

CANARD PUSHER

JULY 1996

RUTAN AIRCRAFT FACTORY

VOL.11, ISSUE 3, NO. 85

The Boomerang flies!

Memorial Day weekend. At a time when most people were packing a picnic and flying for the hills to celebrate the national holiday, Burt stood alone in one corner of Scaled Composites and stared at his airplane.

He began construction on the five-place, pressurized twin three years ago. In Burt's estimation that was exactly two years and six months too long.

It was an ambitious project in more ways than one. Burt's 202nd design — the Boomerang — pushes the envelope of strange shapes with an asymmetrical configuration so weird Burt's sister wondered out loud whether there were pieces missing. A quick peek into the cockpit at the instrument panel brings even more surprises. To put it bluntly, there are little, if no, instruments in sight. The traditional cockpit displays have been replaced with a laptop computer and a special data-reading program called the Rutan Aircraft Performance Monitor and Analysis System (RAPMAS), which was developed by (who else?) Burt's son Jeff Rutan, a Hughes software engineer and his partner Art Ortez, a Hughes electronics engineer. (However, a temporary set of cockpit displays had been set-up for Boomerang's first flight, since RAPMAS was not yet completely wired-in).

The Boomerang sat on the back burner for nearly two years while Burt and company Scaled Composites completed an array of successful high-flying projects for his customers. While other airplanes were rolled

see Boomerang pg 7

A new configuration is born

by Burt Rutan

The Boomerang represents more than just a new aircraft type, it is indeed a new solution to one of the biggest problems in General Aviation.

The engine-out safety of most twins is so bad that even though they provide engine failure redundancy, they kill more people per mile than singles. Commercial manufacturers have largely ignored this problem except for Cessna's Skymaster. When the Skymaster proved to be a slow, noisy way to go, even Cessna abandoned further attempts to improve the hazards.

In 1978 I developed a new configuration, the Defiant, to address engine-out safety. The safety qualities of the Defiant were excellent and have prevented accidents, however the Defiant, like the Skymaster has a pusher engine that produces more propeller noise and creates more drag. The in-line thrust makes it difficult for the pilot to access which engine has failed.

The Boomerang configuration addresses the problem in an entirely different way. The puller props are arranged to be as close as possible to each other for low engine-out yaw (prop tips are only 12-inches apart in front view). Also, not apparent in a quick inspection, the configuration handles the propeller-induced yaw (P-effect) at high angle-of-attack in a unique way. Unless you fly a Duchess with counter-rotating props your aircraft requires right rudder when slow at high power. This is because P-effect moves the true thrust line to the right as angle-of-attack increases. A glance at the Boomerang would indicate that more yaw would occur if only the left engine (at BL= -56) were running rather than the right (at BL= +32). This is not true. The P-effect cancels the difference so the minimum control speed is actually lower with left engine running.

VMC is really a misnomer for the Boom, since at stall only about 1/2 rudder is needed! In fact, the Boom flies quite nice single engine at *any* speed with the pilot's feet off the pedals!

Also, with both motors operating, the Boom flies straight at all speeds from full-aft stick minimum speed to the dive speed. There is no roll or yaw trim changes with speed.

In fact, this new configuration has the best flying qualities of any light aircraft we have flown.

How is this done? A complete answer is beyond the scope of this article. Watch the aviation press as the various pilot/writers evaluate the Boomerang. I think it may be a bit humorous to see how they figure the reasons, but we are sure they will be as delighted in its handling as we are.

RAF CD-ROM to debut at Oshkosh

see story pg 3

BRIEFS

The great resin search

For those who are still dealing with the sticky problem of what epoxy system to use and where to get it, Terry Schubert recently printed a very informative editorial on the subject. Contact Terry at Central States Association and ask for a copy of the July '96 issue the CSA Newsletter: 9283 Lindbergh Blvd, Olmsted Falls, Ohio, 44138-2407. Back issues cost \$5.

Hot dogs at Oshkosh

If you plan to attend Oshkosh 96 make sure to mark your calendar for the Central State's annual hot dog roast, on Friday, August 2. The evening roast begins at 4 pm at a campsite located west of the campground bicycle parking lot (on the south side of the campground entrance to the Air Show). This is a MUST-DO, especially if you are new to Oshkosh, as conversation generally revolves around the wonderful world of building and flying canard aircraft. Check the Homebuilder's Building on Wittman Field for exact location and any changes. Hot dogs and lemonade will be served for a small charge.

Burt to receive EAA award

Tom Poberezny, Oshkosh Convention Chairman, will present Burt with the 1996 "Freedom of Flight" Award on Saturday evening, August 3, at the Theater in the Woods. The award recognizes an individual's contributions to all spectrums of aviation. Past recipients of the award include Cliff Robertson, Neil Armstrong, Hoot Gibson, Barron Hilton and General Chuck Yeager.



To report accidents and incidents


Write: Rutan Aircraft Factory
1654 Flightline
Mojave, Ca 93501

or Fax: (805) 824-4174
Attention RAF

RAF HOURS: Rutan Aircraft is officially open every Tuesday. Please call between 9 am - 2 pm and give your name, serial number and nature of the problem. If you are not in an emergency situation, we ask that you write to Mike.

