The Cleco

Experimental Aircraft Association • Chapter 393 • Concord, CA

Mail to: EAA Chapter 393 P.O. Box 272725 Concord, CA 94527-2725

APRIL 1995

YOUR 1995 OFFICERS

PRESIDENT	Fred Egli 935-7551
VICE PRESIDENT	Lisle Knight 527-6846
SEC/TREASURER	Louis Goodell 682-4198
EDITORS	Ken & Linda McKenzie 283-3119

MEMBERSHIP MEETING

April 26, 1995, (the 4th Wednesday of every month) @ 7:30pm, Old Buchanan Terminal Building, Concord Airport. Please wear your badges to help those of us who don't know everyone. Also, please bring chairs — we never seem to have enough.

BOARD MEETING

The board meeting is scheduled for 7:30 p.m., Wednesday, May 3 at Fred Egli's house. If you are interested in attending or have a matter you wish to discuss, please call any of the Chapter Officers.

MINUTES OF THE CHAPTER MEETING
held March 22, 1995

The meeting was called to order at 1930 hours, Fred Egli presiding. The minutes of the February meeting were approved as submitted in the March 1995 Cleco.

The Golden West Regional Fly-In at Tracy will be held in early October. The coordinating committee is asking for $100 seed money since last year's Fly-In was a flop due to weather. A motion was seconded and approved by the members to put up the requested funds.

The 1995 Christmas Party / Awards Dinner will be held at Petar's on Sunday, December 17.

Lisle suggested that the chapter purchase an inexpensive VCR. Jeff Culver offered to donate one that he thought would need minor repairs.

The chapter will have its own cordoned-off display area at the June 18 Airport Open House. Gerry would like us to man the Young Eagles booth/table again this year.

Gordon Bowen announced that Hexcel is again sponsoring the composite workshop at Oshkosh. If you are going to be attending this year and can volunteer two hours of your time, please contact Gordon as soon as possible.

WELCOME NEW MEMBERS

We had five new members join at the March meeting. Roger Raley, Dennis Romano, Mark Madden, Steve Fox and Valerie Knight.

MINUTES OF THE BOARD MEETINGS

The board met for its monthly meeting on Wednesday, March 29 at Fred Egli's house. In attendance were Fred Egli, Lisle and Valerie Knight, Louis Goodell, and Ken and Linda McKenzie.

Following up on the desire to have a projection screen installed, Fred spoke with Tracy, who asked us to find out exactly how much one would cost. The estimated price is approximately $100. The county would be willing to purchase and install this screen.

It was also suggested that we acquire a display case for the Chapter Charter. Louis Goodell has offered to make one for the cost of the materials.

We have received the EAA Chapter banner. and are now investigating getting a decal with the Chapter # attached.

It was decided that the March issue of the Cleco would be the last issue received by members who have not paid their dues for 1995.

AEROBATICS PRACTICE SESSION
APRIL 29th SHORT TRIP TO TRACY AND BACK

Members of Chapter #393 are cordially invited to attend a critique and practice session of aerobatics by the International Aerobatics Club, Chapter #38 on Saturday, April 29th.

Chapter #38 will have catered food for 50 persons. It will be $7.00 per person for hamburgers, hot dogs, salad and sodas. So RSVP to Dick Rihn **ASAP** (510) 938-4236 and you will receive a ticket to reserve your spot. (Or bring your own lunch). If you fly-in, get briefed for safety.

Briefing at 9:00am will be in the parking lot East of the CCR tower. For your safety it is VERY advisable. Serious aerobatics critiquing will probably begin at around 10:30am. The aerobatics zone (hot box) is located immediately East of Tracy airport and between runways 25 and 29. All approaches must be made from the West and Southwest. Runway 25 will be closed. Unicom radio will assist in providing information and will attempt to warn aerobatics aircraft of intruders. Remember aerobatics pilots don't look where they are going! Most pilots do not anticipate traffic on a collision course coming straight up or straight down either. The potential exists to ruin a fine day. So be careful; get briefed.

WHAT IT ISN'T

It is not an air show. There will be no low level Jimmy Franklin style aerobatics. There will not be a clown act. No one will fly under a string on poles, etc. There will not be a car to plane transfer and absolutely no wing walking. There will be no parachute jumps or air races.

