

The *Starduster* Magazine

April 2000



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The *Starduster* Magazine

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Inside Back Cover

The Starduster Award Trophy, handcrafted by Hank Schmel over 15 years ago, has been on display for the last several years in the Oshkosh Air Museum. It is in the process of being recovered from the Museum and again activated as an annual award for the Champion Starduster at the Oshkosh/Wautoma fly-in.

This magazine uses material submitted by its readers. The articles printed do not necessarily represent the views or opinions of *The Stolp Starduster Corp.* or *The Starduster Magazine*. The Corporation and the Magazine assume no responsibility nor liability for the accuracy of the printed material.

**20th Annual
Starduster Open House**
Oroville Municipal Airport, California
(Tentative Schedule)

Friday, May 19, 2000

10:00 a.m.	Registration opens
11:00 a.m. - 1:00 p.m.	Sack lunches & beverages available
2:00 p.m.	Leave Airport for Houseboat Cruise
2:30 - 5:00 p.m.	Houseboat Cruise (incl. drinks & hors d'oeuvres)
5:30 p.m.	Social time, Oroville Airport
7:00 p.m.	BBQ Dinner, Oroville Airport

Saturday, May 20, 2000

5:45 a.m.	Briefing for Dawn patrol
6:00 a.m.	Depart for Willows for breakfast
8:00 - 10:00 a.m.	Pancake breakfast - Oroville Airport
10:00 - ?	Local flying, rides, and flights over Lake Oroville
11:00 a.m. - 1:00 p.m.	Starduster Factory Tour. Sack lunches & beverages available
12:00 p.m.	Oroville area tours available
5:30 p.m.	Social time, Oroville Airport
7:00 p.m.	Dinner & Awards, Oroville Airport

Sunday, May 21, 2000

8:00 - 11:00 a.m.	Pancake breakfast, Oroville Airport
8:00 - ?	Local flying & Departure

Please call directly for Hotel Reservations in advance:

Best Inn & Suites	800-626-1900; 530-533-9673; FAX 530-533-5862
Travelodge	800-578-7878; 530-533-7070 FAX 530-532-0402
Villa Court Motel (AAA)	530-533-3930
Motel 6	530-532-9400 FAX 530-534-7653
Days Inn	800-329-7466; 530-533-3297; FAX 530-533-4809

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President's Message

The best thing I can say is that we are coming up on spring time. Get ready for lots of flying. The weather has been strange this year but spring, summer and fall should be great.

The grass has turned green here in California and the waterfalls around Table Mountain are running full tilt. Gas prices have jumped skyward, hope they come down soon.

We have finally hired a full time welder/fabricator and are getting caught up on back orders. We

will start building stock in the next week or so. New flyers and catalogs specifically directed at each specific aircraft are under way. By Open House time in May we should have some good things to present.

We are looking for pictures of Starduster Too's, Acroduster Too's, Starlets and V-Stars. Pictures of projects under construction are also needed. Hope to see you at the open house. Safe and happy flying.
Les Homan

Correspondence

Clay Dec. 20, 1999

To say that I have been a bit remiss in my promised communication to you is a slight understatement. However, better late and all that sort of thing. I have just finished weighing my Starduster (1080 lbs) and will be pulling it all apart again to start covering it. I decided this summer to use the "Stits" process on this one since I have seen some pretty nice jobs done with it. My cowlings are available should anyone want one. I would like to thank Hap Schnase and Jim Wright for helping me out on my trip back up to WA after the May fly-in, and the Starduster guys for letting me use their shop. This is the end of my communicative skills for the year.

Lou Hagler, Langley, WA (See Photo, p.19)

Clay Jan. 13, 2000

Reference your note of the 11th, the following additional information is submitted re "The Starduster On The Glacier." Bob and I found the snow well packed on the glacier for landing, as many Cessna 185 aircraft on wheel skis had preceded us, which packed the snow down very well. We landed uphill (actually a very slight slope) and took off down hill. The "runway" was marked by big orange plastic barrels which helped greatly with depth perception. The outside air temp was about 45 degrees with no wind, and the Base Camp altitude of about 6000 feet presented no problems

for my Stolp Starduster!

Hope to see you and Glen at Oroville this year, although I don't know the date as yet. Lloyd Lambert in his Red Too is planning to fly up with Jeanne and me. My only conflict is another trip to Alaska (as a guide in a Cessna 182) which is scheduled to depart 15 May! Regards.

Oscar Bayer, Arroyo Grande, CA(See Photo, p.19)

Dear Ken, Jan. 21, 2000

Here are the pictures I promised you of my Starduster SA100. It was completed in 1994 and I purchased it last year. It has 120 hours total on it, of which I've put on 60 in the last year. I'm a retired USAF F-4 pilot and I think the airplane is an absolute joy to fly.

The airplane has an O-290 D-2 (140 HP), a lightweight Skytec starter, Stits covering with Aerothane, Scott tailwheel and Cleavelands, and full VFR instrumentation. It's not a Pitts, but is as aerobatic as the average sportsman pilot would want. I do wish the original builder had put in an inverted oil and fuel system. Maybe later.

Timothy D. Hudson, Greensboro, NC

(See Photo, p.20)

Gentlemen; Jan. 30, 2000

I recently received my long awaited January issue of the Starduster Magazine, which accomplished two major things: First, it lifted my spirit,

(nothing unusual 'bout that, it always does), and turned my thoughts toward Springtime and "Flying weather."

Second, it reminded me of a long overdue, self-imposed obligation . . . Sometime last August, growing weary of shooting touch-n-goes at my home base, Clark County Airport (JVY), and having developed a "been there/done that" attitude about the visits to all the local fields, I remembered an article in an earlier Starduster edition about a couple of fellows who owned a 'Duster on a grass strip near Evansville.

I blew the dust off the 'ol sectional, located Hepler Airport (43IN), fired up my Luscombe . . . (oops, forgot to tell you, I'm STILL a Duster "wannabe"! . . . headed West 'bout 100 miles, and was privileged to meet one of the most accommodating guys you'd ever hope to encounter. Even though he was on a tight schedule, about to take a friend for a ride, he said, "If you flew all the way here to see a 'Duster,' I'm gonna take you for a ride." . . . And what a ride it was . . . (I got to make a couple of 360's . . . Responsive?! . . . Let me tell you, those 'Dusters are dream machines . . . But you already know that, right?!!!) . . . So, a long overdue word of THANKS, Gene Glackman, you made my day!!!

To continue, I must say that I shouldn't be surprised by the pleasant reception displayed at Hepler Airport . . . every 'Duster pilot I've met has been willing to share their knowledge of their planes . . . Dave Baxter, Al Tomlinson, and many others are great ambassadors for your (hopefully, someday soon, OUR) Starduster Aircraft.

In closing, your January edition was the best yet! The input regarding landings was great! I am currently trying to teach my daughter and son-in-law how to land my Luscombe on the hard surface runway at Clark County and have employed many of the techniques your pilots mentioned . . . unfortunately, they began flying tricycle-gear Cessnas, so the transition is a challenge. Thanks for a great magazine . . . **DON'T CHANGE A THING!**

Respectfully,

Norris E. Garvey, Floyds Knobs, IN

Dear Clay,

We have been working virtually night and day on this Acroduster. I finished both of the wings, and dry-fitted them to the fuselage. Everything matched up perfectly except for the aft wing fitting on the upper left wing, so I will have to make a new one and re-drill the hole. Gary has finished the fuselage, and will be painting it today. I'm out in California doing my AF Reserve duty, so I'm no help to him. When I get home next week sometime, I'll start covering the wings. I've never done any dope and fabric work, so it will be a learning experience for me.

Along with the story I wrote, I'm enclosing a picture of the Acroduster in our garage with the wings on. It's really looking good, Clay!
C5Babe, Lakeville, MN (See photo, page.20)

Gentlemen,

The spades on my Starduster are very effective. As a matter of fact, all of my friends that have flown it with me say that they'd cut them down a little bit because they are too effective. They are lighter while flying than just sitting on the ground. Seriously—I can tap the control stick, and I emphasize TAP, and the stick goes from center to full deflection and then nearly all the way to opposite deflection. It is like having major power steering. I have a Pitts S1-Calso that only weighs 596 pounds and the Pitts has heavier controls than the Starduster by a long shot.

Another thing, when it is windy or gusty, the spades do rock the plane more. As a matter of fact, it makes it rock both ways, because the wind hits both spades. You just have to learn not to compensate for the wind because it will correct itself, first rocking one way then the other way. If the spades were smaller it would be just as effective and probably not so annoying to some people. I like them the way they are because I like to do simple aerobatics in it, and there is no strain at all—(what a long story I made this).

I have seen other Pitts that have spades just like these, so I'm sure you can buy them. I bought this Duster with these on it so I know nothing about them. I will try to take some pictures on Sunday while I'm at the airport. I can have a friend of mine scan them and e-mail them to you if you'd

like. Let me know for sure, or I won't go thru the hassle because he lives 50 miles from me. I don't know of anyone near me that has a scanner.

Soooo..... let me know by Saturday night so we can plan for it. I'll have to have the pictures developed also, so give me a few days.

Greg Mayotte, Gresam, OR

Hi Folks,

Feb. 11, 2000

Believe it or not, I just sent in a roll of film to be developed that I've had in my camera since last September. Look what I shot at the Heber Valley Fly-in!! Two Stardusters! Can you believe it? The Starduster in the foreground belongs to Grant Cuning, from Ogden, Utah. (Grant and wife, Adelle, flew to Oshkosh last year with Clay and me, Mike Gustafson, and Don Mortensen and Bob Barrett). The Starduster in the background belongs to Bry Anderson, from Heber. (Bry built this airplane, finishing it in 1997.)

Left to right in the picture is Bry Anderson, myself and Liberty Lloyd. Liberty, with his brother Orville, designed and built the beautiful Liberty Sport biplane. This one-of-a-kind design was so popular that a model airplane company copied the design and sold many thousands of units. Liberty was a B-17 pilot during WWII.

(I'm not going to mention that I received the first place trophy at Heber for my Acroduster.)
Glen Olsen, Salt Lake City, UT (See Photo, p.21)

Dear Clay,

Feb. 21, 2000

Thanks for answering my letter. Sorry that I didn't respond earlier, but my server went down and I couldn't access my mail.

I would be very happy if you could publish my article in your magazine. I can send you by regular airmail color photos of the pages of the magazine, or the magazine itself. If you wanted the magazine, you would have to return it as it is the only copy that I have. In either case, I could also send some original photos and the text of the article. Please tell me which you prefer.

I don't remember having seen the article on

wing alignment in the Magazine, and since I'm not now at home I can't verify that I have the issue, but I'll look and confirm whether or not I have that issue.

With respect to your vacation in Germany, it would be great if you could fly to Madrid in the Cessna 172 (I also have a 172). It's really easy to fly to Madrid from Germany. If you can't make a direct flight, you can make a stop in southern France, and then come directly to Madrid.

In Madrid, in addition to the principal airport (Barajas), there is another smaller airport called (Cuatro Vientos (LECU), from which we operate all the private planes without any problem. (The tower is operated in both Spanish and English). I would be there for anything that you might need.

Let's keep in touch. Best regards,

Angel Jimenez Martin, Madrid, Spain

Dear Ken,

Per our telecom, I am enclosing a picture of my recently completed V-Star. It is powered by a 140 HP O-290 with inverted oil and fuel. Carburation is an Ellison Throttle Body.

The following changes were made from original design:

1. Added ailerons to top wings.
2. Shortened ailerons in bottom wings.
3. Changed incidence of top wings from +2.5° to +1.5°.
4. Incorporated a portion of vertical fin into rudder similar to the Starlet.
5. Installed controllable trim tab in elevator.
6. Added steel back-up plates to flying and landing wire aluminum attach plates (after-thought).
7. Routed rudder cables outside fuselage frame via pulleys.
8. Added landing wire to aft spar (lower wings).
9. Installed engine "straight ahead."
10. Fabricated different style cowling.

Construction time: 4 years. Will probably put airplane up for sale or trade for something more suitable to my age group after I have flown it awhile. Sincerely,

Bill Boyd, Waco, TX

(See Photo p.21)

A Salute To Dave Baxter

by Hap Schnase, Scappoose, Oregon

A short time ago while looking at a newly formed crack and lower tube failure in my bungee truss, I realized the rebuild was going to be much greater of a job than my time and talent allowed. I talked to several flying and builder friends who all agreed this was truly going to be a challenge due to the fact that the proper fix involved cutting both tubing clusters and gear lugs out while the engine stayed on, (you don't know my engine).

This is where real friends come in. A call was made to Mr. Starduster himself, Dave Baxter, who just happened to be traveling to Oregon from his home in California to visit family for a quiet and non-work Christmas vacation. For those who know Dave, I'm sure you have guessed by now what took place.

Five long days later, besides lingering flu symptoms and an eye infection which required a doctor visit, my Starduster now has a new heavier duty truss and surrounding fittings all in perfect alignment in spite of the motor staying on.