Note — Sometimes you can catch Tonya at RAF Monday thru Friday. She is in and out. Try and try again.

When writing to RAF, send along a stamped, self addressed envelope, if you have builder's questions that need to be answered. Please put your name and address on the back of any photos you send.



The Canard Pusher

is published quarterly
(January, April, July, October)
by Rutan Aircraft Factory, Inc.
1654 Flightline, Mojave, CA 93501
Editor: Mike Melvill
Publisher: Tonya Rutan

U.S. & Canadian subscriptions
\$14; Back issues \$3.50
Overseas (Airmail) subscriptions
\$16; Back issues \$4

RAF is no longer accepting multi-year subscriptions. Please renew only after your current subscription has expired.

If you are building a RAF design, you must have the following newsletters:

VariViggen (1st Ed)
CP 1 to current
VariViggen (2nd Ed)
CP 18 to current
VariEze (1st Ed)
CP 10 to current
VariEze (2nd Ed)
CP 16 to current
Long-EZ
CP 24 to current
Solitaire
CP 37 to current
Defiant
CP 41 to current

A current subscription of the Canard Pusher is mandatory for builders, as it is the only formal means to distribute mandatory changes.

Reproduction and distribution of the Canard Pusher is approved and encouraged.

RAF CD-ROM to debut at Oshkosh

RAF is pleased to announce that the first-ever RAF Encyclopedia CD-ROM will be available for sale at Oshkosh '96.

If all goes as planned, you can get a look at the new CD-ROM and place your order August 1 - August 7 at the Ken Brock Manufacturing booth. As many of you know, RAF gave up its own booth at the annual air show a couple of years ago. However, Ken and Marie Brock will kindly allow RAF and CD-Rom developer Tait Engineering, Research & Fabrication Inc. (TERF) to set up a computer display in the corner of their booth.

For those of you who won't be able stop by in person, I will give you this review: *it's great!* Burt & I got an opportunity to play with a Beta prototype edition earlier this month and we were very impressed. This highly professional CD-ROM allows users to view a nearly complete collection of RAF documents, including Canard Pusher newsletters, aircraft owners manuals, the Moldless Composite Construction manual; and yes, even the aircraft plans, except for Defiant. (The plans also do not

include a license to build and do not include the large templates).

Quality color artwork and easy-to-read menus make the RAF Encyclopedia CD-ROM a pleasure to work with. Burt and I got a real charge the first time we queued the line-up of pretty pictures ("Wow!" he said. "Cool!" I said) which include selections from our favorite RAF posters as well as a few from our private collection.

That's all well and good, but it is the incredible search engine that makes the RAF Encyclopedia CD-ROM a truly valuable tool. The newsletters are full text searchable. You will be able to search newsletters 1 - 83 for that one bit of information you need with a word and a push of a button. No longer will you have to flip endlessly through photocopied pages of size 9-point type scanning for that one paragraph about vortelons you remember reading some time ago but can't seem to locate now. Not only will the RAF Encyclopedia CD-ROM tell you exactly where to find information on vortelons, but it will highlight the word and magnify the page to a size that is comfortable for your reading pleasure.

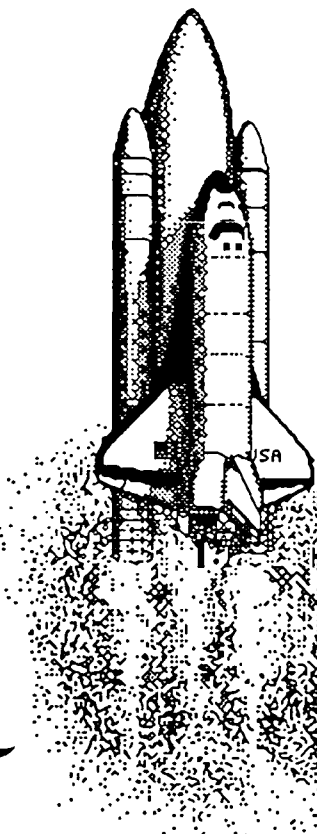
All other documents are made readily available by topic heading and sub-heading menus. To limit the possibility of misconveying the intent

and information of any of the documents, many of which were written in the 70's and 80's, each page has been scanned into the data base in its original page format. This allows you to access "photographic" images of each document. The Long-EZ owner's manual, for instance, appears on the computer screen complete with drawings just as if you were holding the booklet in your hand. It's easy to page through to find the chapter you are hunting for, and best of all, to print *what* you need *when* you need it.

RAF's new CD-ROM was produced by Tait Engineering, Research & Fabrication Inc. (TERF), a Brighton, MI corporation established in 1991 for the purpose of exploring opportunities in advanced prototype projects of many different types. Some of these include High Performance Composite Aircraft, Advanced Avionics and Computer Control Systems, Advanced Engine Controls (Spark, Fuel Delivery, Rotary Engines and Reduction Drives) and many others.

While cost for the RAF Encyclopedia CD-ROM is expected to run between \$350 - \$395 (the average price for a full set of Canard Pusher newsletters) first editions will sell at Oshkosh for an introductory price of \$295. The 2200 or so documents included on the 3-CD set include the full ADOBE Reader software with both single page and full volume search capability. Volume 1 of 3 includes the installation programs for DOS, Windows 3.X, 95, NT, Macintosh Unix, SGI and SP.

