variety of pilots. "Iron Rump" Ratz did most of the flying. He would fly it for four hours in the morning, land and turn it over to me for noon flying, and be waiting impatiently for me to bring it back so he could fly some more. However, the log shows it being flown by about 8 pilots that week, including Lou's daughter, Linda Ratz.

On Monday, the 24th of July, the 50 hour restrictions were lifted, and we were free to take it to Oshkosh. I am happy to say it met with a favorable reception there, and more pilots had an opportunity to log time in it.

The little bird has fulfilled our design objectives admirably. It is very easy to fly. Any Cub pilot should have no trouble with the "V-Star". On 65-hp it cruises at 75-80, and climbs at 500-600 fpm, depending on whether you use a climb or cruise prop. Stall speed is around 35 mph. It is a good short field airplane. It is cheap, simple to build, and has nice lines. It will take any engine from 60 to 125-hp. This means it would accommodate the bigger VW engines, from where comes the name "V-Star".

Since Lou Stolp doesn't believe in aerobatics for his airplanes, no aerobatic maneuvers have been performed other than stalls and wing-overs. There is no reason to believe, however, that it would not be a delightful "Sunday afternoon" aerobatic machine. A "V-Star" built according to the plans is stressed for plus or minus 9 G's ultimate, and 6 G's limit loads. With its high lift airfoil, gentle stall, and responsive handling, it should prove a joy for the sportsman aerobat. I am looking forward to the completion of No. 2, and the running of a series of aerobatic tests.

The original "V-Star" has been sold and is now hangared in Pennsylvania. It should be appearing at North Eastern Fly-In this spring and summer.



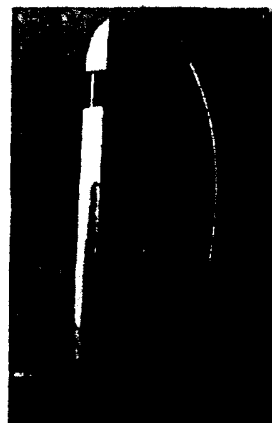
First showing of the "V-Star" at Ramona, California on May 1, 1972 — a long way to go before Oshkosh.



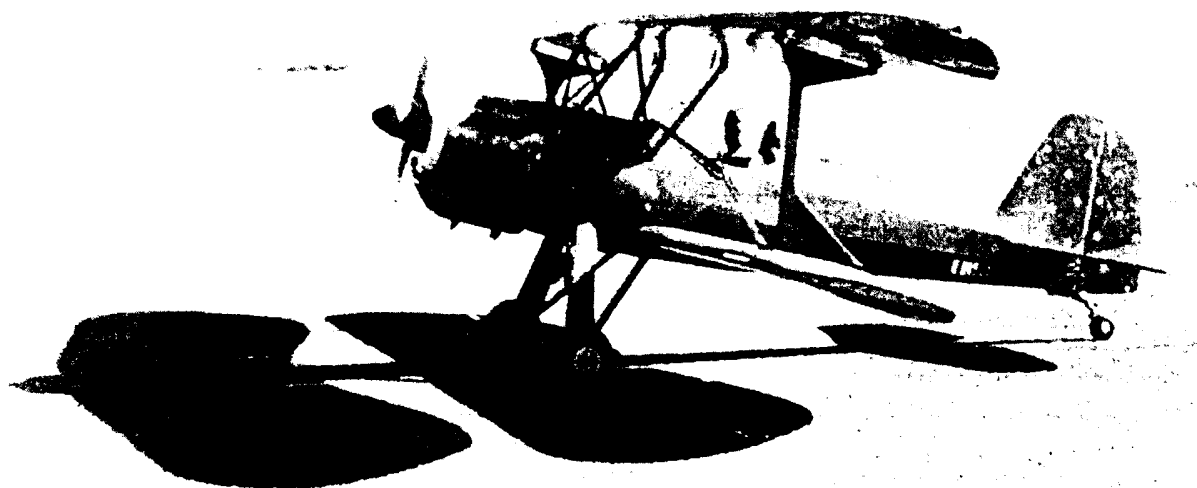
Lou Stolp, right, and his latest design, the "V-Star".



The "V-Star" and the "Starduster Too" at Oshkosh '72.