Now I knew Dave was a miracle worker and rebuilding broken up spray planes for a living probably doesn't hurt, but the many skills and talents this man has is just unreal. I don't know anyone who has helped spread the joy of flight and ownership, transitional help on flying and all around excellent advice on owning and maintenance on the best biplane in the world than this man. It would only be right to give Donna the thanks she deserves for allowing Dave to devote so much time to others. Dave told me about my plane, N26AH, five years ago and went with me to California to inspect and fly the plane home. I have many hours on the plane and enjoy it as much if not better than the day I bought it. I would suggest to anyone, especially those who have a plane with a larger and heavier engine than an O-360, to inspect the truss area, as the original plane was not designed for the extra weight of six cylinder engines and sometimes not too proud of landings. Again Dave, I want to thank you for all you have done for me and all the Starduster friends.

Starduster Award Trophy

by Hank Schmel

Almost sixteen years ago "The Prez" B.C. commissioned my friend and I to make an award trophy that would be different.

The award was to be called "THE JOE RUDY MEMORIAL TROPHY." The award was to go to the Grand Champion Starduster at the annual Oshkosh open house—the name of each Grand Champion to be engraved on a gold plate and permanently installed on the trophy. Well, it's been sitting in the corner not being used and I'll tell you, I'm a little bent about it. I think once you have seen it, once you have held it, you will love it. The picture doesn't do it justice.

I would like to get it back to rejuvenate the wood and polish the rest of it. This trophy stands about 30 inches high with a base that's 20" X 18".

It's made of solid black walnut and aluminum. Starduster paid for the walnut, with the remainder of the material and labor donated by my friend Rick Pothers and myself. Replacement costs today would run about \$1500.00.

Joe Rudy had the 1st Starduster with a round engine. He was at the Oshkosh E.A.A. Open House, I think the year was 1982. Anyway, he was giving a ride to an 18 year old young lady— her first ride ever in a plane. During the flight another plane made contact with the Starduster. Joe was unable to control his craft and went down in Steve Witman's backyard. Needless to say, both he and his youthful passenger did not survive.

(See trophy photo inside back cover)

This Is My Story and I'm Sticking to It!

By Chris DeBaun, Lakeview, Minnesota

I met Gary when I was just sixteen. At 22 he was the proverbial "older man" and a sergeant in the Air Force. He was a grease-stained fellow with a worn copy of Ernest K. Gann's "The High and The Mighty" crammed in his hip pocket. He whipped it out to write my phone number inside the back cover. I had been born and raised in the Panama Canal Zone, and dating an older GI was not on my parents list of approved activities for their daughter. My brother, though, saved the day. He knew Gary as a fellow member of the Albrook Aero Club, and vouched for his good character. So, with trepidation, my father allowed us to date. We usually went to the beach, but on pay-days, Gary would rent a Cessna 150 Aerobat, and we would fly up the coast of Panama, or out to Contadora Island for a day in the sun. His logbook annotations show doing T&G's at Gamboa, and K&G's with Chrissy.

We married when I was 19, and we moved to Ellsworth AFB in South Dakota. Those early years were hard, but fun. Gary worked for B&L Aviation at the Rapid City Airport during the day, and for the Air Force from 3 to 11 PM. Money was non-existent, but B&L let us fly their airplanes for the cost of the gas, and for our honeymoon, we went to Oshkosh. Gary forgot the tent poles, so we had to sling the tent over the horizontal stabilizer of our Beech Musketeer, and we would lie inside and watch all the airplanes flying. That week, that wonderful week, we fell in love again—with airplanes. To this day, watching the Ford Tri-motor fly makes me cry because it is so rare and beautiful.

And so the scheming began: how to get our hands on our own airplane. We got a lead on a J-3 Cub in a garage in North Dakota. Complete with engine, it just needed to be put together, and the owner wanted only \$1100. Can you believe the bank said "NO"? Back then, debts were high, and the Air Force didn't pay their Staff Sergeants a whole heck of a lot. So, back to the drawing board. At B&L Aviation, where Gary worked, back in the corner of an old hanger, covered with dirt, rust, and dust, was a "project." Murl, Gary's boss, sold it to Gary for \$400. We ate Hamburger Helper for a year to pay for it. The "project" was a welded

fuselage of a Smith Miniplane, and a set of plans.

I must say, I didn't think it could be done, but I was a newlywed. I did not yet know my husband. It took seven years. In those seven years, I had a baby girl, joined the Air Force myself, spent three years in the Philippines, and watched Gary struggle to finish what eventually became a "wanna-be Acroduster."

You see, around year two of the construction, we discovered FlaBob airport, Stolp Starduster Corporation, Jim Osborn, Eric Schilling, Glen Beetz, Bill Clouse, and the rest of the characters who populated the place. We had been transferred to Norton AFB in San Bernardino, California, and went to check out the local airports. FlaBob was great. It looked like a time warp had descended on a 1930's era airport, and transported it, airplanes and all into the 70's. Walking down the hangar row, you were as likely to see the Red Baron's Tri-plane as a Cessna. And in the midst of it all, were Acrodusters! Big, beautiful Acrodusters!

Poor Gary. He started building a Smith Miniplane, and after discovering FlaBob, tried to turn it into an Acroduster. He hung around Stolp too much. Glen Beetz put up with him, answered his questions and gave sage advise. To this day, Gary swears he saw Glen weld together a piece of paper and a hunk of steel, then watched it fly off, in formation with a kite.

But I digress. Gary's Acroduster was still a Smith Miniplane. And eventually, (seven years, remember?) he finished it. And he flew it. And he had loads of fun in it. He even flew some Sportsman level aerobatics in it, and did very well. But it wasn't an Acroduster.

And where was I while Gary was having all this fun? Me! Gary's Wife! His sweet-tempered, beautiful, loving, devoted, beautiful, supportive and flat-out wonderful example of beautiful American womanhood. Wife??? I was on the ground looking up. That's where. A Miniplane has only one seat-one cockpit, and since I'm pretty much a dedicated passenger, that leaves no room for poor lil' ol' me. But hey! Gary was having fun! For the next 10 years or so, Gary had over 1000 hours of fun. I was looking up.

Now to be fair, I was having my own share of

fun. When I first entered the Air Force, I was a Security Police Narcotic Dog Handler. For six years on active duty, I trained and handled viscous, long-toothed dogs. Then for another three years I was a regular Security Police patrol cop in the Reserves. In 1984, I decided I needed a change, so I cross-trained as a Loadmaster on the giant C-5 cargo airplane, and in doing so, found my niche in life. I got to see some weird cargo, meet some great people, and go to the neatest places on earth. It's like getting paid to go on vacations all the time. I love it! So, I guess I've been having fun, too.

Twelve years ago, Gary retired from the Air Force, and with discharge papers in hand, he got his dream job as a mechanic with Northwest Airlines. We had to move from California to Minnesota, and it didn't take long to realize that because of the harsh winters here, the Miniplane just wasn't as much fun anymore. I think he was also starting to feel a little guilty about leaving me out of the airplane fun all those years. So, with much sadness, Gary sold his beloved Miniplane. It still plies the skies somewhere down in Indiana. Since then, we've bought and sold a Champ, bought a Chief to restore (not done yet!) and fly a Cessna 170-B we've had for 8 years. But still, Gary hankered after his open cockpit Acroduster.

Last year was a hot one at Oshkosh. We've attended almost every year since moving to Lakeville, camping out under the wing of our airplane in Showplane Camping. It's always hot, but '99 was especially miserable. We had already been there 5 days, watching the build-up to Opening day. Early on the morning before opening, the temperature was already approaching 100 degrees, and Gary and I decided to walk up to the Fly Market to look through the fence. Maybe we could spot a bargain.

As we rounded the corner of the warehouse, we spotted a flash of red and white. I heard Gary mutter "Holy S---!", under his breath as he moved closer for a better look. There, sitting in the yard, in many pieces, was a broken Acroduster Too. It's wings were damaged, it's right landing gear was folded up, and it's engine was missing. Faded lettering on it's tail proclaimed it the Prototype Acroduster Too. As we stood there, outside the fence, I could see the little wheels inside Gary's head start to turn: ACRODUSTER! But I knew that we probably wouldn't be able to afford it.

The Fly Market employees were rushing around preparing for opening the next morning, and one of them came over and attached the price tag to an "I" strut. "Can you see this O. K.?", he asked. Not only could I see it just fine, I could also see Gary start to hyperventilate. \$2000! That was all: \$2000. Well, guess what? At that very moment, we had \$2000 in cash in the bottom of Gary's backpack. I had saved six hundred dollars in pocket change in the past year, and Gary had put away some of his overtime pay, and we were going to buy a nice GPS for the Cessna. But, ya know, Gary gets this poor little lost puppy dog look in his eyes that even after 26 years of marriage, I just can't resist.

"Who's the seller?," I asked. "Oh, he's over in the Wentworth booth over there." the clerk replied, nodding his head in the direction of the huge warehouse. Inside, it was cool and dark, giving relief from the bright sun. The Wentworth booth was just inside the door, and I recognized two of the guys behind the counter. I had bought parts for my Cessna at their buisness in Minneapolis before. Ken said that they hadn't yet signed the consignment agreement with the Fly Market, so if I wanted the Acro, it was mine.

Quickly, the \$2000 went from my pocket to his, and a sales receipt went from Ken's pad to my pocket. After 24 years of yearning, Gary and I were the owners of an Acroduster Too! A little bent, a little broke, a little worse for the wear, but an Acroduster. This time, we stood inside the fence to admire the little airplane. The flying wires were taped together in a bundle, and I decided to take them with me so they wouldn't dissappear and I removed the price tag and put a "SOLD" sign in its place.

A group of admirers had gathered outside of the fence. One man asked me if I owned the Acro, and when I said "Yes," he offered me twice what I paid for it. I couldn't believe it. I had owned it for ten whole minutes, and already I was getting offers on it. By the time I loaded it on a trailer and hauled it home to Lakeville two days later, I received at least ten offers to "Make a tidy profit" on it. Trust me: It would have taken enough money to buy a new Acro to make me part with this. This one was special: it was built by Morgan Schrank in 1971 and had serial number 1 engraved on its data plate.

And so the process began. Gary is an A&P/AI, and having built the Miniplane, he knows what he's doing. He has a cute tush, too, if you care to look. I, on the other hand have no licenses, mechanical or otherwise. But, over the last ten years or so, I've turned into a not-half-bad carpenter. I've built bookcases, beds, tables, chairs, dressers, cabinets and various nik-naks.

I knew I could fix the wings, and I did. With no plans, just copying what was there, I completely rebuilt the upper left and lower right wings. I built new ribs, false noses and wing tip bows, as well as three new spars. And I replaced all the leading edge tin with formed plywood. I figure it took me about three weeks per wing, in between times flying for the Air Force. Gary stripped the fuselage down to bare metal, and I sand-blasted it to clean off all the old paint and surface rust. There were no cracks in the welds and no damage anywhere else. After priming, a coat of Pontiac Red made it look like a brand new fuselage.

I took the gear and engine mount out to the Starduster Factory in Oroville, California to be fixed in their jigs. Those guys are the best. Ken

always has time to answer my dumb questions, and then chat on the phone a while. When I show up in person, he lets me wander the shop, inhaling the smell of the airplanes. Thanks, Ken. You're a prince among men.

Gary has done a phenomenal job getting the Acro back together. Everything he's done on it is beautiful. He completely rewired everything, and it all works perfectly. We bought an IO-360 to put behind the propeller, and we started it up on Halloween morning. Except for a small oil leak, it ran perfectly.

It's sitting in the garage right now. All four wings are on it to test fit before covering them. From where I sit right now, I can see the right wings. We spent all weekend putting them on, testing the fit, adjusting the wires, enlarging the holes here and there, and yes, patting ourselves on the back every now and then. We will be at Oshkosh again this year. We will be camped out behind the wing of our Acroduster Too in the Showplane Camping area. In the morning, Gary will get up early and go fly. And now, I can look down instead of up, because I'll be Co-pilot.

Forever Young

by Verne Reynolds, Mt. Vernon, Washington

1923. What a great year to be born! A sight-seeing hop in a Jenny would set you back two dollars. The Charleston was the name of a dance, not just a city anymore. Lucky Lindy hadn't begun to think of Paris, yet. Los Angeles didn't know of smog; Henry Ford thought black was a really great color for all his cars, and the market was destined to go higher ... for a while. It was a time when the future teased and enticed us.

Even now, on a quiet night, if you listen carefully, you may still hear a soft echo of the twenties, a wisp of flirting laughter and the tinkle of some nearly forgotten piano. An echo that shimmers with black beaded dresses cut high above the knee ... close cropped boyish bobs swept up tight against the cheek ... spots of rouge, and garters, and a hint of bathtub gin. But the echoes and the memories are fogged, like a mirror caught in steam.