Whether you are building, flying, or just plain interested in the Rutan canards, it is clear that the RAF Encyclopedia CD-ROM is the best way to access over 20 years worth (and a really high stack) of RAF history within minutes.



Another Canard pilot goes into orbit!

EZ builder Frank Caldeiro recently informed RAF that he has been selected as a NASA astronaut "Mission Specialist." Oh boy, are we proud of you Frank!

Frank said that his Long-EZ N9FC now has 305 hours and "still goes like a brand new clock."

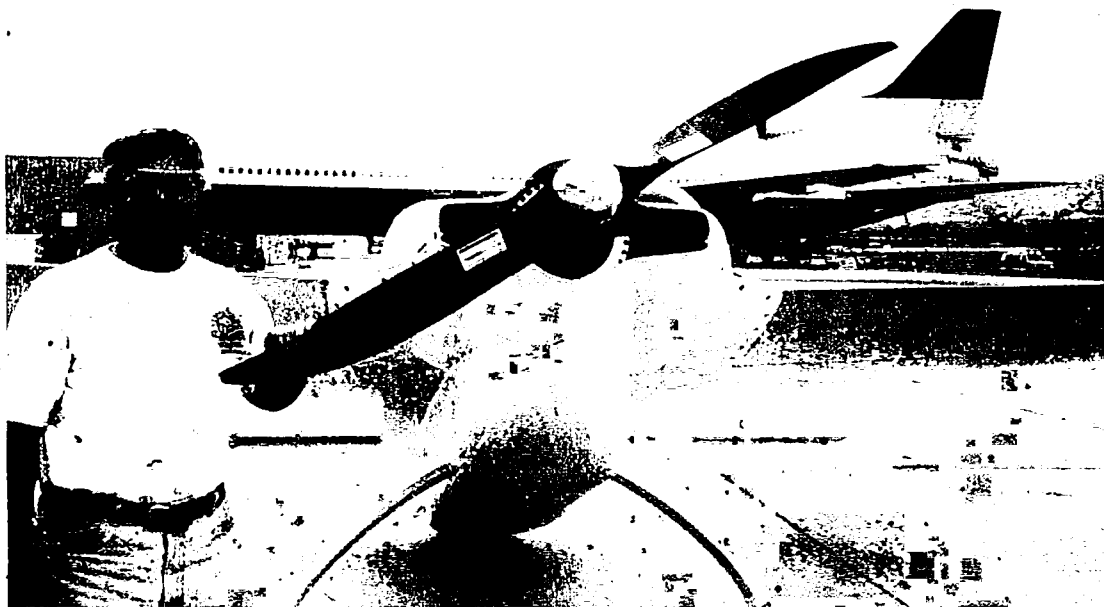
RAF now has three canard drivers flying the shuttle: Jim Voss, Charlie Precourt, and Frank Caldeiro. Congratulations to all of you!

Reflections on exhaust pipes and props

b
y
P
a
u
l
T
a
c
k
a
b
u
r
y



Timing is everything — In both photos the engine is clocked so that one exhaust valve is just beginning to open. The prop has been clocked one bolt-hole anti-clockwise in the lower photo relative to the top photo. (Top) The prop passes the exhaust at the moment that hot exhaust gas exits the pipe, therefore the prop runs in a blast of hot air everytime it goes by. (Bottom) The blade is never in the path of the hot exhaust gas.



by Paul Tackabury

Sitting by the pool at Jackpot Nevada while enjoying a cold one after another successful RACE event seems a good time to reflect on recent speed mods and share lessons learned and even real data. But first some background and a primary rule of thumb: if you want to go fast in the Super Stock class (a somewhat stock Long-EZ with a lyc 0320) you must visit Santa Paula and give a bag of money to Klaus Savier. If the bag is a very large one, you can come away with electronic ignitions, go fast wheel pants, graphite props and bee's butt spinners special designed for pushers. I have done most of that over the years and picked up 30 mph as these and other refinements moved N84PT from the back of the pack to the front.

Of course, speed is a fickle lover, so in order to stay in the front even more improving was required. Therefore, over the '95-'96 winter I added an "inside the cowl" exhaust system. This exhaust system started as the Hal Hunt design, but required considerable cutting and welding to fit inside my cowl without adding more speed bumps to the back of the plane. The final result was quite like the Melvill installation featured here a few issues back. The inside of the four pipes are 15 inches apart, ending 5 inches in front of the prop. Like Mike's, they are angled inboard to point the exhaust at the prop hub just outboard of the spinner.

Although I did not enjoy the 5-kt speed increase that Mike reported, this "inside the cowl" arrangement is a real improvement as it moves the hot pipes further away from fiberglass and eliminates those ugly charred places you find on the back of most Long Ezs where the pipes exit in their own holes.

Lessons learned: when I inspected after the first

5 hours of operation, I found the graphite prop had delaminated inside the spinner. This delamination probably resulted when epoxy cooked out of the prop by high temperature inside the spinner. I believe the open point on the aft end of the Klaus spinner caused low pressure inside the spinner which sucked the hot exhaust in through the clearance cutouts around the prop.