WHAT IT IS

There will be an announcer explaining the intricacies of the aerocryptographic annotation, the figures being flown, how they are judged and all about a safe and addicting sport. If there is sufficient interest we may obtain two Pitts two place (260 hp) aircraft and one immaculate stock Stearman for barnstorming rides. You pay, you fly. Due to insurance constraints you will not be able to loop, spin and roll in front of your sweetie in the IAC aerobatics box. But, you won't have to go too far to get into class G airspace. You will observe the members of Chapter #38 doing their usual week-end fly and critique session. You will hear the critiquer judging them and giving them clues on improved presentation. These taped remarks will be studied by the pilot after each flight. The pilots will continually attempt to upgrade competition skills. Between flights the aircraft will be on static display in a secured area.

This should be an unexciting, undemanding experience. A nice relaxed day in the sun with guaranteed weather forecasting (what you see is what you get) and fool-proof navaids (Mt. Diablo). Come and meet some nice people who work seriously at becoming more proficient pilots.

APRIL PROGRAM

This month's program will be video tapes of our members current projects.

Lisle

TREASURER'S REPORT FOR 1994

Revenues:	
Dues	$2,135.00
Ads	70.00
Raffles	177.00
Miscellaneous (Jacks)	16.00
Total Revenues	$2,398.00
Expenses:	
Newsletter - printing	$926.29
Postage	410.00
Tracy Fly-In	250.00
Badges	247.76
Insurance ('94 & '95)	151.00
Speaker Fees/Expenses	146.20
Photography Development	105.47
'93 Christmas Dinner Raffle Prize (Wayne Handley)	100.00
Office Supplies	86.98
July '94 Picnic expenses	75.00
P.O. Box Rental	35.00
Total Expenses	$2,533.70
Operating Deficit	$ 135.70
1994 Christmas Dinner:	
Dinner Tickets Sold @ $20 each	$1,360.00
Restaurant Charges	1,488.00
Miscellaneous Expenses	45.55
Deficit	$ 173.55
Recap of Checking Account:	
Beginning Balance 1/14/94	52.96
Revenues	$2,398.00
Transfer from Savings 1/14/94	300.00
Transfer from Savings 12/19/94	300.00
Expenses	(2,533.70)
Christmas Dinner Deficit	(173.55)
Ending Balance 12/31/94	$ 343.71
Recap of Savings Account:	
Beginning Balance 1/14/94	$2,952.33
Interest Income	69.87
Services Charges	(10.00)
Wayne Handley	(100.00)
Transfers to Checking	(600.00)
Ending Balance 12/31/94	$2,312.20

Stoddard-Hamilton's New GlaStar

On the afternoon of Friday, March 31, the GlaStar was on display on the East Ramp of CCR. Since Ken and I are still looking for a project I planned to leave the office no later than 3:30. Well, so much for planning; I managed to finally leave San Francisco at 4:30 and drove as fast as traffic would permit, hoping that I would get to Concord before the GlaStar left.

When I arrived, the plane was in the air on a demo ride. I was amazed to see how many people had come out to see it. When the plane landed and taxied back to the end of Lyle's hangar row, a crowd formed around the GlaStar. Ken wanted to show me the mechanism that allows the wings to be easily folded back. In addition, he suggested that I take a look inside the cabin, to see how nicely the seating accommodated both small and large pilots.

Thanks to Lyle Powell, I not only got to poke around in the plane, I got to fly it. This plane was a novice's dream. Since I am not current, I was a little reluctant to take complete control of the plane. Well, I shouldn't have worried. Everything about the way the GlaStar handled was enjoyable. Taxiing was easy. It jumped off the runway before it was asked. Climb out was nice. The windows in the top of the canopy allowed for visibility when turning that I had not experienced in a high-winged plane. I was most impressed with how gently it stalls. Anyway, when I returned to the airport (I will never no whether the landing was all mine or not) I was ready to sell the car in order to buy the kit.

Thanks again Lyle, I really loved flying the GlaStar. I think that this may just be the perfect first project.

Linda McKenzie

Do You Know These People?

As of March 27, 1995, the following people had not paid their 1995 dues and are no longer receiving The Cleco.