When the children of the twenties were young, a surge of them flocked to our airfields, determined

they would team to outfly their German heritage, and cleanse the Pacific of its threat. I was one of them, and in the smudge of memory I still see me standing there, a gawking silhouette, watching those magnificent patient Stearmans cough, and float, and dance at landing time in a slow, wing-bending pirouette. In the smudge, still I feel the jolt of an inverted seat belt while my toes stretch for rudder pedals. And I recall the magic of helmet and goggles and parachutes, and how we ached to tell our girl friends how wonderfully we flew.

Then the war ended. We picked up the pieces of our lives and went on to search for patterns, for fulfillment. I chased my own identity through a quarter century of trial and error, shackled to the earth, estranged from the ecstasy of flight. Then, one day, above the pastures and the concrete ribbons, again I flew. With comfort, with cabin heat and yokes and flaps and buttons, I flew. The joy of earth and sky and the silver lace of clouds were

there again, but somewhere in the smudge, I kept remembering an open cockpit, where the wind whipped crisp and cold against my cheek. It beckoned me and tugged at me. And then it happened.

A Starduster! Starduster Too! A two place open cockpit biplane! In the hangar, waiting to be bought, with only a few hours on the airframe and engine. It seduced my imagination. I yearned for that open cockpit! I could ill afford the asking price, but I wanted it. I was falling in love, yet I hoped some things could be changed. I wanted cockpit lines recut, a cleaner shape for cowl and leggings, a new paint scheme, a new N number to satisfy my special whim. So, through metalwork, and paint, and registration, Starduster Too, N1923S, 23 Skidoo ... was born, tangled with the echoes and the memories of Rudy Valley, Jack Armstrong, Kay Kayser, the N3N, Glenn Miller.

As ink dried on my payment check and Skidoo rolled from its hanger for that first check-out flight, I knew afresh the coupling of a buyer's remorse and owner's joy. Anxiety time. But time to fly.

In anticipation of this moment, I had recent flights in a Citabria, the only way I could build taildragger time again. I was to learn, quickly, in retrospect, that Citabrias and Stardusters have too little in common to be of much help. But now, with me strapped down tight in the rear cockpit, with my well-meaning mentor occupying the front ... the time had come.

Too inexperienced to estimate what problems might follow, too rusty with prop pitch and manifold pressure readings, with too much pressure to solo from a narrow downhill runway in quiet air with 100 degree temperatures, too low in the cockpit to see effectively, too insecure to insist on better conditions, with too much anxiety, and hope, and fear, and smudge, I started the engine and began my checkout flight.

My mentor/instructor/checkout pilot had a Starduster of his own. Experienced. He knew Skidoo, had flown most of its lifetime hours, but was casually unprepared for what happened on our second landing, when both tailsprings flew off during the bounce and roll out. Sitting there in the back, I wasn't sure of anything except I had lost control. I had no rudder control, no control of the tail wheel. My mentor waited for me to make corrections ... I waited for him to take over ... we both

thought the other person would work us out of the instant mess we were in. My plea for help couldn't be heard above the engine noise ... we were curving harshly toward a ditch on the left side of the runway ... I stomped right rudder again ... *nothing worked!!* I was sitting too far back in the cockpit to reach full rudder and brake ... I was in mid-panic when my checkout pilot finally slammed on the brakes just as we left the runway and hit the gravelled edge. We skidded sideways to a stop.

Now we were almost entirely off the runway, but with enough aircraft still encroaching to be a hazard to other landing traffic. My mentor aggressively tried, with full power, to twist and maneuver the Duster back on to the runway, but his abrasive efforts blew a tire, split the wheel fairing, splintered the legging, broke the tailwheel brace. I clambered from the rear cockpit to inspect the damage. I anguished. My dream was shattered. Skidoo was broken. And I wasn't sure what had gone wrong, or what I could have done to keep it from happening. I ached with helpless impotence. I had failed, and I was afraid.

We walked back up the runway, and there, on either side of the centerline, were the two tail-springs that had not been securely fastened. The cause of the failure was now more clear, but it left me burdened with remorse.

More time. More money. More remorse. But then, finally, the last bolt was tightened. My mentor flew 1923S to Santa Monica to meet me there, and I put Skidoo in the hangar for a time of celebration. The bird was home, in the nest, at last.

I rebuilt the seat cushions so I could see better. I rebuilt the seat back so I could reach the rudder pedals and brakes better. I taxied Skidoo around the airport until I felt I understood the ground handling characteristics better. I couldn't delay the check-out flight much longer, so I hired an ancient, confident, and crinkled instructor who had thousands of hours in biplanes. We flew. We flew the pattern for an hour, and then he tied his seat belt and shoulder straps together, threw me a crinkled smile, and in spite of my earnest protests ... walked away. I was on my own.

I taxied Skidoo to the end of the strip, wiped my sweaty palms against my nervous thighs, and waited for tower clearance. Maybe I should taxi back to the hangar. Maybe I could say the wind changed, or the aileron felt loose, or I had devel-

oped an instant cramp in my big toe, or that I had a strange ringing in my ear.

Dumb. I had waited too long. Now I had to go. I lined up with the centerline, asked for some Divine Guidance (with no assurance I would get any), held the stick all the way forward and pushed the throttle for full power.

"Two three Sierra, cleared for take-off..." Steady with the nose now ... a little more right rudder ... hold it steady ... straight ahead ... that's it ... the tail is up! Oops ... not too much ... there ... back again ... and better ... now ... easy ... back on the stick ... and then the smudge was gone!! The ground fell away, and sky rushed between the runway and 23 Skidoo.

Alone ... just the two of us ... slashing our way upward with each propeller bite through the haze of Los Angeles, gaining altitude. Drop the nose now ... hold it ... 85 ... that's good ... crosswind turn already? Bank it ... hold it steady ... keep the climb ... and now downwind at pattern altitude. Ease back on the throttle now ... back some more ... that's about right ... 18 inches of manifold pressure, 100 miles an hour ... downwind and opposite the tower.

"Two three Sierra, number 3 to land..." Number three? Gawd! What if I miss the airport? What if I can't find the other traffic? I didn't see any other traffic! What if I come in too high, too low, too fast, too slow? What if I land crooked? What if I ground loop? What if I bend a wing or break a wheel? Maybe ... maybe, if I just keep on flying straight ahead, downwind, and never return, I'll never have to land, never have to know. But there's my traffic, well set up on final, time for me to turn for base leg. Ease off the throttle ... bank ... keep the nose down ... not too slow ... that's it ... stabilize at 90 ... just a bit. The base looks good ... now bank again, and there's the runway, straight ahead. Whoa! Picking up too much speed! So raise the nose ... now the runway disappears! I know it's down there, somewhere, straight ahead, but flying from the back, that long cowl hides everything. Tip it over just a bit ... a gentle slip. Ah, there it is ... looks good! Just add a teensy bit more power

now, make sure we've got the numbers made. Looks good now, kill the throttle, round out the slip ... Ooops! Picked up too much speed! That's it ... that's the right height ... now ... flare! No! Too much stick! We're ballooning ... drop the nose again. Not too much ... now, flare ... hold it back ... you're still flaring high, Dummy, but it's settling. Hang on. Here it comes! Right now ... ! Now! Where's the ground?!! WHERE IS ... thrrrrrrump ... THAT'S IT! We're down! Now hold it steady, no ground loop ... keep the stick back ... Are we going straight? I CAN'T TELL! I CAN'T SEE! I can't tell if we're going parallel to that line over there ... or if we're angling toward it ... or away from it! Slow it up ... a little more brake ... good ... slower now ... slow enough, angle off between the lights ... not over them ... 10 miles an hour, 5 ... and a little more brake ... and now we've stopped

We did it! We just erased 27 years of smudge! The shiver in my kneecaps and my pounding pulse testify that the smudge is gone. We did it! We flew! We really did it! We made it work, *Skidoo!*

That tension-filled flight was the transition of prelude to pleasure. For years after that, N1923S filled my hungry soul with a tangle of anxiety and joy, of poetry and song. We teamed how to touch, as lovers touch, at first with hesitation, and then with exuberance. We chased the blur of our propeller through haze and sunlight, raced the wind past mountain tops, played leapfrog with the clouds, and looped and snapped and screamed down to chase old friends and innocent cattle and tipped and swung and held the world inverted on silver threads of music. Each time we were together, each time the wind was crisp and brushed my cheek, it swept away the smudge ... and I was young again. I was forever young.

All of that was long ago. "Skidoo was sold, repurchased, resold, wrecked, reborn, repainted, renumbered And N1923S was reassigned to my current Starduster, now lovingly kept in a hangar at Arlington, where the echo and the smudges are kept, as well. (See Photo, Front cover)

Where Do You Put Your Eyes When You Land a Starduster? Cont'.

Dear Glen and Clay,

Before I bought my first Duster I flew my niece's Citabria from the back seat, with her head in front so I couldn't see the instruments. That gave me a feel for seat-of-the-pants flying and landing an airplane from the back seat.

On downwind I don't make the whole pattern; what I do is start a big semicircle from the end of the runway so I can keep the runway in sight until final. On final I stay a little high so I can tip the nose down occasionally to see the runway and make sure I'm lined up straight. After crossing the threshold I reduce power to idle and float in for a 3 point, looking only out the left side to see the edge of the runway. If making a wheel landing I leave a little power in and after touchdown reduce it to idle. The Starduster is one of the nicest airplanes to land, if built right, but you have to stay ahead of the airplane and keep those feet busy on the rudder pedals.

Chuck Krabbenhoft, Sabin, MN

Hello Glen,

I am not much at writing letters but you asked, so I'll try. You asked me to give my technique for landing my Acroduster. Some background on my flight experience may help others in deciding how to best develop techniques of their own. I am an instrument rated private pilot with a little over 650 hours. All my time except for 35 hours are in tail-wheel type aircraft. Time in aircraft type includes Pitts S-1, S-2A, S-2B, Lazer, Acroport 2, Acroduster 1, and Too, Starduster 1, and Too.

Poor visibility in an aircraft is described as an aircraft that is hard to see out of for various reasons, these include low seating position, long aircraft noses, wide nose cowlings or any combination of the above. First let's talk about seating position. Seating position is very important in aircraft that have poor visibility. I know of many good aircraft that have been destroyed because of low seating position. In an aircraft that has a canopy I like to adjust my seat so that I have 2 to 3 fingers clearance between my headset (if you wear one) and the canopy, this gives plenty of room when you roll inverted. If the aircraft has no can-

opy I usually adjust the seat so that I can see reasonably well without getting beat to death by the wind.

Frequently I get asked where you look when taking off or landing an aircraft like these? My reply is usually, "You don't look, you see." By this I mean you don't focus on one spot. I place my head as far back as I can, let my eyes peer out over the nose and use my peripheral vision to see any nose movement. I find I can sense nose movement quicker this way than by looking at any one spot.

My landing approaches differ depending on the airport type, and how much traffic. On airports with not much traffic I start my approach at about 500 feet agl. Abeam the numbers I fly a gentle turn all the way until about 10 feet above the ground then I kick her straight (roll out of the turn) and proceed to land normally using the head back seeing technique described above. This lets you see the landing zone at all times during the approach.

Busier airports require a little different approach. Of course we have to fit in, so I fly the normal spamcan approach using a very slight slip, just enough to move the nose so you can see the traffic in front, and the landing area.

Crosswind landings do not seem to make much difference in aircraft such as the Acroduster because there is so much control power you generally won't run out of control. Occasionally on real strong crosswinds I will use 5 to 10 miles extra speed, but too much can cause problems in the flair as you will start to float across the runway before touchdown—always, always keeping the wing down into the crosswind. Approaches are flown at 1.3 times stall speed, except in strong winds. My Acroduster stalls at 70 mph indicated airspeed so I use 90 mph indicated for my approaches. These may not be the best procedures to use but they have worked well for me over the years. Have fun and happy flying.

W. David Spencer, Martinsville, VA

Glen,

Reference your January 22 inquiry, "Landing the Starduster," here is pretty much how I do it:

First— I prefer to fly a close-in pattern with a low power setting, keeping my airspeed down around 85 MPH, reducing the power when turning base and roll out on a high final at about 80 MPH. I use an aggressive slip to keep the runway line-up in sight until rounding out over the runway end. Here I align the longitudinal axis of the airplane with the runway and cross-control for any crosswind. I reduce the power to idle and fly in the ground-effect until the aircraft touches down. Almost always in a 3-point attitude or even tail wheel first. I do wheel land occasionally, but mostly just for fun. I used to teach that in a strong crosswind with a steerable tailwheel, get all three gear on the ground and use the rudder and tailwheel steering to control direction, not the brakes! Still works for me!

Second— For keeping runway alignment in the round-out, I look out one side and then the other until just before touch-down, then revert to peripheral vision at the very end.

Third— For older folks or anyone who wears bi-focal lenses while flying and you are having problems finding the runway when landing, try taking off the glasses or raising your goggles when flying the pattern. I found that as the nose of the aircraft came up in the flare, so did my head and I was trying to find the runway looking through the reading portion of my glasses—that didn't work for me!

Last— Practice on wide runways early on, then move to short, narrow strips; be an expert slipping your machine, and kicking it out for touch-down, and where ATC and traffic permit, get good at military 360 degree overhead approaches—looks good and lets you keep the pattern tight and the runway insight.