Whatever the cause, it was clearly getting very hot inside the spinner, much hotter than a few inches outboard where the exhaust actually hit the prop. In any case, I wanted to

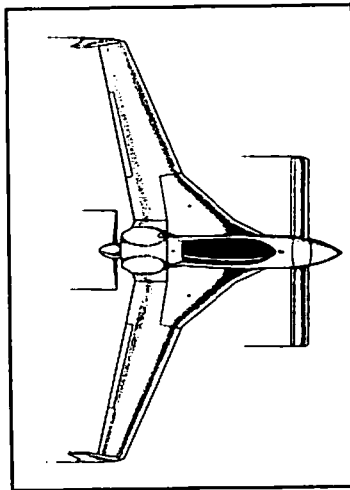
understand what was going on before I trucked another bag of money to Santa Paula for a replacement prop. So I removed the bee's butt spinner and damaged prop and put back on an old Hendrickson prop with a skull cap spinner. I added temperature sensing strips where the exhaust hit the prop and did a survey at a series of different prop clock positions. The data: I thought the heat of the exhaust as it reaches the prop must be

greatest about the time the exhaust value opens so I concentrated on two positions: (see photos)

I found the temperature was 220 degrees F in position A (top photo) and 144 degrees F in B (bottom photo) — 76 degrees F cooler!

The conclusion is rather simple: if you do not have to hand-prop, clocking the prop so the blades are just past the pipes as the exhaust valve opens, results in significantly cooler temperatures at the prop.

My second beer is now gone, Sid Stiber just left the pool, and it is time to change clothes for the banquet — I will stop all this. I remain convinced the need for speed is good — it makes all our planes better, helps the economy, and constantly reminds us (or at least me) that there is much more to learn. Fly safe. ●



Reader Mail



Dear RAF,

VariEze C-GRDN, No. 748 has flown 730 hours over the past 12 years and the "spats" (wheel fairings) are still here in the basement waiting for me to fit them!

After flying in England and over North America for the past 30 years with a map, rules and my watch for navigation, I finally broke down and bought a Garmin 90 last November.

This is cheating isn't it — it's not *real* flying. In 1966 I spent my time trying to stop my map shredding in the windy cockpit of Tiger Moth GALBD and now I sit in a plane made from two rolls of woven glass fiber and watch a moving map!

Our best wishes to you from the temperate Northwest.

Gordon & Hanne Hindle

Dear RAF,

Count me among the small group of people who have first-flown a Defiant. After 17 high speed taxi test runs building up speed to 75 knots on the runway, I decided I had done enough tweaking and adjusting and checking and finding reasons why the aircraft was not quite ready to fly.

N138EZ (138 is the serial number assigned by RAF, EZ because it is a "Big EZ") has been at the airport for more than a year, with flood, family and job keeping me from flying it sooner. The only major deviation from plans I made was to use a 4000 foot runway for flight test. Big mistake — don't do it — no way! Not being able to fly in ground effect adds a significant risk that cannot be justified by factors like shorter commute time and lower hangar rent. After realizing I had made a poor choice I tried to compensate by making sure the airplane was straight, but after about 10 high speed taxi tests I figured out that I couldn't tell if I had a heavy wing with the wheels on the ground. I had been doing the testing without hearing protection — my airplane seems very quiet compared to my Long — and I got used to listening to the main gear pins popping and crackling in their sleeves (does everyone's do this?) and the different but normal twin engine sounds.

THE SPIRIT OF EAA OSHKOSH

BANK CHECK ASSORTMENT

For a pilot, Christmas comes in late July — it's called "OSHKOSH". You can have that "Oshkosh Spirit" all year with these exclusive bank checks featuring award winning aviation photography from EAA Oshkosh.

EAA Oshkosh Ass't — New from '95 1937 Bucker Jungmeister, 'Plans Built' Cozy, Spirit of St. Louis, plus Beech Stag, Mooney Mite, Glasair III, 59 Comanche, 72 Cessna 172, 41 Taylor Craft, North American SNJ, 'Fifi', world's last flying B-29 and Burt Rutan's Voyager.

EAA Warbirds Ass't — New from '95 North American B-25J Mitchell, USMC Harrier — plus NA SNJ, B-29, P-40, P-47, B-17 & P-51, F-86 and Corsair.

TO ORDER CHECKS NOW — PLEASE ENCLOSE:

1. A voided sample check with all changes clearly marked.
2. A deposit slip.
3. The order form completely filled out.
4. A check payable to Identity Check Printers (US Funds Only)

STARTING NO. <input type="text"/> (If not specified, we will start checks at 1001)	
SINGLE CHECKS <input type="checkbox"/> 200 — \$12.95	<input type="checkbox"/> 400 — \$22.95
OR	
DUPLICATES <input type="checkbox"/> 150 — \$18.00	<input type="checkbox"/> 300 — \$26.50
ENTER AMOUNT FOR CHECKS	
SHIPPING & HANDLING	\$1.00
<input type="checkbox"/> FIRST CLASS MAIL, ADD \$3.50	
<input type="checkbox"/> UPS 2ND DAY AIR, ADD \$5.75	
<input type="checkbox"/> CUSTOM EAA SILVER WINGS CHECKBOOK COVER, ADD \$5.00	
<input type="checkbox"/> Script Lettering, Add \$2.00	
TOTAL	

NAME
Daytime phone number: ()

For your protection checks will be shipped to the printed address unless we are instructed otherwise (USA Delivery ONLY) CP-83
Checks are printed in full color and are top bound. One part deposit slips and check register are included in each order.