Lynn Axelson
Gary Aldridge
Blaine Banks
Don Best
Ronald Caldwell
Jordan Coonrad
Debbie D'Amico
Chris Hill
Steve Marcica
Gloria Martin
Pete Mitchell
Randy Moore
Marie Lisce Pahtaras
Russel Porterfield
Rich Powell
Ron Richman
Francisc Rolfson
Kay Smith
Bill Stauffer
Eric Sweet
Peter Todebush
Edward Townley
Larry Welter
James Wilhelm
Ryan Young

UNCLASSIFIEDS

FOR SALE ⅓ interest in Varieze: 2 partners looking for a third to provide sweat equity and some cash and to contribute to other completion costs for a very nice Varieze at CCR. Completed to point of taxiing. Call Jim -- days 675-4312 or nights 820-2586, Chris -- days (707) 523-5135 or nights 798-8844 for additional details. [2/95]

FOR RENT: Hangar space is available in one of the West Ramp Port-to-Port for building a kit. Contact Barry Burgess, 118 West MacDonald Ave., Richmond, CA 94801. Home (510) 215-2991; Work (510) 532-5242. [2/95]

FOR SALE: Q-235 project. Nearly finished. Lycoming o-235 w/327 SMOH. No medical. Call Quentin Durham at (510) 254-7843 for specs and photos. [3/95]

FOR SALE: Third interest in Questair Venture, 80% complete. Project currently in Orinda. Asking price for interest $40 to $45K. Call Terry Thies at 254-7508. [3/95]

Calendar of Events

Chapter Events

July 15 - Annual Picnic held on the lawn next to Navajo Aviation.

Dec 17 - Annual Awards Dinner @ Petar's Restaurant in Lafayette.

Workshops

May 27-28 - SYRACUSE, NY - Alexander Aeroplane's Builders' Workshop. 1-800-831-2949.

June 5 - July 1 - OTTUMWA, IA - 16th Annual Composite A/C Const. Workshop. 800-726-2585, ext 183.

June 10-11 - COLUMBUS, OH - Alexander Aeroplane's Builders' Workshop. 1-800-831-2949.

June 24 - 25 - GREELEY, CO - Alexander Aeroplane's Builders' Workshop. 1-800-831-2949.

Fly-ins & Airshows

April 22-21 - MESA, AZ - Sundance Air Derby. 602-641-7549.

April 22-23 - Minter Field Warbirds in Action. Minter Field, Shafter Airport, CA 805-393-0291.

April 28 - Aviation Career Day @ Buchanan Field. 10:00am-1:00pm.

April 30 - HALF MOON BAY, CA - Pacific Coast Dream Machines, 10am to 4pm. 415-726-2328.

May 5-6 - OROVILLE, CA - Airport Rededication & Air Fair. Highlights include: displays, exhibits, fly-bys & airplane rides 1pm to 6pm Fri & 10am to 6pm Sat. No host social, BBQ dinner & dancing Fri evening. EAA chapters 427 & 735 hosted pancake breakfast 8am to 11am Sat. For info call 916-538-2433.

May 18-21 - HAYWARD, CA - Hayward-Los Vegas Air Race. 408-636-1116.

May 20 - CORNING, CA - Antique Fly-in and Airshow.

May 20 - GEORGETOWN, CA - Fly-in Picnic

May 20 - McClellan AFB Guest Day.

May 20 - ROSAMOND SKYPARK, CA - EAA Chapters 49/1000 3rd Annual Fly-in. Includes pancake breakfast and BBQ lunch. 805-538-1530.

May 20-21 - CHESTERFIELD, MO - 3rd Annual BD-5 Convention. 314-349-4828.

May 26-28 - WATSONVILLE, CA - 31st Annual W. Coast Antique Fly-in/Airshow. 408-496-9559.

May 26-28 - HAYWARD, CA - Hayward Air Fair.

May 26-28 - LONGMONT, CO - IAC Chapter 12 Regional Contest. 303-493-7507.

June 1-4 - PHOENIX, AZ - Southwest Regional Aviation Expo '95. 602-821-0294.

June 2-4 - MERCED, CA - 38th Annual Merced West Coast Antique Fly-in. 209-358-3728.

June 3-4 - DURANGO, CO - Four Corners Air show. 303-247-2740.

June 9-10 - PORTERVILLE, CA - 45th Annual Moonlite Fly-in/Airshow. 209-535-4510.