Oscar Bayer, Arroyo Grande, CA

Dear Glen and Clay,

Here are my thoughts on how I land my Starduster Too. I was lucky in that by the time I was trying to learn how to land my newly purchased Starduster, I had already put in a lot of hours in a Stearman. The Stearman sinks like a rock, just like my Starduster, it blocks my view of the runway during the round-out, just like my Starduster, and they both bounce about the same, if not landed correctly!

I picked up my Starduster in Southern California, and for two days my very patient instructor and I bounced our way around all of the Class Delta airports that would have us, narrow ones, wide ones, long ones and most important of all short narrow ones! The technique I picked up from him was to keep the speed up, around 90 MPH until short final. The higher speed allowed me to see the runway and try and get the wind drift figured out. As soon as I was over the fence all the power comes off and all that drag just slows the Duster down. As soon as I lose the runway straight ahead I move to peripheral vision out of both eyes. I sort of focus on nothing and get my altitude and alignment cues from the runway edges. This is where a long wide runway will fool you into thinking you are lower than you really are. I assume the flare position, three point flat, and I let the airspeed bleed off. If I have it all in close formation, I feel all three wheels hit at once. I continue to use rudder all the way down to taxi speed and leave the brakes alone. I like to fly close-in patterns as opposed to straight in, right or left pattern does not seem to matter.

Downwind abeam the numbers I like to be 100 MPH and 1200 feet AGL, if there is no other traffic to follow I turn base when the runway numbers are just slightly aft of the lower wing. Once established on base I keep a sharp look-out for traffic that I might cut off and reduce power to about 1700 RPM. Base to final I am around 90 MPH and 700 feet. Once established on final all the power comes off and I lower the nose. I break the descent over the numbers and start to flatten out the approach and assume the three-point attitude. Speed is usually around 80 and slowing. I then just wait and "sense" the motion of the aircraft, the sound of the wind through the wires and my altitude. If I have flared too high I will let just a touch of back pressure off the stick and let it settle a little. This is where a bounce can occur if you let the nose drop too fast.

Crosswind landings are another matter. I will fly a little longer pattern just so I can feel the wind crab before I throw in correction. I went over to an old abandoned runway one time when I knew there was a stiff crosswind and worked out my procedure. I will figure out the crab required to stop runway lateral movement, balancing rudder and

aileron and I will hold that crab all the way down to touchdown. Naturally it seems that the wind direction or intensity changes as I get closer to the ground so I have to change the amount of crab as required. The point is, don't center the control just as you touch down as doing so will induce some side loading and that, dear friends, is the beginnings of a ground loop. Hold the correction in until you are going slow enough to taxi. I can't tell you how many times I have relaxed on the wind correction crab only to have the airplane lift a wing or try and swing around on me.

If the crosswind is really fierce, like greater than 20 knots and 30 degrees, go land somewhere else! But if you are low on fuel and need to put it down now, here is a technique that seems to work for me. I will put in as much crosswind crab control as I am comfortable with and then plan on a wheel landing. I will lower the upwind wing into the wind and keep the plane going straight down the runway with the rudder, land on that wheel and fly it on one wheel until the other wheel comes down on it's own as the plane slows down. Then I hold crosswind correction with the stick and plan to get on the brakes to keep the tail from swinging around. The rudder and tail wheel will not be enough control in a high crosswind situation. With the stick in the appropriate crosswind position holding the wing down I gently apply downwind brake to counter the body turning moment that is certainly there. I find I need to use a lot of brake as I taxi off the runway in such a high crosswind situation.

The only time I have ever landed downwind was when I was with the Starduster crowd headed for OSH and was really out of sorts with that landing. It felt as though the plane would never settle onto the runway and as I tried to flare I could feel the tail lifting as the wind got under the tail! I don't recommend going out and landing downwind but since it happened I am the better for the experience.

Happy flying and let's be careful out there!

Mike Gustafson, 3242R, Menlo Park, CA

Dear Glen

Thanks for your letter on the subject "How do you land your Starduster." Well!! I'll have to give a short version of the experience. It would take me

volumes to explain all the frightening—sudden terror—anguish—to get this bird on the ground. Naw, but it was fun. At least I thought it was when I got on the ground. Remember, I hadn't flown a tail dragger in over 40 years. I intended to rent something in a Champ or a Citabria. A friend of mine, Wayne Ingle, who has a Starduster told me not to do it, go fly your own airplane—learn in it. So that's what I did. Guess it worked out O.K. I have about 75 hours on the bird so far. I don't get to do much flying for various reasons. Hope to in the future.

Landing a Starduster—Well! The last time I flew a tail dragger was in the 50's. I received my license in 1947 using Champs, Cessna 120's, 140's, then progressed into nose-wheel aircraft.

In 1997 my Starduster was ready to fly. So what to do?! I didn't think I was capable of being a test pilot. So here comes another friend of mine—sure nice to have capable friends. His name is Hal Averyt—he is an ex-navy fighter pilot. The test went with no problems as he put on a good show for everyone. The next day when notable people were not around, he said, "you're next!" So he checked me out. It was a thrill to be able to build an airplane and fly it for the first time. The way he showed me to land this airplane at my home field (Grants Pass Airport here in southern Oregon), was to fly downwind at 100 mph—cut the throttle at the numbers—turn base slowing down to 85-90 mph, looking to the right for any straight-in approaches. (This is a left hand pattern field). Now turning upwind, slowing down to 80 mph, a little sideslip to see the runway and line up straight—head and eyes straight ahead—slowing over the fence, picking out a spot on the horizon (we have a lot of mountains around here). Eyes straight ahead, using peripheral vision, start flaring out holding off the stall—hold it off—hold it—hold it, then pull back the stick into a smooth full stall. Then easy on the rudder pedals. Don't over control—roll out—turn off onto the taxi strip and start over again or put it in the barn for another day.

The second way that I tried landing this wild mustang was a little different—downwind opposite the numbers at 100 mph, bring the nose up and slow the plane down about 85 mph and crank in some tail heaviness—turn base and set up a rate of descent around 300 ft./min, again looking to the

right for any traffic. Control rate of descent with throttle and airspeed with the stick—the usual side slip—straighten out—slow up with the flair—ease off throttle—continue flair—chop the throttle and land. This is more like flying the aircraft with power all the way to the runway.

Next is using the same procedure with throttle and stick using a military approach from downwind with the runway always in sight, which is nothing but a descending, 180 degree turn to the field. The bad part with this procedure is watching out for other traffic under that upper wing.

Crosswind approaches— All I can say here is to go back to basics when you first learned to fly. Keep that upwind wing down. Strong headwinds down the strip—use more throttle.

This happened to me twice in my Starduster until I changed the linkage on my tail wheel. After a hard landing I lost a wire clip that holds the compression springs for steering—boy! What a wild ride I had rolling down the runway with no control but the rudder—lucked out—no damage and I got a thumbs-up from my instructor. Next time it happened was at Merced Fly-in. This time I wound up in a plowed field—lucky again no damage. I'm now using threaded chain links. They work just fine—no more trouble.

Well, that's about it Glen. I'm not a very experienced pilot flying Stardusters or tail draggers. I only have about 75 hours on my bird. It has been a lot of fun and good experience. Scared as hell at times, but mostly good fun.

Good luck—hope this will help someone on their machine. See yuh'all at the airport.
Bob Caravas, N49BC, Grants Pass, OR

How I Land My Acroduster—

I have been asked by one of the Starduster readers to tell you about all the torture I go through when I land the Acroduster. Well, that's not all true. I feel quite comfortable when landing, even if they are not all perfect landings.

Landing the Acroduster is different than landing the Starduster because of the symmetrical wing. When landing, I come in over the fence at

100 mph indicated, then start my flair a few feet off the runway. If you hold the same nose up attitude as you have while just sitting in the airplane, you will probably make a good landing. Of course I sideslip just a little to keep the runway in sight. You don't see out of the Acroduster as well as you do the Starduster, so you have to use more caution when landing. Also, too slow of a speed will put the nose too high and will slam the tail wheel on the runway first. Don't take me wrong, the Acroduster with a little practice is a very pleasant airplane to land.

If the runway is wide I use peripheral vision, if not, I will look out the left side and parallel the runway. I will have to admit, I need more practice in order to look out the right side, especially in a strong crosswind. It's a lot less of a problem for me than in a Starduster.

I have always said that if there is a very strong crosswind, I hope it's in the Acroduster, because it is usually a piece of cake to land. Last year at the Hill Air Force Base fly-in, they turned all the small airplanes away because of a 30 mph crosswind. I talked the tower into letting us land, and although it was a little challenging we had no problem at all. I guess it was because Loretta said, "go for it."

For crosswind landing, I tip the wing into the wind, use rudder to hold it straight, and three point it on. The only time I wheel land is for practice. Usually when the Acroduster settles on the ground, it stays. It takes more rudder work than the Starduster, but as long as you don't over do it, it's not too bad. Like Bill Clouse says, "Stay ahead of it or lose it."

It would be nice to have more articles from you readers on wheel landings versus three point landings. The Starduster is much nicer to wheel land than the Acroduster.

Well, I hope everyone is enjoying their Stardusters and Acrodusters as much as I am. Hope to see a great turn out at Oroville and Wautoma this year.

Feel free to call me any time, I love talking Stardusters.
Glen Olsen, N34LG, Salt Lake City, UT

Lou Stolp Receives Charles Taylor Year 2000 “Master Mechanic” Award

By Roger Brownlow, Safety Program Manager, Airworthiness.
Flight Standards District Office, Riverside, CA.

On Thursday evening, February 17, 2000, Louis A. “Lou” Stolp was awarded the prestigious Charles Taylor “Master Mechanic” Award by the Western Pacific Region of the Federal Aviation Administration. Lou Stolp was honored for his many years of involvement in the aviation industry as a certificated Airframe and Powerplant mechanic. The presentation took place at the Charles Taylor Award Presentation Banquet as part of the annual Inspection Authorization Renewal Seminar conducted by the Federal Aviation Administration and AVIALL in Buena Park, CA.

Lou Stolp, the original founder of the Stolp Aircraft Corporation as well as the designer and builder of the Stolp Starduster, Starduster Too and other variants of this design, has had a long and interesting career in aviation.

He was born in Peoria, IL, on March 30, 1920. His interest in aviation began early in life. As an elementary school child he would visit the airport on weekends and holidays. As he approached high school age he rode his bicycle the 10 miles to Mt. Hawley Airport in Peoria. At the age of 15, he acquired his first motorcycle, a 1922 Harley Davidson. This became his transportation to and from the airport. Lou says that the bike weighed half a ton and he weighed 115 pounds so at his father’s insistence he added a side car. Around this same time, he got his first job at the airport working for Leroy Murphy. He wasn’t paid in money, but instead was given the *privilege* of sleeping on the hangar floor.

In 1937, he completed high school and continued to work for Murphy who, by then, had moved to Springfield, IL. He still worked for no pay, but Murphy’s wife, who owned a restaurant, fed him and he was promoted to sleeping on a cot in the hangar. His peers from high school thought he was crazy, but his “job” took on a different slant when he asked how much they were being paid for going to college. He didn’t have enough money to attend one of the aircraft mechanics schools, so he did the best he could.



When he began his aviation career, the regulations governing repairs and alterations of aircraft, engines, propellers, and accessories were contained in Manual 7H, a tabloid size pamphlet of approximately 20 pages. Civil Aeronautics Manual 18 was

eventually published and included the first instructions on cable splicing. Prior to that time, all cables in need of splicing were sent to St. Louis. This, of course, was before the days of nicopress sleeves. Needless to say, every airplane that came to Lou for inspection in the next six months required all new cables.

He earned his A and E license in December 1940 and decided to get as far away from Illinois as he could and still be in the United States. He took a job as an A&E Mechanic working for Marvin Shook, the owner of a flight school in Taft, CA. Lou took this job without even knowing where Taft was.

In 1941, when the war started, all flight schools were required to move more than 150 miles from the coast. He, along with Shook, ended up in Quartsite, AZ, which was similar to Taft, only hotter. As he recalls, the school had four J-3 Cubs, 2 Meyers OTW, and a Howard DGA15, which had such excellent performance in the hot weather that it would not break ground after 10:00 a.m.

As time went on, Shook sold the flight school and Lou moved to Welton, near Yuma, AZ. With the war in full swing, all mechanics and flight personnel were required to join the reserves to keep them from being drafted. By this time, he was associated with the United School of Aeronautics, owned by Louie Lyco. It sounded very impressive, but actually the school was smaller than Shook's. Here he maintained three Ryan STs, one Vega, and three or four Interstate Cadets. He really liked the Ryans with the 125 horsepower Menasco engines. He liked them so much, in fact, that he bought one after the war.