IDENTITY CHECK PRINTERS **24HR VOICE MAIL 312-992-0890**
BOX 818, PARK RIDGE, IL 60068 Call for info on our complete check line.

The test card called for

- (1). accelerate to the desired indicated airspeed
- (2). cycle the stick
- (3). chop throttle and max brake to stop in remaining runway

Why was it not trying to fly off at 75 knots? I got out my old newsletters and read that the Defiant has to overcome the inertia of an engine on each end so the nose won't pop up like my Long-EZ at 60 knots. On this airplane you put in a control input and then you wait.

That is the one thing I could not do on a 3800 foot runway. The next and final run I noticed a sound I had been overlooking. At about 65 knots and full aft stick I could hear the nose wheel bearings unload as the weight started coming off of the wheel. (I told you I had a quiet cabin!) So the next run I flew it around the pattern with the family looking on and me in my nomex suit and cotton underwear (I may be crazy, but not stupid).

How many times have you heard "it flew hands-off on the first flight"? What that really means is that when the airplane starts flying funny, take your number nines off the rudder pedals — this airplane wants to fly straight and level. A no-radio Sonerai homebuilt had departed ahead of me on runway 18 and when I turned final for 18 I saw the Sonerai on short final for 36, so I had to go around on my first flight. Otherwise it was a non-event.

Bottom line: the 8 years of building is over. Now the fun starts!

John Toelaer

ED. COMMENT — Congrats John, hope to see you at Oshkosh

through the giant hangar doors, the rough Boomerang fuselage sat propped forlornly upon jacks in a dark corner, its skin coated with a rough primer, its unpolished tail feathers stored on a shelf, its long forward-swept wings covered with dust. The engines were mounted, but untested; the cowlings were built, but unused; and the beautiful McCauley props were ready, but still packed in the box.

"We can do this," Burt told himself on Memorial Day. "We are going to fly the Boomerang to Oshkosh."

Three Weeks Later. Boomerang crew members and volunteers had set to work at a feverish pace, sanding, wiring, testing parts and making new lay-ups. Burt, Roger Houghton, Mike Melvill and Steve Losey worked 'round the clock. Dick Rutan volunteered for engine detail. Seamstress Carol Hooper made temporary cushions for the seats. Tonya brought lunch in paper bags and dinner in Tupperware containers. Everybody helped paint.

On June 17, Burt's birthday and just three weeks after Burt had determined to fly the Boomerang to Oshkosh, the airplane was ready for roll out.

The airplane was a lovely sight in the light of day despite its odd appearance. Artist Dan Kreigh had enhanced the white paint job with gray and burgundy pinstripes and an unique boomerang logo. The fuselages looked like two dolphins, a mother and a calf swimming side-by-side, connected by a wing spar and a tail boom.

Mike sat in the right seat, the pilot's seat in this airplane, with Burt in the left, monitoring instruments. After initial engine run-ups and taxi and brake tests the Boomerang was out on the runway to conduct a series of successful high speed taxi tests with altitudes as high as 10 feet. All systems performed as required, including the gear, despite gusting 35 kt winds.

Disaster strikes on June 19

— The Boomerang took-off on its first flight late Wednesday morning with Mike Melvill at the controls and

Burt on instruments. Test pilot Doug Shane and Dick Rutan flew chase.

According to Mike, the aircraft flew adequately despite a labored climb to 5000 feet. A decision had been made earlier to fly the pattern gear-down, which greatly reduced the airplane's climb rate. In addition, the left engine oil temperature shot up rapidly past redline soon after take-off. After seven or eight minutes Mike caged the engine and turned for a precautionary landing at Mojave.

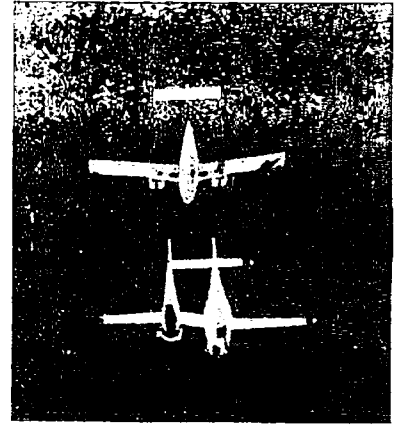
They say "no-one knows what the unexpected will bring." Mike's perfect touchdown was suddenly sabotaged by the unexpected retraction of the left main gear. Mike managed to shut off the fuel and keep the aircraft on centerline until the right brake faded. With boom and wingtip dragging, the airplane left the runway at about 40 kts. An embankment and concrete block removed the nose gear and right gear, and the Boomerang came to rest on its belly in the dirt. Fortunately neither Mike or Burt were hurt. The Boomerang, however, was a mess. Gaping holes tore across its three gear compartments. The cowlings were damaged and worst of all, the beautiful McCauley propellers were bent back like flower petals.