June 9-11 - SAN DIEGO, CA - CAF Regional Airshow. Brown Field. 619-469-9651.

June 10 - INTERNATIONAL YOUNG EAGLES DAY

June 11 - SACRAMENTO, CA - Annual Air Fair / Fly-Swap @ Sacramento Executive Airport. 916-429-33793.

June 16-18 - CAMARILLO, CA - EAA Chapter 723 15th Annual Fly-in featuring the Southern California Wing of the Confederate Airforce. 805-388-9665.

June 17-18 - COLUMBIA, CA - Fly-in. 209-536-9805.

June 18 - CONCORD, CA - Buchanan Field Airport Open House. 10:00am to 4:00pm.

June 23-25 - COLUMBIA, CA - 20th Annual SW Stinson Club Fly-in. 510-686-3812.

June 23-25 - LONGMONT, CO - 17th Annual EAA Rocky Mountain Regional Fly-in/Airshow. 303-798-6086.

June 30-July 2 - SEATTLE, WA - Museum of Flight Flightfest '95. 206-764-5720.

July 5-9 - ARLINGTON, WA - 26th Annual North-west EAA Fly-in / Sport Aviation Convention. 360-435-5857.

July 7-9 - LOMPOC, CA - 11th Annual Piper Cub Fly-in. 805-733-1914.

July 15 - VACAVILLE, CA - Solano Air Fair. 707-466-0322.

July 16-20 - SPOKANE, WA - American Bonanza Society Annual Convention. 706-290-0792.

July 18-23 - OSHKOSH, WI - 380th Bomb Group Reunion. 501-362-2891.

July 22 - SUSANVILLE, CA - Susanville Airfaire. 916-257-0334.

July 27-Aug 2 - OSHKOSH, WI - 43rd Annual EAA Fly-in -and Sport Aviation Convention. Wittman Regional Airport. Contact John Burton, EAA, P.O. Box 3086, Oshkosh, WI 54903-3086, 414-426-4800.

Sept 14-17 - RENO, NV - '95 National Air Races.

Sept 29 - SAN JOSE, CA - Reid-Hillview Airport Day.

Sept 30 - PALO ALTO, CA - Palo Alto Airport Day.

Oct 12-15 - PHOENIX, AZ - Copperstate Regional Fly-in. 602-750-5480.

Oshkosk Travel Partners

Don Baldwin is planning to drive back again this year with his trailer. Anyone interested in spending two weeks for the trip should contact him now.

Bob Russell from Chapter 512, Placerville, would like to fly back in a light plane. Says he will share expenses and can help navigate. Call him at 916-642-1084.

As I was skimming through some of the other newsletters, I ran across the following article that was reprinted from the AOPA Pilot.

THE UNWARY GET TRAPPED

By John S. Yodice

The FAA and NTSB have once again teamed up to temporarily rid our skies of a particularly dangerous pilot, albeit at the cost of untold thousands of our taxpayer dollars. This particularly brave deed by these twin bureaucracies should be chronicled to the aviation world. It's important for taxpayers to know how their money is being spent.

The dastardly pilot, posing as a young executive with a large corporation back East, married with a three-year-old daughter, had learned to fly at a local FBO in 1980. Once he got his certificate, he began renting aircraft at that same FBO, happily pursuing his avocation, until 1987 when the FBO fell on hard times and went belly-up. That discouraged him. As he tells it, he "retired" from flying, never really intending to get back into it.

In 1992, one of his coworkers bought an interest in an airplane. The hangar flying at work rekindled his interest.

During his five years away from aviation, the FAA adopted FAR 61.15. This is the regulation which requires a pilot to notify the FAA of any "motor vehicle action" within 60 days of the action. It was adopted in July 1990. News of this new regulation didn't come to his attention because he wasn't following aviation. He was out of it. In fact, news of this regulation didn't sink in to many active pilots. After all, it is hard for many pilots to see the relation between driving infractions and flying.

Also, During his "retirement" from flying, he had a motor vehicle action. It was February 1992. He was attending a conference and seminar in Palm Springs, CA. Driving back from the banquet at which he had two cocktails and wine with dinner, he got lost. He turned the wrong way down a one-way street. He recognized it immediately and stopped, but not before being observed by a police officer. He was given a sobriety test. He measured .08 percent or more of alcohol in his blood, which is a misdemeanor under California law. He chose not to try to defend the case, especially from 3,000 miles away. He pleaded guilty in March 1992 and was given a suspended sentence.