Some time later, he received a letter advising him to either resign from the reserves or apply for active duty. The next thing he knew, he was in the tail of a B-17 behind two 20-caliber machine guns. He was among the list of the top ten gunner trainees to graduate from his class of 500. Lou was held over as an instructor but managed to convince the Army Air Corp that instruction was not his strong point. The Army agreed and transferred him to Drew Field, in Tampa, FL, for advanced B-17 crew training.

He went through considerable combat training but spent so much time in the States that the war ended before he flew any combat. Somehow the Air Corp learned that he had an A&E license, so he was soon checked out as a flight engineer and flew approximately 500 hours over Italy, Germany, and France on courier and training missions.

When he came home after the war, he settled near Mines Field (now Los Angeles International Airport) where he was met by his friend George Adams, who handed him a note . . . George had sold Lou's BT-15 and together, they opened an aircraft supply business in Compton, CA.

Some of the memorable events while at Compton included the conversion of a Waco UPF-7. They installed a high head rest, a canopy, added 650 X 10 tires, Model D Monocoupe wheel pants, a front removable cockpit cover, and a 300 hp

R-680 Lycoming engine. Lou had found his calling.

As the aircraft supply store in Compton flourished, they began to manufacture windshields, canopies, as well as Firestone wheels and brakes under license. The original 3-view drawing of the Starduster was laid out on the lid of a shoe box and the first airplane was built while at Compton. The plane was trailered about 25 miles to the Orange County Airport for its test flight because that was the closest airport in the area with low density traffic. He flew the plane the entire morning and only one other airplane (a BT-13) entered the pattern.

Around 1960, he decided to go in business on his own and leased some property on the Corona Airport. Here, he established the Starduster Aircraft Corporation. While at Corona he designed and built the Starduster Too, the two-seat version of the original Starduster. This was the first two-seat biplane available to the homebuilt market. After the Starduster Too came the Starlet, the Volkswagen-engine powered V-Star, and finally the Acrostar, an acrobatic version of the Starduster.

Finally, Lou incorporated as the Stolp Starduster Corporation and moved to Flabob Airport in Riverside, CA. While he was there, he built a replica of the Black Maria and the Sopwith Triplane flown by Canadian Ace Raymond Colishaw during World War I. Sadly, this airplane was later destroyed by fire at the Aeronautics and Space Museum in San Diego, CA. Lou sold the corporation to Jim Osborne in 1972 and acquired the master lease for the Redlands, CA, Airport. He and his wife, Joy, still live in the Redlands area.

This nationally recognized award was initiated by the Federal Aviation Administration in honor of the first Aviation Mechanic, Charles Edward Taylor. To be eligible for this award, the applicant must have worked in the aviation maintenance industry for a minimum of 50 years. Of those 50 years, a minimum of 30 years experience as a certificated mechanic with at least one rating or 30 years experience as a certificated repairman is required. Eligible individuals may apply for the award at their local Flight Standards District Office (FSDO), or another person may request the award on behalf of an eligible person.



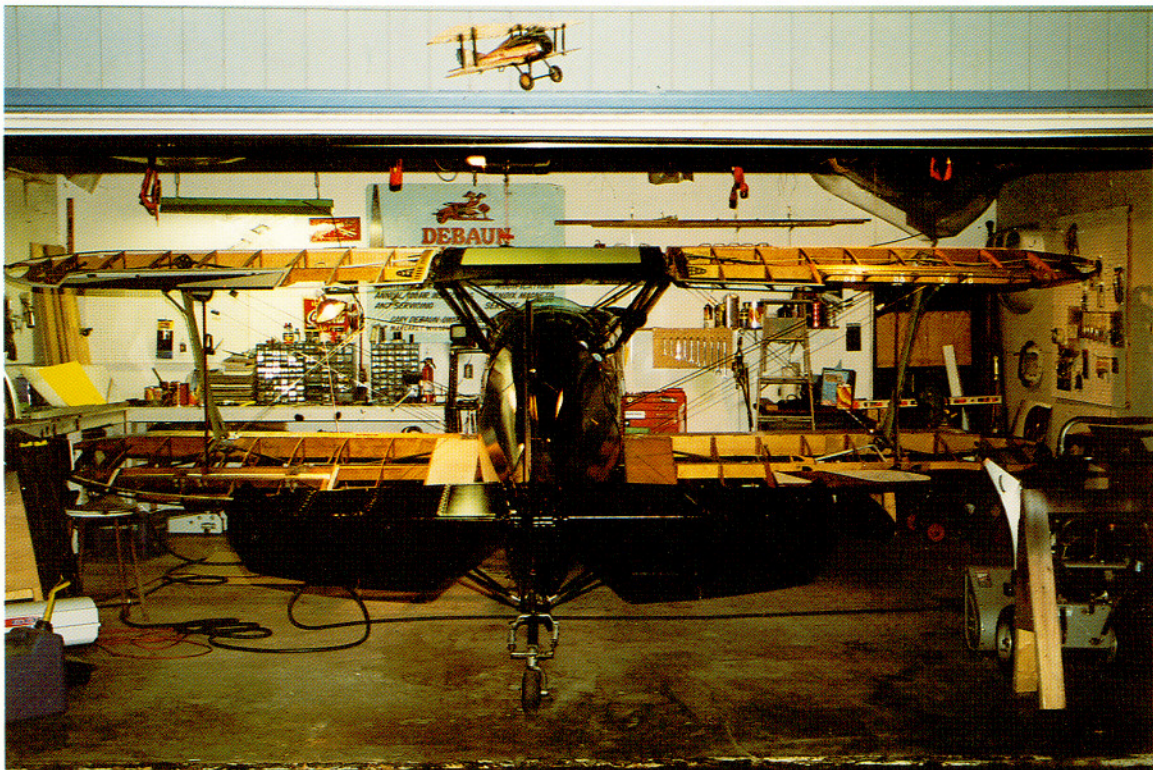
SA300, Lou Hagler, Langley, WA



SA300 N490B, Oscar & Bob, Mt. McKinley, Alaska



SA100 N70163, Tm Hudson, Greensboro, NC



SA750, Chris DeBaun, Lakeville, MN



**Bry Anderson, Glen Olsen, Liberty Lloyd
Heber Valley, Utah, Fly-in**



V-STAR N46A, Bill Boyd, Waco, TX



SA750 N34LG, Glen & Clay to Wautoma '99



Breakfast at Willows, Oroville Open House '99

Tech Tips

Saga of 4226Y, w/ The Chevy 4.3 V-6 Power Plant, Part IV.

By Les Homan, President, Starduster Corp.

I have been finalizing nose bowl and cowling designs. Exhaust system changes have proved to be the most challenging to date. Since changing to the new nose bowl we have tried five different exhaust systems. Versions of short stacks, versions of a log type and finally six equal length tubes. To give you an idea of performance changes, engine RPM has run from 3,600 to 4,400 RPM at full throttle. After adding 1 degree of pitch to prop I am still getting 4,200 RPM. I believe with some fine tuning another degree of pitch can be added.

Something I have heard many times is that a Lycoming or Continental is just an engine and it ought to be easy to install an auto engine. I believe this falls into the category of the person who can land a Cub and thinks landing a 747 would be easy because of aviation advancements. It does not work that way. If you take a Lycoming and install short stubby exhaust pipes a change will be noticed. Generally in the form of noise and 50 to 100 rpm. With an automotive engine this is not the case. It makes the difference of an engine working or not. Automotive engines have a lot of engineering involved. Flow through the intake system and exhaust systems did not just happen, it was very carefully engineered, both on the board and on the track. When you install this engine in your airplane and start changing intake/exhaust components the engine may not do what you expect it to do.

I get people asking me why not use a different engine than the 4.3 Chevy V-6. I know how much research and development has gone into what I have to get me where I am. I had an experienced person, Jess Meyers, to work with, who was doing the same thing I wanted to accomplish. He is using the RV-6A. All I wanted to do was set the drive system up for a Starduster Too. I feel confident that moving up to the Chevy 350 V-8 will have minimal research and development time. I am designing engine mounts, radiator mounts, nose bowl, and cowlings for either engine. To install any

other engine will require considerable research and development time. I will be happy to pass along the things I have learned, but I am not interested at this point in time.

We have moved the exhaust pipes to exit the cowling in a vertical down position in front of the firewall. There are three separate exhaust tubes on each side. This allows the exhaust piping to be installed on the outside of the engine mount. The radiator is being moved to a point below and at the rear of the engine mount. It will be installed at an angle to allow easier change of direction for the airflow. Radiator air will enter at the bottom of the nose bowl and will be ducted to the radiator. Turning vanes will help redirect the air flow through the radiator. Once air exits the radiator it will leave through the back bottom of the cowling, where the exhaust system would normally be. A cowl flap will be installed and will be used for ground operation and climb. The opening around the propeller will take in air for engine, carburetor, and oil pan. Air will exit at the top of each hinged cowl door in the rear.

The new nose bowl allows for excellent over-the-nose visibility. It is lower in the middle and drops away on each side quickly to present an improved view.

The performance has met all my expectations at this point; it will out-climb and out-run the 200 horsepower Lycoming. Since I have changed from the original nose bowl and exhaust system I do not have a good reading on fuel consumption. The prop is working as expected. The engine and exhaust system will be out in the open for easy inspection and maintenance.

I still need to add a windage tray to the crankshaft area. Uphill is not a problem. Had it at 45 degree angles and oil and fuel pressures do not change. Downhill is a different story, even with power off. Oil likes to get into the crankshaft and it drives oil temperatures up and pressures down.

I am working on the new mount now, it will be

set up for both the V-6 and Chevy 350 V-8. If a person is interested in aluminum engines, Chevy has some neat crate engines. As I understand, 300 horsepower is no problem. I am looking at putting the V-8 on the Acroduster Too.

I have not run auto fuel yet but intend to do so in the next two weeks. I understand the high octane stuff is required.

We are working on the information package,

engine mount and nose bowl for the Starduster Too. If you check out our web site we will update pictures of the installation and of the new mount as we get it built up.

Still having lots of fun and have enjoyed this challenge. I want to thank Jess Meyers for all his help and support. I plan to fly to Las Vegas after I get the new mount in place and show Jess where I am at.

Upgrading the Acroduster Carb. Intake System

by Glen Olsen, Salt Lake City, Utah

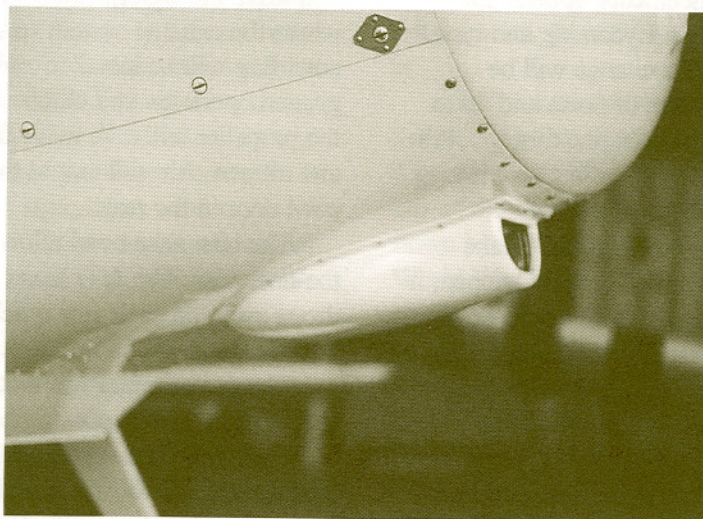
Every year in the winter, I try to think of something to do on the Acroduster to improve it. I am very lucky to own a hangar with heat, a rest-room, and all the things that make it nice to work on your airplane. It is located at the Skypark Airport in Bountiful, Utah, about seven miles north of the Salt Lake

International Airport. This year I removed all the induction system off the Ellison throttle body. It looks like I filled a bushel basket full of junk and weight. I called Van's and ordered an Intake System for an RV-4 that is designed for the

Ellison. It is very simple and very easy to install. It has the perfect filter and alternate air, etc, and of course the price is right. Van's are neat people to deal with. You will have to do a little work on your

lower cowl, or if you are building, this will not be a problem. The next thing to do is to build an intake scoop. This is quite easy because all you do is make the scoop 1/2" larger than the intake housing supplied by Van's. I used molding putty from a hobby shop, and formed it around the

intake, then layed fiberglass around it, finished it off and painted it. You can use 1/2" foam if you don't have the putty. I used nut plates and truss head #6 screws to secure it. That way you don't have to take the lower cowl off to clean the filter. Van's makes this system for regular carbs and pressure



carbs, also.

Well, I hope this will be helpful. The new air-scoop will be a lot smaller and it looks great!!

So, You Want to Increase Your Starduster Speed.

By Les Homan, President, Starduster Corp.

First a disclaimer. I am not an aeronautical engineer. My spell check can't even figure out what they are. I like to tinker and increasing the speed of my Starduster Too, 4226Y, has been an on-going experience since the first flight, back in July 1981. When I built the Super Starduster, 9116Y, and raced in Reno I was able to expand my knowledge and get other perspectives. Over the years I have read several articles on the subject and talked to various people involved in making things go faster. The information provided is meant to stimulate ideas for thought and pass along my findings.