It took nearly 30 guys and a crane to lift the wrecked airplane onto a flatbed truck. Burt ordered it to be driven and parked in a hangar at the far edge of the Mojave airport, where no doubt dust would gather across its wings once more.

"Hey, you can't take it to that hangar," SCI engineer Cory Bird told Burt, "there's no air conditioning. We won't be able to work on it."

Burt said later that he realized Cory was right. He had to get back on the horse again, despite his disappointment. The Boomerang was driven back to the SCI hangar for repair.

Burt soon determined that the damage was indeed fixable. The non-steerable nose gear and right main gear were destroyed, as were both props. While the cowls and left wingtip received light damage, the majority of the fuselage structure held its integrity. Dick took the engines apart and found that both



crankshafts had come through clean. Interestingly enough, the left gear, the culprit cause of the failure, rode through the accident totally unharmed.

The Boomerang crew went back to work.

Three weeks and four days later the Boomerang flew again. Dick disassembled the Lycoming engine and found that the oil cooler had been inoperational during that first flight. Meanwhile Burt and crew redesigned and installed a new, more simple, gear assembly.

With the two fixes, the Boomerang's second, third, fourth and fifth flights proved extremely successful. The aircraft flew for more than an hour each flight over the Mojave Airport while Melvill and Rutan conducted initial flight testing. Both Mike and Burt were enthusiastic over the aircraft's flight qualities. "It flies unbelievably straight," Mike said. "The pitch/roll harmony is identical in all directions — that's your dream as a test pilot. You never expect to get it, especially at the first crack out of the box, but this time Burt has hit the ultimate goal."

Burt's latest light twin design may prove to be not only a new configuration, but perhaps the new shape of things to come.

Burt & Dick's 1996 Oshkosh Schedule

1 August — Thursday — 6:30 PM	Dick Rutan — <i>A Gathering of Young Eagles</i> Eagle Hangar at Museum
2 August — Friday — 9:30 AM	Dick Rutan — <i>Vietnam Vets Forum</i> West Ramp
2 August — Friday — 10 AM	Burt Rutan & John Roncz <i>"Life, the Universe and Everything Else"</i> Tent #3
2 August — Friday — 11:30 AM	Dick Rutan — <i>Voyager Lecture</i> Voyager Exhibit, Museum
3 August — Saturday — 8:30 AM	Burt Rutan — <i>"Tomorrow's Light Plane"</i> Tent #2
3 August — Saturday — 10:00 AM	Burt Rutan — <i>"VariEze, Long-EZ, Defiant"</i> Tent #3
3 August — Saturday — 11:00 AM	Dick Rutan — <i>Voyager Lecture</i> Voyager Exhibit, Museum
3 August — Saturday — 1:00 PM	Dick Rutan — <i>Vietnam Vets Forum</i> West Ramp
3 August — Saturday — 2:00 PM	Dick Rutan — <i>Press Conference</i> Press Headquarters
3 August — Saturday — 8:20 PM	Burt Rutan <i>EAA Freedom of Flight Award</i> Theater in the Woods
3 August — Saturday — 9:05 PM	Dick Rutan — <i>Tribute to Vets Program</i> Theater in the Woods
4 August — Sunday — 10:00 AM	Burt Rutan & John Roncz <i>"Tent Talk Show"</i> Tent #3
4 August — Sunday — 11:30 AM	Dick Rutan — <i>Dick Rutan Forum</i> Tent #3
4 August — Sunday — 1:45 PM	Dick Rutan — <i>Vietnam Vets Forum</i> West Ramp
5 August — Monday — 11:35 AM	Dick Rutan — <i>Voyager Lecture</i> Voyager Exhibit, Museum
5 August — Monday — 2:00 PM	Dick Rutan — <i>Vietnam Vets Forum</i> West Ramp
6 August — Tuesday — 12 Noon	Dick Rutan — <i>Vietnam Vets Forum</i> West Ramp

Bull Sessions
with Mike Melvill
are scheduled
August 1- 4
under the
Boomerang
wings at 1300

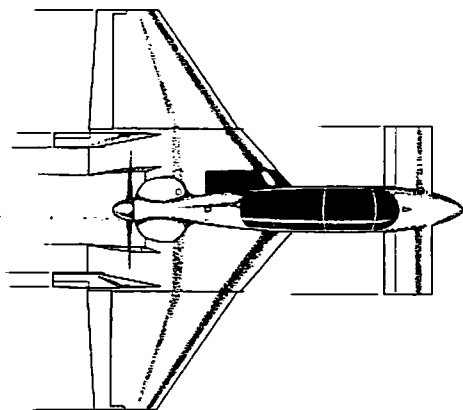
Fly-In with friends



Oshkosh '96 August 1 - August 7 Oshkosh, WI

Call (414) 426-4800 for Convention information
(414) 235-3007 for housing information
EAA
PO Box 3086
Oshkosh, WI 54903-3086

VariViggen Enthusiasts Oshkosh Special



Viggen champions Ron & Pam Smith are organizing a banquet for builders and enthusiasts of the VariViggen on Friday, August 2 at the American Legion on the Lake. Tickets cost \$8.95 per person. Send your checks to Builders Banquet, Joe Scheibinger, N9126 Lakeshore Drive, Van Dyne, WI 54979 or call (414) 929-9598. You will receive tickets & directions by mail.