Right upper wing panel of the "V-Star".



Dear Jim

BUILDING A V-STAR

by Danny Sanders

I started my V-Star in November, 1972. The obvious question is, why? I think biplane is a flying machine that has something special about it no other airplane can offer. The first time I saw L. Stolp's V-Star in Sport Aviation I knew I had to have it no matter what or how long it would take to build. A description of the aircraft characteristics made me feel certain this would be the one. At this same time I had over one year of construction into another project, which I shelved and sold later on. My trip to Flabob, meeting you and the purchase of V-Star drawings followed. If I recall correctly, the fuselage and tail feathers were the only completed drawings. You promised to mail the other drawings as the drafting progressed.

I started construction of the fuselage first, then tail, cabane and landing gear, center section, wings and I-struts. Tubing in the fuselage is all hand fitted, filing all contours and angles. Holes were drilled first and reamed after. I did not experience any difficulty with the drawings. Revisions for landing gear and I-struts were received during the construction. I made three changes from what the drawings called for. First, the horizontal stabilizer is $1\frac{1}{2}$ inches narrower, because it would not fit the fuselage opening. Second, cabane strut bracing wires were replaced with welded streamline tubing. Third, the cabane struts were welded directly to the longerons.

The engine is a modified C75-12 Continental completely overhauled. The propeller is a Ray Hegy 70 diameter x 42 pitch, and the aircraft is covered with dacron, nitrate base and butyrate finish. All materials and hardware are aircraft quality.



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With the help of two friends, at 11:00 P.M. on Friday, August 11, 1978, we started to load the aircraft on a two axle trailer and fixtured wings on the truck. By the time everything was secured and all support gear in the station wagon ready to depart for Mojave, it was 4:00 A.M. Saturday. To safely transport the wings I made special fixtures that proved to be time and effort well spent. Palmdale had very strong winds that day. We were lucky to reach the airport without any damage.

We arrived at Mojave at 8:00 A.M. Assembly of the aircraft started immediately that morning. Joe Mason rigged the aircraft with a Master's Touch and proceeded with weight and balance and measurements of the V-Star. I would like to mention how Joe was able to direct three "dog-tired" men on a very hot day with such even temperament and good humor. I do not think I would have been able to complete this very important task without him.

The next day, Sunday morning, I drove back to Mojave to install the cotter pins and to complete other small items for final inspection. On Monday morning, I took a trip to the FAA, Van Nuys office with all the paperwork, hoping for an appointment within the next three weeks.

The FAA inspector was pleased with the paperwork and said to me, "We are going to Mojave Wednesday morning on other business, so we will stop by and inspect your aircraft." I had no idea that this could happen in two days.

V-Star received its papers with positive comments on the workmanship and general appearance. I was so nervous! The restricted time is 40 hours.

After driving home in the afternoon, I began to realize that the time to fly the V-Star is here, now. For the past three or four days it was so windy at Mojave I thought ... I will never fly my machine.

Saturday morning heading back to Mojave, I was thinking about many things -- wind, taxi-slow or fast, flying, how it will behave, what to do if this or that ... will it fly?

E. Schilling wrote something about flight testing a few years ago, and my plan was to stay with his idea, flying the aircraft instead of getting into trouble with high speed taxi routine.

Upon arrival at the airport, there was no wind at all and the time to show what you are made of was here. I started the engine (which had about three hours total time of short runs at home) and just taxied about 4 - 6 times on the taxiway, s-turns, brakes, temperature, oil pressure, everything was fine. I secured the aircraft wheels with chocks and tailwheel with rope and made a run up. Again, everything looked good and there was no excuse not to go.

I taxied over to the runway, lined up straight and with hardly half throttle I hesitated for a few seconds to advance the throttle fully and she started for the right side of the runway and not responding to the opposite rudder, I knew at once that my tail wheel springs were too weak. I did get back on the center of the runway



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and advanced the throttle all the way and made a normal take off, kept the nose down and let her climb away. What a feeling and experience to fly your own homebuilt! When I reached pattern altitude and relaxed somewhat I looked at the instruments, and everything was fine but the airspeed. It was indicating 20 MPH. I tried not to be nervous because of the low airspeed reading and settle down, pay attention to where the nose was, the wings, and the feel of the controls.