One of the reasons for my interest in increasing speed had to do with my first flight and performance specifications for the Starduster Too. My plans said it should operate at 150 mph at 5,000 feet with the 180 hp Lycoming. I have a 200 hp Lycoming, a very light airplane and a top speed at full throttle of 115. This was at about 1500 feet MSL. Perfect plane, flew great, everything I expected, except for speed.

I could get into all the little details about increasing top speed from 115 to over 150 but it would get boring and may not apply to your aircraft. I will talk in general terms about overall findings.

There are two approaches to making it go faster. The first is while you are building, and the second is when you have a flying airplane and just want to pick up a few miles per hour. I will try to cover both points.

Drag reduction: This has to be the key word. Rigging the aircraft properly is the first step in drag reduction. On a dead calm day rig your aircraft for level flight. Be very gentle on the controls. Fly long enough to let air speed stabilize. Slowly step on a rudder pedal to make the aircraft fly slightly sideways. Move the controls so you maintain level flight. Fly in this attitude long enough to let things stabilize. Look at air speed. Try this with ailerons and with trim tab on the elevator. You have just experienced what rigging can do. Something as small as a trim tab on a control surface does the same thing. Some aircraft

may not fly properly without the trim tab.

Rigging: The first step is to make sure the aircraft is rigged as accurately as possible. This includes alignment of trailing edges, slave struts, wings, center section, fuselage and tail surfaces. In normal flight the elevator and horizontal stabilizer need to fly flat. This will take some adjusting to correct.

The ailerons should be in the same positions. Concerning aileron positions in flight, if the ailerons are rigged to droop approximately 1/4" on the ground they should come up to even with trailing edges in flight. There is discussion that rigging so that ailerons fly about 1/4" above the trailing edges in flight may increase the speed. I have not noticed a difference. If you have everything rigged perfectly on the ground, but in the air the ailerons do not respond equally, i.e., one aileron raises an inch and other one on same side moves 1/2", things are not rigged or built properly. You may have to compromise on the final settings.

Incidence in lower wing— I have had the lower wing incidence set at both ends of the adjusting screw. I did not notice much difference in speed. As rigging is changed, make sure the wings maintain proper dihedral and incidence. You may have to adjust the push/pull tubes, adjusting screws and flying wires. If your rigging is off, correcting problems can increase speed, and it will most certainly make a difference in handling.

A major source of drag is the area in front of the firewall. Engines need to be cooled. Air entering the nose bowl, crossing the engine and exiting is the single highest source of drag—more than flying wires, I struts, cabanes, and slave struts combined. Many factors are involved with air flow in front of firewall.

Flat plate area: This equates to drag on the airplane compared to a flat plate. One square foot of flat plate area would be like mounting a one square foot flat plate in front of your airplane and pushing it around all the time. Take a one square foot board and hold it out the window while someone drives your car. Pressures grow as the speed goes up. Imagine this force at 115 to 150 miles per hour. This pressure is holding your aircraft back. As I

understand, a 200 horsepower Lycoming will put out 500 pounds of thrust. Thrust pulls us along. The drag pressure takes away from the 500 pounds of thrust. If it is 50 pounds, we now only have 450 pounds of thrust.

For an idea as to where Starduster type aircraft rate, the most efficient planes have flat plate areas of slightly more than 1 square foot. Aircraft like Cessna 172's may have a flat plate area of 15 and a Starduster may have a flat plate area of 18 to 20. What about a big radial engine on the front of your Starduster? Well, it will be more than 20. All drag is equated to a flat plate. Some areas are easy to see, such as flat areas on the nose bowl. Not as easily seen or changed is drag over the wings.

Air flow over your aircraft: Ideally we would place our aircraft in a large wind tunnel and check out air flow problems across the surfaces. I haven't figured how to talk NASA into letting me borrow their wind tunnels. Another approach is tuft testing. I have tried this with varying degrees of success. Get some small diameter yarn, cut to about 1½ or 2" lengths and tape it around the area of study. Use a good quality automotive masking tape that can be removed easily. This method shows what is happening in areas where you can see or where a camera can be mounted.

Flying in the rain is another way of determining where problems are. I have noticed rain coming up over the front edge of the wing and contacting the flat fairings that cover where the flying wires enter the wing. The flow is no longer straight, but fans out in all directions. Same thing with screw heads. Keep everything as flat, as small and as clean as possible. Taping the flying wire where it penetrates the wing is smoother than a nice aluminum 0.016 fairing with four small screws to hold it in place.

Another bit of information gathered over the years from one of our EAA meetings was to eliminate nozzles. This is any area where air changes speed without need. Two examples are the lower wing root and the front landing gear attach points at the fuselage.

Another testing device is the ever popular smoke system. Turn it on and see where the smoke comes from, with the front cockpit covered, uncovered, slow flight, high speed, steep turns and so

on. It also leaves beautiful oil trails on the belly of plane to help determine where turbulent areas stand out.

The Bug Tunnel: I accidentally discovered a better method of determining flat plate area. A friend of mine had just finished cleaning his Lancair and I had just finished cleaning my Starduster Too. We left at the same time and went flying. I stayed down low, 500 to 1,000 AGL. In about an hour we both returned. After we taxied in I was getting ready to de-bug my airplane—not a small task. He ran a rag across the leading edges and started to close up and go home. I stopped him and asked where the bugs were. We talked a while and I discovered he had been flying in the Central Valley of California, same general area and altitudes as I had. I was moving about 120 MPH, and he was moving closer to 200. He had traveled a much further distance in the bugs, yet he had almost none. He closed up and headed home and I sat down and did some thinking. If he is going faster, has less bugs and the ones he did get were easily removed, this may be a way to determine drag. We had both waxed our planes, his has a slick fiberglass covering and mine, except for fairings, is fabric covered. I checked the aluminum fairings, which cover up the wing root to the center section. These are aluminum and have a finish similar to the fiberglass covered wing. On the leading edges, the bugs were difficult to remove and as the front edge became rounded it was easier to remove the bugs. A similar thing was happening on fabric covered surfaces as well.

I decided to use my new found bug tunnel and try to eliminate as much flat plate area as possible. The flat plate area considered to be that area where the bug smash was the biggest and hardest to remove. The first areas worked on were the front flying wire attach fittings—the ones extending out from fuselage. I built a set of fiberglass fairings for this area. I bug tested and found that the bugs were either not there, or there were only streaks, not smashes, and they were easily removed.

Other areas and findings:

- I-strut attach points at the top and bottom of the I struts. This is an area where the fittings extend from the wings. I made some small fairings to eliminate this flat area. A large

fairing to cover the top and bottom of the entire I strut would be better.

- Front of round landing gear attach legs— I had no fairings on my landing gear. The round main gear leg had a substantial build-up as compared to the front of the streamlined I struts. I installed streamlined spats.
- Windshields, especially the front one— The shape, slope, height of the front windshield can make a major difference in drag increase/decrease. Which windshield is best, straight formed, bubble, or Stearman style? I believe that any of the three will work.
- Front of tail wheel spring— This may seem like a small area, but a small fairing is easy to make.
- Gas tank filler necks extending above the cowl line— Make a fairing or modifications to place inside the cowl line.
- Wheel pants, brakes, brake lines and general wheel area— Make everything as smooth as possible. For maximum speed you want to seal the tire and wheel to the wheel pants in such a manner as to prevent air flow from entering the wheel pants; however, there can be no rubbing. I believe this measure is for racing purposes only. Cutting down on large openings could be beneficial.
- Install lower wing root fairings to eliminate the speeding up of air over the front of the wing and the slowing of air as it expands between the fuselage and the wing root in the area between the front spar and the trailing edge.
- Keep it light— The lighter an aircraft is the better it will perform. Keep it in the proper CG ranges. From racing, it is my understanding that it is better to be closer to aft CG than forward CG for pure speed. In the context of this article, consider two identical Starduster Too's, except that one has a worst case aft CG of 23 and the other has a worst case aft CG of 26.5 inches. The faster of the two would be the one with a 26.5 worst case CG. CG limits are 18 to 27 inches aft of the firewall. Do not exceed aft CG limits. If the two planes were identical except that one was not rigged properly, it would make a larger difference than working with CG.
- Proper rigging— It is interesting when flying

in the rain to watch the ailerons and move a wing up or down. Then repeat on other side. Does the exact same thing happen? In a given area of the aileron gap, do the rain drops go down and disappear on one side and just sit there on the other? In bug flying, do you notice more bugs on a lower right wing than the other wing panels? These are things that you can see and feel. To make an accurate speed run for comparison purposes you need to be very light on the controls. You need to be able to go to altitude, trim the airplane, fly parallel to a road, (on a dead calm day) as long as you want, without control input of any kind. If you need to put a little pressure on a rudder pedal, or touch the stick slightly, or hold a little aileron, you are not rigged properly. Rigged properly is much more than just adjusting flying wires and adjusting linkages. If you have a flying aircraft this may be all that can be done without some rebuilding. If you are building, build for proper rigging from day one. When you get to a point where you can fly very light on the controls, and it stays where you want it you are now ready to get some meaningful speed readings.

- Propellers can make a large difference in speed and climb— Metal seems to be the most reliable and repeatable. However, wooden or composite materials have other advantages. Ground adjustable composites are another choice.
- I have left the largest area of flat plate drag for last. This is the area in front of fire wall. Start at the spinner, work back and see where the bugs are. Typically there will be some at the very tip of spinner, a few at the spinner-prop junction and lots of them on the cowling. Typically, areas close to the spinner are flatter and will have large amounts of bugs, while areas closer to the rounded edges will have less. Now you will have some holes in your nose bowl, either one large one or two smaller ones. Study where the bugs go after they pass through these openings. Lot of times they sort of smash themselves against front edges of the baffling. Placing the baffling a little less flat may make a difference here. Look at the belly of the engine cowling. Any build-ups here? Re-

shape, re-form or change the fairings.

While on the subject of engine and cowling, here are some things to consider in working to go faster. A large part of the total drag takes place here. Do not let any air into the engine cowling that is not needed; do not waste any air that enters. Design the system so that the air will exit near the same velocity as it enters. There must be a negative pressure at the exit during all aircraft attitudes.

- **Entering air**— I started my Super Starduster with a standard two-hole nose bowl. It had two openings of approximately 84 square inches each. After testing and developing, the openings were reduced to 24 square inches each. I had dropped from 168 square inches to 48 square inches entering the cowling. I can fly at any attitude, at any temperature, at any altitude. The oil cooler was mounted in the nose bowl for both cases. No wasted air entered through the nose bowl.
- **Oil cooler**— How many people do you know that can operate their aircraft with the oil cooler taped off 50% on the hottest day of the year and have no heating problems? I can. **Solution**— Put the oil cooler in the nose bowl, on the lower left side just below the crankshaft center line.

This way there is no air leakage, no loss of pressure, no loss of flow and the air will not get any cooler—no wasted air. I let my air enter the general engine area, but an even better way would be to install a reverse NACA scoop to exit the air on the side or top of cowling.

- **Engine baffling**— I use a cover on the top of my engine, no seals except for the engine box

to the front of the nose bowl—total leakage of air about as close to zero as possible. I installed a tapered duct behind the nose bowl openings to allow the air to slow down. These were about 12" long and were sloped at about 7 to 10 degrees.

Air leaving the engine cowling— I installed large radiused corners to eliminate any sharp edges. Adjusting and getting the exit air opening just right took many attempts. I believe there is still a better way.

Comments— The bottom exit area of the cowling is generally a high pressure area, and the area on top of the cowling is a low pressure area.

Racing calls for some measures you would not do in normal flying. Four-aileron aircraft have the top ailerons locked in place, all joints taped and slave struts removed. Every joint and seam is taped for smoothness. Props are changed and tested.

In the years I have been flying my Starduster Too and the Super Starduster the two areas of major speed increases have involved the windshields and the prop-spinner-nose bowl combinations.

The one thing I can say, when you have made improvements to help your speed, you will generally notice it first on the approach to landing. With a high drag machine you sort of point at the runway and adjust power to fly it there, sort of like landing a powered rock. As drag decreases you will find yourself needing to pull power further out, reduce speeds on final and side slip more. The high drag machine gives you the feeling that you could land in Joe's back yard. The new improved machine makes you plan ahead. A very good feeling.

Good luck and happy speed hunting.

The Ignition Lead

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The ignition lead directs the energy wave from the magneto to the spark plug. The lead shielding prevents the radiation of wave energy. Because the lead exhibits reactance, it modifies the energy wave.

Capacitance is the ability to store an electrostatic charge between two conducting plates separated by a dielectric. Lead insulation is called a dielectric meaning it can store electrical energy as an electrostatic charge. An example of electrostatic energy storage in a dielectric is the static electricity stored in a plastic hair comb.