If you are planning to fly your Viggen into Oshkosh, let Joe Scheibinger know NOW. He is planning a special parking spot for Viggen pilots.

Joe is also planning a parking spot for campers as well. Viggen enthusiasts planning to camp out at EAA with motor homes and tents has been invited to plug-in at Scheibinger's home for free. Give Joe a call for more info.

Mesquite Sprints August 31 - September 2 Mesquite, Nevada

Contact Virgin River Resort & Casino
for R.A.C.E. reservations
(800- 346-7721)



Eagle Swoop Eagle Roost, AZ October 5 - 6

This new race event will feature a camp out and steak fry social on Saturday night (Oct 5) at Shirl Dickey's hangar. Steaks, ect and eating utensils will be available for about \$10 each. Bring tents and sleeping bags. Bathroom facilities available. For those who want to motel it, contact Americinn Motel at (520) 684-5461 or Best Western at (520) 684-5445. Both motels are located in Wickenburg, AZ.

The race course will be a 95-mile triangular race starting at Eagle Roost to Buckeye VOR (BXX) to Wickenburg airport and returning to Eagle Roost for the finish. Pilots Meeting at 7:00 am Sunday morning, with awards presented at the end of the day's events.

The Fox Hunt, Fox Field Lancaster, CA November 1, 2 & 3

This will be a 2-lap race in conjunction with a regional fly-in. We have been invited to provide air racing events to include a class of Formula One racers. The race course has not yet been established but will be consistent with previous course lay-outs that maximize safety and fun. Formula One racers will race a shorter course with an air start and will adhere to all other established R.A.C.E. safety procedures.

Norm Howell and EAA chapter 1000 are supporting us in coordinating this event. Contact Shirl Dickey (520) 427-6384, or Norm Howell (805) 256-1643 for hotel accommodations.

MOLDED VORTEX GENERATORS

These pre-molded generators are specially engineered for aircraft application. Available in white, they can also be custom molded in quantity to match specific paint colors for aircraft manufacturers and OEM suppliers. After installation, the sail appears to be molded an integral part, rather than an "add-on". The final result not only looks better, it performs better than typical hand-made aluminum fences. Molded vortex generators adhere better, do not corrode, require no painting and are easy to install: one Long-EZ canard can be equipped with a full span of generators in less than 90 minutes.

A kit containing fifty generators is available for a price of \$25.00 plus \$2.00 shipping and handling per kit. Two kits are sufficient to equip the full span of a typical canard (i.e. Long-EZ, Dragon-Fly, et al) or both ailerons on either canard or conventional planforms. Documentation is included. Please send check or money order to:

CCI, PO Box 607, Plainfield, NJ 07061-2318
Please allow 2-3 weeks for delivery, Sorry, no COD's.
For more information 6:00-10:00pm EST, Mon.-Fri.
908-757-9573 908-755-9639 FAX

Note: These vortex generators are not TSO'd for use on type-certificated aircraft.



STARTER FOR 0-200 CONTINENTALS

B&C Specialty has introduced a beautifully made, 12 volt starter specifically designed to be installed into the accessory housing on a Continental 0-200 engine, or on an 0-240.

This starter has been thoroughly tested at Teledyne Continental (more than 5000 start cycles without a single problem!).

Bill Bainbridge has these starters available for immediate delivery and they can be had STC'd or for homebuilts.

Contact: B&C Specialty Products, Inc.
123 East 4th Street, Newton, KS 67114
316-283-8662

F-16 DEEP STALL INCIDENT VIDEO

Gives a pilot's-eye view of a deep stall which almost doesn't recover. Includes a letter describing what the important learning points are from the video, especially as they apply to EZ pilots who are unfamiliar with deep stall, as well as a transcript of the audio portion (for clarity). Price - \$13.00.

Contact: Charlie Precourt
7015 Little Redwood Dr.
Pasadena, TX 77505-4433

RAF Recommended Suppliers

These suppliers are still the only authorized RAF dealers for all your various aircraft materials and components.

Aircraft Spruce
PO Box 424
Fullerton, Ca 92632
(714) 870-7551

Brock Mfg.
11852 Western Ave
Stanton, Ca 90680
(714) 898-4366

Feather Lite
PO Box 781
Boonville, Ca 95415
(707) 895-2718

Wicks Aircraft
410 Pine Street
Highland, IL 62249
(618) 654-7447

Prop Manufacturer
600 Superior St
Concrete, Wa 98237
(206) 853-8947



FLUSH, INTERNALLY MOUNTED ANTENNAS

A complete line of antennas, specifically designed for, and flight tested on, composite aircraft. The antennas are tuned for maximum performance and in general those who have used them so far report reception is doubled over standard external antennas.

VariEze builder/flyer Bill Butters has started a company to develop a full range of buried antennas. These are normally supplied with a BNC connector built into the actual antenna, but can be supplied without connectors to include enough length of co-ax cable to facilitate easy installation with minimum weight and bulk.