His interest in flying was rekindled in June 1992. On the twenty-fifth of that month he visited a local aviation medical examiner who administered an FAA physical. The medical application form called for the disclosure of the traffic conviction, and he dutifully complied. The doctor informed him of the new regulation that required notification to the FAA in Oklahoma City. The medical application itself was going to the FAA in Oklahoma City. The doctor indicated that this would take care of the matter. The doctor didn't immediately issue him a medical certificate, probably because of the conviction, and referred the application to Oklahoma City. On review by the FAA in Oklahoma City, the conviction was obviously not a problem. Oklahoma City sent him a medical certificate on August 12, 1992. This confirmed to the pilot that he had met the regulatory requirement to notify the FAA. He started flying again.

The irony of this cannot be lost. It was the routine processing of the medical application form which disclosed the conviction that triggered a full-blown investigation. In November 1992, the pilot received a letter from a special agent of the FAA Civil Aviation Security Division. He responded to the letter: "When the incident occurred in March, I did not realize at the time that I needed to report the incident to the FAA. At the time, I was not actively involved in flying, and in fact did not even possess a current medical certificate...I did not become aware of my responsibilities until my medical application in June of 1992, at which time I assumed that reporting the incident on the extra sheet of my medical application would be sufficient. I would be perfectly willing to comply with any additional letter I need to write or form I need to fill out to correct any deficient paperwork/records, as it is very important to me to be able to continue exercising the privileges of my airman certificate. Please let me know how I can further cooperate."

The pilot's belief that this closed the matter was shattered when the file was referred to an FAA lawyer for prosecution. The pilot had an informal conference with the FAA lawyer. No deal. The notice was due in 60 days—May 29, 1992—and the medical application was not until June 25, 1992; 27 days too late. Besides, it went to the FAA medical division and not the FAA security division, as the regulations require. The FAA proposed to suspend his certificate for 30 days. His unblemished flying record would be besmirched.

He appealed the FAA order of suspension to the NTSB. A hearing was held. The pilot, representing himself, explained that he wasn't flying at the time, didn't even have a medical certificate, and didn't become aware of the requirement until he applied for a new medical certificate. Since he couldn't legally fly without a medical certificate, and didn't fly, his failure could not possibly have affected air safety, which is the standard before the Board. He insisted that he had no intent to evade the law. "I have the utmost respect for the rules and regulations of flying and follow them to the letter of the law."

The FAA said a news release about the requirement was sent to newspapers. None of the newspapers that serve the pilot's city were on the list. The FAA argued "that since the pilot remained a certificate holder, he had the obligation to be familiar with and comply with the FARs, irrespective of whether he was exercising the privileges of his airman certificate." The Board agreed. Ignorance of the law is not a defense. The Board predictably sustained its sister federal agency, holding that "safety in air commerce" requires affirmation of the 30-day suspension.

Perhaps we should all rest more comfortably knowing that the power and majesty of the United States Government spared no expense in making the skies safer by grounding another dangerous pilot.

Somehow, I don't feel that way.

ADS FROM THE INTERNET

Note: Ken will gladly make e-mail contact for anyone interested in responding to the following listings.

From: gpaint@ibm.net
Subject: FOR SALE: SUPER EMERAUDE
Date: 11 Apr 1995 04:49:07 GMT

Super Emeraude project for sale. Comes complete with Lycoming 0-290-G, special Ted Hendrickson prop, fiberglass cowling, built fuselage, flaps, ailerons, tailgroup, wing spar (one piece, also fittings for removable wings), all ribs built, landing gear, controls, hardware and cables. Just assemble and fly. Materials to finish included. $6500 obo/trades?