In an ignition lead the conductor is one plate of a capacitor and ground the other. Shielding the ignition lead increases capacitance by bringing the ground plate closer to the conductor plate. The ignition lead consists of a conductor covered with a dielectric, and then metal braid shielding (another conductor) and then air (another dielectric) and then the engine (another conductor). Electrically the lead acts as a linear capacitor and has the ability to absorb and store electrical energy. The energy stored in the lead is called distributive capacitance; it is essentially static electricity at rest. The magneto must produce enough energy to charge the distributive capacitance and have enough energy left over to fire the plug.

Ignition lead capacitance increases the energy required to spark the plugs. For example, a Slick coil with 1.5 ampere primary current will fire a 5 millimeter test gap using a three foot ignition lead with the lead's shielding ungrounded. Once we move the ground plate closer by grounding the shielding, the coil won't fire the gap. More primary current is needed to fire the plug with the shielded lead.

Distributive capacitance is released once the plug fires and becomes conductive. The lead discharges when a conducting path is provided between the plates. The ignition lead shielding and one side of the spark plug gap are connected to the engine block. The other side of the spark plug gap connects to the lead's inner conductor. Ionization of the spark plug gap completes the circuit between the ignition shielding and the ignition lead's inner conductor.

The rapid rise-time of a capacitive spark erodes the spark plug's negative electrode. The resistor within the spark plug (Champion uses a 5,000 ohm resistor) reduces plug erosion by dissipating some of this energy as heat.

Distributive capacitance can be lowered by:

1. Removing the ignition lead's radio shielding.
2. Shortening the ignition lead.
3. Avoid routing the lead against the engine case.

For all practical purposes lead capacitance is a function of lead length.

If we reduce distributive capacitance:

1. More reserve magneto energy is available to fire the plug.
2. Less spark plug electrode erosion occurs.

A small, thin, weak-looking spark is characteristic of a capacitance spark. The fat, big blue spark that the Bendix S1200 series magneto produces is characteristic of an inductive spark.

The ignition lead has inductance. That is, the lead stores energy in a magnetic field and releases this energy when the spark gap ionizes. Lead capacitance and inductance offer a resistance to the flow of current called ignition lead reactance.

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Aircraft Electrical Bonding

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Good electrical bonding of various parts of the airframe structure produces a number of beneficial results. Bonding provides a single homogeneous conducting medium, ideally, a zero-potential, zero-impedance body.

Bonding reduces electrostatic EMI by preventing the build-up and subsequent discharge of static charges. Bonding prevents surfaces from electrically resonating and radiating EMI. Bonding eliminates harmonic EMI by eliminating current rectification at contact surfaces. Bonding assures that all parts are at the same potential, which prevents higher RF current flow in one part of the structure than another. All RF generators should have a low-impedance path to ground; bonding assures this.

The engine should have a good ground to the engine mount. Sometimes an aluminum clamp is used around the engine mount. This makes a poor RF ground. The dissimilar metals oxidize and form a high impedance ground path. Poor grounds caused by oxidation can in themselves create and radiate RF fields by rectifying current.

Any corroded joint in which ground currents are flowing can rectify current and transmit RF radiation. A rectifier passes current in one direction and opposes the flow of current in the opposite direction. A common man-made rectifier is a diode. In nature, rectifiers are common in the presence of high intensity RF fields.

Corroded magneto distributor cap contact

springs (the ones in the towers where the harness fits into) can radiate large amounts of RF into avionics. Cleaning the contact springs with contact cleaner usually helps.

A good ground for RF frequencies is much harder to achieve than a good DC ground. As current frequency increases from DC to AC, the opposition to current flow becomes less resistive and more dependent upon the capacitive and inductive characteristics of the ground connection. Thus, a good RF ground has low DC resistance and reactance. This is generally accomplished by having:

★ Low resistance. Ignition harness shielding to magneto cap should be less than 3 milli-ohms.

★ Clean, paint-free surfaces. For example, new Bendix D-2000/D-3000 ignition harnesses are supplied with a cover that has paint where a portion of the capacitor trap attaches. This attachment is part of the RF ground for the capacitor and should not be painted.

★ If using a bonding strap, for example between the engine and mount, the strap should be as short and as fat as possible. A short, fat strap increases the width to length ratio and lowers high frequency impedance. Large surface area means low inductance.

★ All ground points should be at the same potential (voltage). This is achieved by connecting all grounds at a single point or by grounding at multiple points on an equipotential ground plane.

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Traffic Hazard

A Bonanza landed at the airport with the leading edge of the left wing bashed in from hitting a goose in flight. A remark from a Cessna driver was overheard: "If he'd been flying a high-wing air-

plane, he'd have missed it."

(If he had been flying a biplane, he would probably have hit two of them).

Ditching Old Wives' Tales

By Doug Ritter

(Extracted from AvWeb.com)

Ditching—the word alone can strike fear into pilots and passengers. A recent article in AOPA Pilot magazine claimed that ditching is a very hazardous emergency procedure that most do not survive. AVweb's Special Projects Editor, Doug Ritter, also Editor of the Equipped To Survive Web site, responds, "hogwash!" In truth, nine out of ten ditchings are successful and a few simple preventive measures can improve on even those excellent odds. Doug exposes numerous old wives' tales and explains how ditching is an eminently survivable experience.

Old Wives' Tales

"Unfortunately, most ditchings are unsuccessful. Even with help close at hand, airplanes often skip once, then flip over or plow under before anyone aboard has a chance to escape.

"If luck is with you, the airplane stays upright and no one is injured to the point of incapacitation. If it isn't, the airplane is hit by a wave and sinks immediately."

Really? If by "unsuccessful," one means that the airplane can't be used again, that's probably true. On the other hand, I cannot conceive how anyone could interpret the readily available facts to conclude that the majority of ditchings are unsuccessful, or in other words, that they result in a fatality or fatalities either in total or due to the failure of the occupants to exit the aircraft. Even a cursory review of National Transportation Safety Board (NTSB) or U.S. Coast Guard (USCG) records will reveal that most ditchings are by this measure, or any measure, successful, meaning that the occupants escape from the aircraft reasonably intact or that there are no fatalities.

More specifically, *Aviation Safety's* Paul Bertorelli (a former *AVweb* News Editor and currently Editor of *The Aviation Consumer*) has conducted a review of NTSB accident records in his article "Ditching Myths Torpedoed!" His bottom line on general aviation ditchings: "Although survival rates vary by time of year and water-body type, **the overall general aviation ditching survival rate is 88 percent.**" Moreover, Bertorelli's analysis concludes that, "... **the successful egress rate is 92 percent**, meaning that in more than nine out of 10 cases, at least some of the occupants got out of the airplane and ultimately survived the experience." Bertorelli further reports that, "If you exclude what we consider to be the high-risk

over water operations—the long distance ocean ferry flights that are only a small part of the total over water flying—the egress rate rises to an astonishing 95 percent."

But, what if you only consider open ocean or cold water ditchings where the waves are bigger, hypothermia becomes a bigger problem, and rescue can be far away? Is it hopeless? We know of a number of highly publicized instances where pilots ditching in the North Atlantic survived, which immediately disputes the statements quoted at the top of this article. Moreover, Bertorelli found, "22 blue water ditchings . . . there were four fatalities in this group of 22, for a survival rate of 82 percent, not too much worse than it is for coastal or inshore ditchings." So, even the worst possible circumstances don't make that big a difference in the survival rate.

Bertorelli's numbers are in close agreement with my own research of NTSB and USCG ditching reports. No matter how you play with the numbers or what fudge factor you might add to cover unreported ditchings, you are unlikely to adversely impact the results to any significant degree, and certainly not to the degree necessary to support the statements above, given the known facts.

Why Prepare To Ditch?

Does the prevalence of such old wives' tales about ditching really matter much? Is it really a problem if pilots have a negatively unrealistic expectation about their survival chances? While at EAA AirVenture Oshkosh 1999, I presented a Ditching and Water Survival seminar and I spoke with Gerard Pickhardt, V.P. of Winslow LifeRaft Co. He told me of his experience at the Winslow booth during the event discussing with a pilot his interest in a life raft. The pilot was clearly inter-

ested in improving the safety of his operations; however, he stated, "I know if I do ditch though, I don't have a chance of surviving." Ergo, why invest in survival gear when the outcome of the ditching is unlikely to be successful? In fact, Pickhardt and his aviation sales representative, Steve Weatherly, both reported numerous conversations similar to this one.

I had a few similar ones myself during the course of my stay in Oshkosh and via a variety of online media over the past couple months. Pickhardt commented that while denial by pilots is always something that must be overcome to sell life rafts, as all of us in the flight safety and survival business know too well (see Barry Schiff's "Safety Is A Tough Sell"), this flurry of abject resignation over the outcome of a ditching is new—just evident since July. The bottom line is that these old wives' tales are dangerous and must not actively dissuade pilots from preparing to survive a ditching.

More than just convincing them they don't need survival equipment, such misinformation also puts pilots in the worst possible state of mind. A positive state of mind is an individual's most important survival tool. If a pilot is already convinced his chances of surviving are slim, then there is a good chance that reality will conform to his preconceptions. The message that a ditching cannot be survived isn't just wrong and misleading, it is potentially deadly.

High-wing Flips?

So, what about the oft-repeated old wives' tale that high-wing aircraft almost always flip over in a ditching and as a result surviving is unlikely in such circumstances? Records concerning whether high-wing aircraft are more likely to flip after impact with the water are not so easy to find; NTSB and USCG records are remarkably silent on this issue. Bertorelli found only one, though that in itself might be significant. However, one can draw some conclusions from the experiences of the large number of ditching survivors who have been interviewed or about whom news articles have been written. I have personally interviewed many such survivors (or their rescuers) in the past five years, approximately half of whom were flying fixed-gear, high-wing aircraft. Only three reported flip-

ping over and completing the water landing upside down, and all survived the experience.

Irrespective of whether the aircraft ends up sunny-side up or sunny-side down, the statistics tell us pilots and passengers generally get out safely. Commenting on the high overall survival rate, Bertorelli notes pointedly, "if *every* high wing airplane flipped over on impact or cartwheeled end-over-end across the water—highly unlikely, by the way—the occupants still managed to egress successfully." Is it a bit disorienting if the ditched aircraft does end up on its back? No doubt it can be, but that doesn't appear to have any significant impact in the real world of general aviation ditchings. Is training helpful? Sure, it could keep you out of that small percentage of fatal ditchings, but is unlikely to make a big dent in the overall stats.

Instead, the most common scenario I find is that the aircraft, high or low-wing, fixed gear or retractable, simply noses into the water sometime after initial impact and then bobs back to the surface. All survivors I have spoken with had adequate time to exit the aircraft before the wings sank below the surface. However, there is no doubt from my interviews that those flying low-wing aircraft have it easier getting out and often report time to get organized and retrieve items while standing on the wing and before entering the water or life raft.

There appears to be no data to determine how quickly a particular aircraft will sink. The vast majority report the aircraft sinking shortly after exiting, but some noted the aircraft floating for a considerable time, up to an hour or more in a few cases, days in a few others. In one case I find rather interesting, the quick-thinking survivor clambered onto the rear fuselage of his Mooney and by holding onto the vertical stabilizer, he balanced the aircraft to prevent it nosing over and sinking for long enough to allow for rescue some hours later.

Practice Makes Perfect

Don't let anyone tell you that you can't practice ditching. Well, no, you can't actually hit the water, but a major part of practicing forced landings is not the landing itself, which like a ditching isn't all that different than a normal short and soft field landing, but rather the selection of an appropriate landing spot. While difficult for land-locked

pilots, for anyone who plans to fly regularly over water, or who is interested enough to make the effort, it is easily done. Pilots can be instructed, or can practice themselves, how to identify wave and swell patterns, swell and wind direction, and how to prepare the aircraft and any emergency equipment while making a descent towards the water. Doing so will also allow you to accomplish this from higher altitudes and far more accurately and quickly.

This is not significantly different than similar techniques used when practicing normal emergency landings. An added benefit is that after the first attempt to don a life vest under simulated emergency conditions from low altitude, the pilot should quickly become convinced of the need to wear a life vest at all times when flying over water. Preparations for ditchings can and should be practiced.

Just A Passenger?

Yet another OWT suggests that once you hit the water the pilot becomes just another passenger along for the ride—that from that point on the outcome is beyond his control. That is nonsense. It is critical that the pilot continues flying the aircraft until it stops, just as in a normal off-airport landing. My many interviews with ditching survivors support this concept. This is important because it is quite possible that rather than nose-in, the aircraft may skip off the surface of the water on initial and subsequent impacts. In such instances the pilot must continue to fly and maintain control until the aircraft impacts the water the final time.

While the aircraft generally decelerates and stops in a very short distance, the pilot may still be able to control the roll attitude of the aircraft to a certain extent for a short time after initial impact, especially in high-wing aircraft, and keeping a

wingtip from digging into the water until the last possible moment can be a real benefit. The point being that a pilot may well have more control than the old wives' tales suggest and it does no good to suggest otherwise, contributing to a pilot's poor attitude towards survival. The point being that a pilot may well have control of the airplane most of the way through the ditching event. "Flying" the airplane through the ditching as long as possible can only help increase the emergency maneuver's survivability and help overcome the pilot's poor attitude towards survival.