Call Bill Butters, Advanced Aircraft Electronics, PO Box 4111, Florissant, MO 63032
800-758-8632

TITANIUM ACCESSORIES AVAILABLE!

Custom anodized to any of 15 different colors, shades of copper, purples, blues, greens, yellow/gold, even rainbow effect. Rudder and aileron gustlocks - \$20.00-30.00.

GU canard full span vortex generators with layout template - \$170.00. These are very exciting! Rudder horn CS-301L&R replacements, \$25/pair. Shipping inc.

Ti Specialties, PO Box 1052
Grover Beach, CA 93483-1052
805-489-8155

Feather Lite



LONG-EZ PARTS PRICE LIST

Main gear strut	\$349.00	
Nose gear strut	\$58.00	
Engine cowls, pr. (glass)	\$329.00	
Engine cowls, pr. (Kevlar)	\$480.00	
Cowl inlet	\$48.00	
Wheel pants (3.5x5)	\$150.00	
Wheel pants (500x5)	\$180.00	
Above item in Kevlar	\$215.00	
NG 30 cover	\$21.00	
Pre-cut canard cores	\$160.00	
Pre-cut wing & winglets		\$1199.00
Leading edge fuel strakes w/bulkheads		\$524.00
Strut cover SC	\$19.50	
Nose wheel cover NB	\$19.50	
Sump blister	\$19.50	
NACA inlet	\$47.00	
3" extended nose gear	\$70.00	

Feather Lite, Inc. is proud to announce another product to re-introduce to EZ builders: The original Space Saver Panel by the late Rusty Foster. This is a bare fiberglass panel with a molded recess for builder installation of an aluminum flat stock electrical panel. \$40.00

Contact Michael Dilley or Larry Lombard (both former RAF employees and EZ builders and flyers)

Feather Lite, Inc., PO Box 781
Boonville, CA 95415
707-895-2718

NOSE GEAR RATCHET

Dr. Curtis Smith's nose gear crank ratchet is available for \$40.00 which includes postage and packaging. No need to call, just send check or money order. This little device should be considered a "must" by all Long-EZ and VariEze builder/flyers. Once you have flown with it you will wonder how you ever did without it.

Curtis Smith, 1846 Sextant Dr.
Worden, IL 62097

Note new phone # 618-656-8209



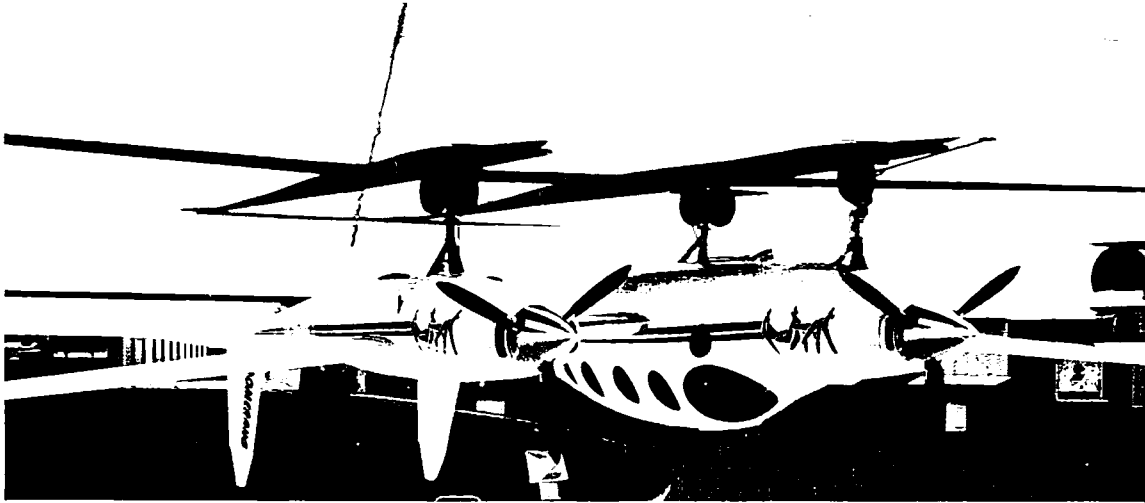
NOSE WHEEL SHIMMY DAMPER PLANS

Because of rising costs Bob Davenport tells us he will no longer sell the nosewheel shimmy damper kit.

However, all production information, drawings, and installation procedure were published in the April 1995 Vol. 38 edition of the Central States Newsletter.

Contact: Central States Newsletter
9283 Lindbergh Blvd
Olmsted Falls, OH 44138-2407

The Boomerang, Burt's newest five-place twin makes it's maiden flight



RUTAN AIRCRAFT FACTORY
1654 Flight Line
Mojave, CA 93501

Bulk Rate
U.S. Postage
PAID
Permit No. 75
Mojave, CA
93501

Inside

The Boomerang flies!	Pg 1
RAF CD-ROM debuts	Pg 3
Reflections on exhaust & props	Pg 4
Reader mail	Pg 6
Burt & Dick's Oshkosh Schedule	Pg 8

87* LAST CP IS 99
SCHUBERT, TERRY *
9283 LINDBERG

OLMSTED FALLS OH
44138

July 96
CP 85

If your label says LAST ISSUE CP 85, this is your last issue and you need to renew.