The first flight duration was about twenty minutes. I did get in the air, now was the time to land. I am even with the numbers, carb. heat on, pulled the power, made base, on final for 9,000 foot runway and I was short (biplanes sink faster) so I applied some power and I was over the concrete, power back, stick back, hold, I made my first landing, which was a greaser. All my landings since were not like the first one, but I am working on it.

I think the V-Star is a nice easy machine to fly, even for low-time taildragger experienced pilots like myself. Joe Mason flew the V-Star when I had about six hours on it and his comment was,

"It is a very nice machine." Fitz Fulton from NASA had taken his turn with ten hours on it, his comment being "Outstanding." I am very happy the way the project turned out.

I do not have very much performance data to talk about yet. Climb is 750 FPM, and 2,000 RPM will produce 80 - 90 indicated, on final I like to keep it 65.

To look back on the project today, I must say it was worth all the struggle. To build and fly your own airplane in this country can be accomplished without any red tape at all. I think we should be thankful we can live in a country where some of our dreams can still come true.

Sincerely yours,

P.S. If I can be of any help to other builders, do not hesitate to contact me.

DANNY SANDERS
HERANT ENGINEERING COMPANY
7123 CANOGA AVE
CANOGA PARK, CALIFORNIA
91303

DIANE ABRAMSON, A & I MECHANIC FOR FLYING TIGER AIRLINES AND ACRODUSTER TOO BUILDER, WAS RECENTLY INVITED TO BE ONE OF SIX MEMBERS OF A PANEL ON "WOMEN IN AEROSPACE" AT THE NATIONAL CONGRESS ON AEROSPACE EDUCATION, IN ATLANTA, GEORGIA. SHE ACHIEVED THIS HONOR BECAUSE SHE IS ACTIVE IN AIRCRAFT MAINTENANCE AND BUILDING HER OWN AIRPLANE. CONGRATULATIONS, DIANE.



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Jim,

Sorry I've been so long in writing but you know how things keep piling up. But now I've finished my V-Star and have flown it approximately 30 hours and everything works just fine except that it only climbs 1000 FPM on a hot day. I'll give you some specs. and see if you can answer some questions for me.

I'm using a O-235-C lycoming with a 74" x 49" prop. It grosses out at 1240# the cruise is about 105mph and climbs about 1000 FPM.

What is the biggest engine that can be used on this plane? Also, what is the new load factor and what is the never exceed speed? Remember I used the 2,3012 airfoil with 4 ailerons and constructed the wings from Stardusted Too prints completely. The rib stitching is for 230mph. All of the fittings are .125 chromoly plate. The empty weight is 889# with battery, starter, generator, strobe and position lights and radio. All control responses are great but I'd like to climb a little better. Hope you can answer some of my questions. I've only had it to two meets and have won best in its class at both.

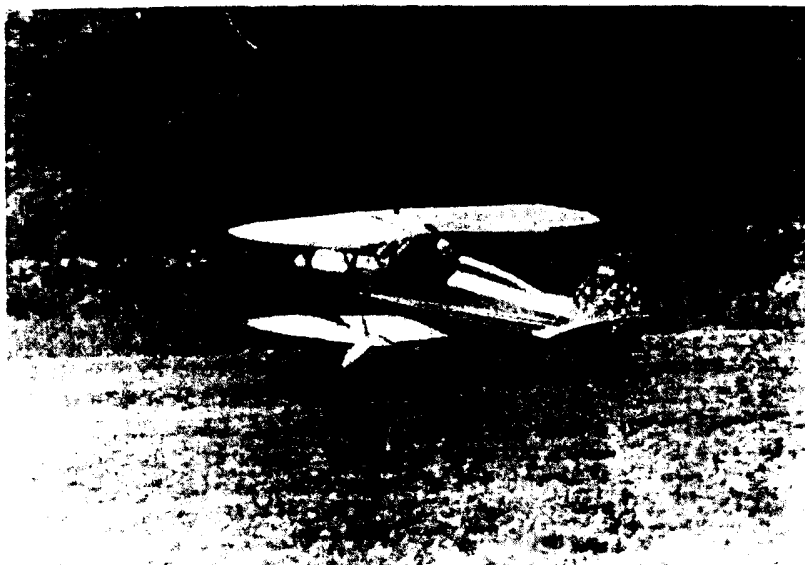
Hoping to hear from you soon,

Pat Logsdon
Box 622 Calla Hill
Mt. Savage, MD 21545

Pat,

I am sure you can stuff a 10320 lyc. in your "V-STAR" . I would check the C.G. envelope carefully first, you still should be with in +9 - 9 G load range, especially with the .125 root fittings. You may investigate Prop pitch for better climb? Congrats on your very nice "V-Star".