Jerry Painter
1521 Wetmore Ave.
Everett, WA 98201-2057 (20 mi. north of Seattle)
(206)258-4522
(206)388-3311 ext 2129

From: daniel@community.net (Daniel M. Jonas)
Subject: Glasair III (for sale)
Date: 7 Apr 1995 23:20:24 GMT

I have kits 1 & 2 of a Glasair III that are pretty much completed. Wing is ready for landing gear and then closing. Divorce may force sale. The aircraft is located in Napa, CA. I would be interested in an outright sale or joint venture. Perhaps someone could even tell me what it is worth. Call me at (707) 255-8494 days & (707) 255-3618 evenings. Daniel M. Jonas, 730 California Blvd, Napa, CA 94559

From: robinl@rain.org ()
Subject: Long EZ for sale
Date: 26 Mar 1995 19:58:33 GMT

150 HP O-320 with Light Speed Eng. CDI ignition system, ram air induction, remote oil filter, 300 hours since chrome overhaul, less than 500 hours TTAF, extended nose, electric dive brake, large rudders, lamb tires, LSE wheel fairings, TemperFoam seats, electric nose gear -EZ Lift, forward brake master cylinders, full IFR w/Narco MK 12D & glideslope, mode c, marker beacon, digital VOR, Apollo 604 database Loran, ELT, intercom, headsets, 12 volt electrical system, landing light, NAV lights, strobes, instrument panel lights, cockpit light, CHT for all 4 cylinders, fuel pressure, vacuum gage, dual electric fuel gauges, voltmeter/ammeter, vacuum and electric gyros, GU canard, B&T propeller, Brock spinner. Whew!

200 MPH @ 2800 RPM $36,000 firm.

Paul Lamar

From: chris@andy.hssc.scarolina.edu (Chris Elmore)
Subject: How much is Long EZ proj. worth?
Date: 1 Apr 1995 00:21:29 GMT

I'm not sure this is posting correctly...apologies if not. I have a Long EZ project that I'm trying to decide if I should keep or sell. I bought it several years ago and almost immediately became unemployed so I never got to finish it. Others who have built them tell me it's about a third complete. The fuselage is built from canard mount to firewall. The main spar and canard are also built (no control surfaces on the canard. I still have most of the foam and fiberglass that wasn't used.

All material has been stored indoors (ask my wife!) and I've kept it out of direct sunlight. What I would like to know is what would be a reasonable (buyer and seller both satisfied- if that's possible) price for it?

Please respond directly since I rarely get to this group. I can be reached at: chris@otis.hssc.scarolina.edu

Thanks,

C.

From: tdadcox@onramp.net (Tim Adcox)
Subject: COZY Project for Sale
Date: 16 Mar 1995 14:08:45 GMT

COZY project - Wicks complete materials kit with 450 manhours of manufacture. Project is at the "boat" stage. All foam(plus a bunch of extra blue foam), glass and fittings to complete. Engineer builder with details on the mind. $2,850 obo

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From: grizzly@eskimo.com (Douglas Weber)
Subject: Pitts Project For Sale
Date: Thu, 16 Mar 1995 18:11:15 GMT

FOR SALE

Pitts S1C project
Complete less flying wires
Assembled and Painted
2 engines, 1 is installed
Lyc O-290-G/D and Lyc O-320
Electrical system, metal prop, many extras

$14,500 USA or best offer

email for more info

From: angle1@aol.com (ANGLE1)
Subject: Glasair Project 4sale Tulsa
Date: 28 Mar 1995 22:15:24 -0500

Glasair I FT Project

Glasair I FT (fixed tri-gear) with many factory and builder upgrades. Fuselage, empennage, cowling, and wing assembled. With mid-time 160 HP Lycoming 320 engine with Bendix fuel injection system. Engine requires rebuild.

Autopilot servo and electric flaps actuator are installed in wing. MAC trim servo for elevator is included. Landing gear upgraded and includes Cleveland disk brakes and master cylinders with remote reservoir.

Extensive set of instruments and avionics to complete a comprehensive VFR panel.

Dynafocal engine mount installed in airframe. Engine has new alternator and fuel pump, yellow tagged magnetos. New Aymar Demuth wood prop and new fiberglass spinner.

Complete project for $32,500.

Please contact David
Home telephone 918.298.2816
Home fax 918.298.8034
AOL e-mail: ANGLE1

Private sale - no collect calls accepted.

From: bummer@whidbey.net (Kent Vandervelde)

From: Kirk Bocek <74736.3457@CompuServe.COM>
Subject: Builder Stories Wanted-AeroCrafter
Date: 24 Mar 1995 03:29:14 GMT

A brand new Third Edition of AeroCrafter, The Homebuilt Aircraft Sourcebook, will be published in June 95. Since successful completions are a great inspiration to those who are still dreaming and to the many people who have already started their project, we are looking for builder stories for our next edition.