Life Vests

Yes, you do need a vest for every person in the aircraft, and a spare never hurts. However, forget about donning a life vest on your way down to the water, especially so if you're the pilot. Getting into a vest inside the tight confines of a typical GA aircraft is difficult at best, even for passengers. As pilot, you have lots more important things to attend to. As noted above, a little practice should easily convince you of that. If you're flying over water, wear your life vest at all times.

Exposure Suits

Hypothermia is always a potential danger, even in moderate water temperatures, but especially in colder waters. The past few years have witnessed a revolution in exposure suit design. For example, there are now numerous comfortable and practical options for pilots that improve upon the old-style neoprene closed-cell foam rubber exposure suits similar in many ways to a SCUBA diver's dry suit, but looser and bulkier). A serious disadvantage of the old-fashioned, ill-fitting neoprene exposure suits is that they are difficult to fly in if fully donned.

Stardusters in the News

Phil Hax made the cover of the Autumn 1999 issue of *Air News New England*, flying Young Eagles in his Starduster Too, equipped with skis,

no less. A photo of the plane taking off in a flurry of snow is also shown on the title page of the magazine. Congratulations, Phil!

The January 2000 issue of *Sport Aviation* featured an article, "Biplanes You Can Build." Of fifteen biplanes written up in the article, three are

products of the **Stolp Starduster Corp.**, the Acroduster I, the Starduster One and the Starduster Too. Congratulations Stolp Starduster Corp.!

News From The Net (Avflash@a1.ipcc.com)

13 Dec. 1999

AOPA Says FAA Changes to Part 145 Could Cost You Big Bucks— The FAA's NPRM on Part 145 changes to the regulations governing certification of aircraft repair stations needs work itself, according to AOPA. The association's vice president and executive director of government and technical affairs, Dennis Roberts, last week said that the changes "would lead to significantly higher maintenance costs for general aviation aircraft owners." While the FAA's motives may appear fine and nice, practical application of the rules could force some shops to give up their certificates while stretching the FAA to its administrative ends, and AOPA fears the result may be a 30% increase in repair costs next time your bird needs work.

10 Feb. 2000

SATS has NASA dreaming of "highways in the skies." NASA is looking at developing a network that would provide more than 5,000 GA airports with the ability to land light aircraft day and night in most kinds of weather. The program, dubbed the Smart Air Transport System (SATS), intends to function primarily using advanced aircraft cockpits that have "autoflight" capability—which sounds marvelously practical while at the same time turning the joy and art of flying into an experience comparable with riding an elevator. Insiders are predicting that funding for SATS could appear as early as FY2002.

10 Feb. 2000

NASA Updating Aviation Safety Web Site— Probably recognizing the usefulness of the Internet for disseminating information in a timely fashion, especially safety data, NASA has plans to update their Aviation Safety Reporting System (ASRS) Web site. The updated site will include the NASA printable forms for reporting incidents, and copies of ASRS's "Callback" and "Directline" safety publications, among other safety information.

10 Feb. 2000

AOPA Not Happy with FAA Plan for "Plain Lan-

guage" Regs— Though AOPA agrees with the FAA's plan to write future regulations in plain language instead of "government-speak," they recently stated their objection to the FAA's proposal to prohibit "non-public" communications with FAA officials once an NPRM has been published. AOPA is urging the FAA and DOT to reconsider the policy and allow informal conferences with FAA officials.

14 Feb. 2000

...But Who Gets to Fly and Why?— Petitions from EAA and the National Air Transportation Association (NATA) have been approved. Under the EAA exemption, private pilots who are EAA members will be able to fly "charitable airlifts" under Part 61.113(d) without a drug test, and commercial pilots who are EAA members will be able to fly up to four charity flights without submitting to the testing. NATA's flight school members will be able to give rides to the public at fly-ins and other events to promote aviation. The piecemeal efforts of the FAA at "fixing" the legal interpretation are rapidly becoming as clear as mud. Are you exempt if you offer your services to promote aviation at the local aerodrome? Maybe, maybe not. Deny everything, admit nothing, and good luck out there.

Feb. 14, 2000

General Aviation Blowing and Growing— 1999 was a berry, berry good year for general aviation, with record billings and a double-digit increase in shipments. The General Aviation Manufacturers Association (GAMA) tracks such things, and released its industry review last week. Industry billings were the highest in history at \$7.9 billion, up from \$5.9 billion in 1998. Aircraft shipments were at 2,525, up from 2,220. GAMA believes the increases have more to do with foresight and policy than free-flowing dollars. GAMA Chairman Chuck Suma says because the U.S. has been willing to develop and adopt new aviation technologies, the country is entering the 21st century as the world's leader in aviation. The future's so bright, we might have to wear shades.

Feb. 28, 2000

After years of trying, the EAA and FAA have hammered out an agreement that should put an end to the confusion over homebuilt aircraft operating limitations. Previously the limitations pretty much depended on what part of the country you lived in and which FSDO's jurisdiction you were under. The EAA-FAA guidelines have now been inserted as part of the homebuilt certification manuals used by all FAA offices and inspectors. The gist is that homebuilt aircraft are prohibited from operating in places where there are a lot of planes or people unless approved by ATC, or unless they're flying at a high enough altitude to make a safe emergency landing. Once the initial Phase 1 testing of the plane is complete, no further approval will be needed to fly over populated areas.

March 3, 2000

Proposed Law Would Save Back-country Airstrips— Rep. Jim Hansen (R-Utah) last week introduced a bill into the U.S. House of Representatives that would block efforts by federal agencies to close or limit access to back-country airstrips on public land. Hansen, a pilot and a long time supporter of general aviation, is chairman of the House Subcommittee on National Parks & Public Lands. He introduced the AOPA-supported "General Aviation Access Act" (H.R. 3661) to save remote airfields, most of them in the western United States, that have been targeted for closure or threatened with restricted GA access by federal land managers. AOPA President Phil Boyer said that such airstrips are necessary for search-and-rescue operations, firefighting, forest management and research, and as emergency landing areas.

Notice to Subscribers—How to Read The Mailing Label

We have done our best to help remind our esteemed subscribers to renew their subscriptions before they run out. We have progressed from relying on the expiration date printed on the mailing label, to including a renewal notice in the magazine, to acting like the Big Boys and sending out a statement for the subscription renewal. Each step has helped. But there are still those for whom this is not enough.

Ken Nowell, at Starduster Corp. (who receives and records all subscriptions) has suggested that we remind our subscribers of how to read the ad-

dress label on the Magazine. If you would like to know when your subscription will expire, look at the number in the upper right hand corner of the address label. That number gives you the year and quarter of the last issue for which you have subscribed. For instance, if you see **2000/2** on your label, the April 2000 issue is the last one you will receive unless you renew before the next mailing. (By the way, there are 39 of you who have 2000/2 on your labels! Now would be the time to slip a check in the mail to Ken so that you won't miss receiving the next exciting issue).

Calendar of Coming Events

- **May 19-21** 20th Annual Starduster Open House and EAA Fly-In, Oroville, CA
 - **June 2-4** 14th Annual National Biplane Convention & Exposition, Bartlesville, OK
 - **July 5-9** Northwest EAA Fly-In and Convention, Arlington, WA.
 - **July 26-August 1** EAA AirVenture 2000, Oshkosh, WI
Starduster Annual Fly-in, Wautoma, WI
 - **October 12-15** Copperstate Regional EAA Fly-in, Mesa, AZ
-

CLASSIFIEDS

ADVERTISING CLOSING DATES: MARCH 1, JUNE 1, SEPTEMBER 1 AND DECEMBER 1. CLASSIFIED ADVERTISING RATES \$5.00 PER COLUMN INCH, MINIMUM CHARGE \$5.00. MAKE CHECKS PAYABLE TO STOLP STARDUSTER CORPORATION. THANK YOU.

FOR SALE

Starduster Too Project— Fuselage & all components factory welded, permanent cabane struts, tabs welded on fuselage to allow sheet metal to rear seat. Wings & Cntr Section aligned to fuselage at factory, allowing standard flying wires. Stainless steel firewall, Cleveland brakes-wheels, two military throttle quadrants, stored in hangar at North Las Vegas Airport. \$10,000. Lee Darrah Jr. 702.873-2858, pm. 002

N639PK Starduster Too built by Lou Stolp in 1974. 1030 hours since new, airframe & engine. Lyc O-360-A1A. All AD's complied with. 720 Collins Com., GPS, Mod C Trans., intercom, ELT, sliding canopy, & full instruments in both cockpits, always hangared. Pictures on request, Cleveland brakes, Scott tail wheel, cockpit heater. \$29,900 Consider Trade. Art Hanson 520-567-6660 hanson@cybertrails.com. 001

Half share available in Starduster Too, 180 Lyc. Inverted fuel & oil, Hooker Harness. Radio & Xponder, based Kissimmee, \$10,000. Contact Matt Clark, UK 0044-191 4556892/101 5281715 or John Rossa, 407.396-7162. 994

Starduster SA100, TT 330, O-290, 125 hp Lyc. 185 SMOH, new radio, transponder, elt, upholstery, prop. Cleveland brakes, strobe, nav & landing lights, elec. start, fresh annual. Spare upper & lower wings, engine case, fuselage, parachute. \$13,500 406.961-3554 after 5 pm MT. 994

Starduster TOO. Completed 1989. 455 TT, 355 SMOH on 200 HP Lyc. IO-360A1A, 355 since new on Hartzell CS aerobatic prop. King KT-76A Transponder/Mode C & KLX-135A Comm-

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FROM THE STARDUSTER WEB SITE

WANTED

Looking for a nice, well-built Starduster II for sale in the Southeastern U.S. Prefer 180 hp or more.-
Bob Pfister, rtaildragr@aol.com 4/1/00

FOR SALE

I have Starduster II project for sale 95% complete, health problems. Will sell with or without 0 time O-360 engine. 717-432-7389 4/1/00

Starduster II For Sale, TTAF&E 750 Hrs, O-360-A1A, 180 hp, Metal FP Prop, Com, Transponder Mode C, Intercom (really works), Annual Sept 99, Built in 1971, always hangered, flown regularly and is in excellent condition, located in TX at TX05, \$25,500. 972-490-7346. 4/1/00

Located in Culpeper, Virginia, a wonderful example of very clean Starduster One. I just installed an O-320-150 hp engine with just 30 SMOH by reputable shop. Aircraft in excellent condition and I am prepared to negotiate a fair price. Includes like new seat chute. Give me a call if you want a fun plane that performs and is really an eye turner. 540-349-1507 4/1/00

Starlet SA500 Fuselage. If you have one or know of one, please contact Ben. Telephone: 208-375-1813. 10/15/99

Starduster For Sale. 160 hp Lycoming engine, less than 200 hours on engine. Constant speed Hartzell, New King 97, Apollo Loran, Heated, Ready to Go. \$35,000 CDN (approximately \$21,000 USD) Contact Jeremy Dann. 1/15/99

Starduster Too - SA300 Project Wanted!! I am looking for a project that is in need of a new home. I have the plans but would like a project that someone may have pushed to the back of their hangar. Send me the details and specifics of the project you want to get rid of and let's see if we can work something out. I would be interested in anyone that may have completed sections and parts as well. Even if you only have the wings completed, or just

the fuselage only, drop me a line. Contact Dave Honaker, Dallas TX. 972-716-2527 10/15/99

1971 Starduster Too SA300 for Sale. Right Side..Left Side.. 517 TT, 70 TT SOH O-320A2B engine. Paint and fabric new in 1986. Beautiful navy colors done by Starduster, always hangered. New tires and brakes, Cleveland's. Sigtronics intercom, nav lites, beacon, wired for Icom A-22 radio. Cover for front cockpit. Excellent workmanship. Annual done 7-99. Asking \$28,500.00 O.B.O. T. Somrdem located Apple Valley, CA Telephone: 760-242-1117.10/15/99

Starduster II Wanted!! Looking for one in flying condition. Send details, history, price, and pics if available. Will travel in Western U.S. to see the right plane. Mike Carter. Posted: 7/3/99

Stolp Starduster for Sale!! Aircraft has a Lyc. O-320, 160 hp engine. 145 hours total on engine and airframe. KX175B nav-com. Fresh annual. New brakes and tail wheel. Flies great. I'm restoring a Navy N3N and need the \$ to complete this project. Contact Vernon Anderson, Wisconsin. Telephone: 920-787-5357. -- Posted: 7/3/99

Starduster SA100 project parts for sale!! Builder's data plate and airworthiness certificate, original aircraft log, 517 hours TT. Right upper wing complete, left upper wing spars and ribs with both wing tanks, right lower wing complete, left lower wing spar broken at tip. Extra set of lower wings with ailerons. Fuselage with tail feathers and control systems, cowling, fuel tank, Bodel-Adams wheels and brake system, Ceconite 102 cover kit, windshield, set of McWhite stainless flying wires. \$3,500. O-290-G engine and prop available also. Contact Talmadge Scott, Hernando, FL. 352-637-3511. -- Posted: 7/3/99



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