Bill



steering of the tail wheel. We also used this time to finish up details of the instrument panel, cockpit, cowl and wing rigging. We found that the rudder horn connected through springs to the tail wheel was too high above the tailwheel horns to get positive steering. We altered the horns on the rudder to correct the problem.

We then started full taxi tests to check alignment of the wheels and effectiveness of the brakes at higher speeds. Also, we could check the rudder and elevator effectiveness to lift the tail and steer with the rudder and then chop the power and steer with the tailwheel as would have to be done for a landing. Everything worked fine as long as we gingerly kept two feet on the rudder pedals when using the tailwheel to steer. The short coupling between main wheels and tailwheel didn't allow ferreously rudder corrections to keep the airplane going straight at touch down speed.

The next step was to do short liftoffs from the runway to prove that rigging and balance of the airplane was acceptable. Neither Bill nor I had built an airplane before, much less rigged a two-winger. We wanted to find out if there were going to be any problems with lateral or longitudinal balance or stability.

The grass runway we were using (3000 feet) allowed us to progress from barely getting the wheels off the ground to climbing and leveling off at 10 feet or so before cutting the power and landing. Happy the airplane took off and flew almost hands off. We also noticed the airspeed indicator might be indicating high. Since the instrument was vented to the cockpit, we suspected the cockpit air pressure might be lower than undisturbed ambient pressure.

Those were very happy and satisfying days. After years of welding, woodworking, fabric working, metal working, painting, adjusting, etc., we were starting to enjoy the fruits of our labor. But the acid test was still to come, the first flight.

Planning of the first flight was always in the back of our minds, but as the lift off tests were in progress, it came very much to the fore. We re-inspected everything we could see. We planned the best responses to every possible problem we could think of, covering everything around the pattern from take-off to landing, including control problems, engine problems or airframe problems.

The first flight became my honor — I drew the short straw. I planned what I would do in each segment of the pattern in case of trouble. I went over it in my mind until I felt I had every base covered. We agreed that both of us must agree. It was time for the first flight. We also agreed there would be no negotiations given. We wanted no pressure to meet a schedule or do something during the flight.



Side profile of V-Star reveals pleasing lines, so typical of Lou Stolp designs. Note registration N15GM on fin and very essential moving handle on lower fuselage, just forward of the tail.

foolish in order to not disappoint an audience.

The east breeze favored runway 8, which was a paved runway. As I taxied on the east-west taxiway, I felt proud as punch. We had come a long way and everything was looking good. As I performed the final run-up before the first flight, I think I watched the RMP drops on the dual ignition closer than ever before. The adrenalin started to flow in spite of the fact that Bill and I had done everything we could think of during the previous tests and preparation, this was going to be the moment of truth.

I did a 360 degree pivot turn before pulling out on the runway. I didn't want any other airplane in the pattern, if possible, for this first flight. I wanted full freedom to take any action I needed if something went wrong. The pattern was clear. As I opened the throttle, my heart beat faster and faster. I listened for any hint of engine trouble like I had never listened before. It ran smooth as velvet. The airplane lifted off perfectly. I had only a few seconds to decide if I should chop the throttle and still be able to land straight ahead on the runway or be committed to fly the pattern. I was surprised at the strength of the temptation to chop the throttle. There was no hint of trouble though, so I decided to keep going.

As I approached the end of the runway, where there was the least opportunity to make a safe forced landing, my heart was pounding. The engine sounded good. The V-Star responded perfectly to the controls. I stayed close-in to the runway on the crosswind and downwind legs. I climbed to 800' AGL for downwind and the adrenalin and heart beat started to ease off a bit. The view and fresh air were beautiful, but I

wasn't able to relax and enjoy it. I was more interested in the sound of the engine and the effectiveness of the controls.

I then realized there was heat pouring into the cockpit between the firewall and the aluminum side panels past my legs. It was very noticeable. We hadn't noticed it during previous liftoffs. Was there trouble in the engine compartment?

It is at a time like this that a thought goes through your mind like, "What am I doing this for? The good Lord must know, but He isn't telling." As I turned from downwind to base leg, the excellent visibility in all directions from the V-Star allowed me to notice a thin trail of smoke behind the airplane, marking my path around the turn.

My heart was in my mouth. On the first flight I was going to have to deal with one of the worst problems a pilot can have. I throttled back, dropped the nose and angled toward the end of the runway to minimize the distance and time to land. The heat from the engine compartment coming around the firewall seemed to increase. With the airplane's built-in drag of the many struts, braces and wires, there was little problem of picking up too much speed. Again, a thought went through my mind, "Berry, you crazy idiot, what are you doing up here?"

I could see no flames. I was afraid there was a fire in the engine compartment but was praying that there wasn't. The seconds that it took to get to the runway seemed like hours. I wanted to get out of that airplane as fast as I could. I managed, however, to keep rational and realize that making a good landing was the first order of business. Getting out of the airplane would have to come later.



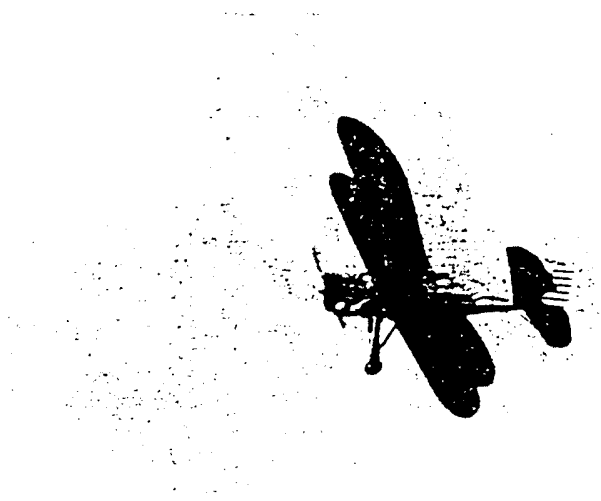
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The experience of the many takeoffs and landings came in very helpful now. I knew exactly what the landing attitude looked like from the cockpit, what the landing control pressures felt like and what rudder pressures I would have to use in order to steer after touch down. That was a big comfort. It made it easier to plan ahead. I had no difficulty making a good landing. I then applied brakes, swung off the runway while popping the buckle on my seatbelt/shoulder harness, turned off the fuel valve and mags and extricated myself from the plane in less time than ever before or after.

As I stepped off the right wing to the ground, next to the cockpit, I could see no smoke coming from the engine. Looking into the engine compartment through the back opening of the right side cowl cheek, I could see no fire at all. What was the problem?

By this time Bill had arrived with a fire extinguisher bottle and verified he had seen the trail of smoke, too. On opening the cowl, we confirmed there was no fire. After a little inspection effort, the mystery was solved. Oil from a rocker box cover was dripping on the exhaust manifold. The oil apparently had not been at operating pressure long enough during the previous lift offs to leak out in sufficient amounts to drip. Needless to say, we checked all the rocker box covers for tightness before the next flight!



Rounded "Butterfly" wings with curved trailing edges are Lou Stolp's trademark. V-Star evolved from earlier Starduster I and Starduster Too designs.

While our preparation was, in our minds, quite thorough, something still managed to slip through. Fortunately it did not lead to tragedy or even an accident. The conclusion I drew from this experience is that there just cannot be too much thoroughness for that first test flight. That includes the pilot as well as the airplane.

Many previous hours of experience taught me to fly an airplane one step at a time. It kept me from trying to hurry the landing. Otherwise, there might

have been an accident or even a tragedy, simply because I thought there was an emergency. No matter how well you preflight the airplane or pilot, you cannot be 100% certain you haven't missed something. I would recommend that you talk to someone who has done it before. Then plan as thoroughly as you can and have your options clearly in mind for each eventuality.

I don't suppose it would hurt if we treated each flight as though it was the first one.

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