We are especially interested in hearing from builders of any of the kits from the following manufacturers:

Barney Oldfield Aircraft	CGS Aviation
Dudley R. Kelly	Falconar Air Engineering
Fisher Flying Prod.	Fisher Aero Corp.
Flightworks Corp.	Gene Littner Merlin Aircraft
Great Plains Aircraft	Keuthan Aircraft Corp.
Kolb Co., Inc.	Lancair Intl.
Murphy Aircraft Mfg.	Questair, Inc.
Quicksilver Enterprises	Rand-Robinson Eng.
Rans Co.	Skystar Aircraft Corp.
Stoddard-Hamilton	Stolp Starduster

If you, or someone you know, is interested, please contact us as soon as possible. Contact us at:

aerocftr@baicorp.com
AeroCrafter, 940 Adams ST., Suite G, Benicia CA 94510
Benicia CA 94510

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Kirk Bocek

From: mdelevie@wam.umd.edu (Mark Y. deLevie)
Subject: Crashworthiness <very long>
Date: 11 Mar 1995 04:58:15 GMT

Hi, folks. This is a long one -- you have been warned. (and please don't repost the whole thing just to add a few comments at the end...)

Summary of presentation to EAA Chapter 4 (Washington D.C.) on Airplane Crashworthiness.

My purpose was to outline safety considerations in the structure and systems of small airplanes. I included a 16-page handout of diagrams and plagiarized (photocopied) illustrations. Unfortunately, these don't make very good ASCII pictures.

The objective of this effort is simply to reduce the chances of crash-induced injuries and fatalities. In my view, the survival of pilot and passengers is the single greatest concern; the airframe's survival is not necessary if the occupants can walk away from a crash.

The basic principles of crash survival in a vehicle are not new; Ralph Nader wrote of them in 1965 in his infamous book "Unsafe At Any Speed" (Grossman Publishers, NY). He quotes research from the late 50's:

"... The Cornell Aeronautical Laboratory, which became heir to ACIR in 1961, lists four general requirements for collision protection in a vehicle:

1) *a sound outer shell structure which will retain its structural integrity under impact -- and absorb as much energy as possible -- without allowing undue penetration of the striking object into the passenger compartment.*
2) *elimination from the interior surfaces of the shell any hard, sharp projections or edges and the prevention of vehicle components (such as steering columns and engines) from penetrating into the compartment.*
3) *the application of energy absorbing materials to reduce impact forces on the human body at all probable points of contact with these surfaces.*
4) *provision of passenger restraint systems, not necessarily restricted to seat belt devices, to prevent or minimize relative body motion and abrupt contact with the interior of the vehicle, at the same time inducing little or no physiological damage to the passenger due to the operation of these restraint systems.*

These Cornell criteria might seem to be based simply on common sense, but they are formulated on the basis of over 70,000 accident cases."

It's amazing how similar the considerations are between surviving a car crash and surviving an airplane crash. The progress in the last 35 years in automotive crashworthiness is instructive for us as well. Consider that cars used to be built very strong, but with poor restraint systems and steel glareshields and metal steering wheels. These cars could survive terrible collisions, but their occupants were in far worse shape. Now we have crushable cars, collapsing steering columns, padded dashboards, and good restraint systems. Lately, it's more common for a car to be totalled and the occupant to walk away.

We pilots often reflect that "his biggest mistake was trying to save the airplane." Well, don't build an airplane that will outlast you in a crash! You can always build another one...

In an airplane crash, there are generally multiple collisions. Major airframe components such as engines and wings may rip out of their mounts and collide with other components. The passengers may collide with each other or the cockpit environment. Loose objects may fly free and strike the passengers. In this discussion, only the collisions that involve people are considered.

What happens in a crash?
It is quite useful to think of the forces applied against the occupants in terms of relative g-loadings. The old Newtonian relations of

Force = (mass) x (acceleration) and
acceleration = (change in velocity) / (time interval)

can be combined so that we see

Force = (mass) x (change in velocity) / (time interval).

Let's hope that nothing gets ripped off of me during a crash; then my mass is constant during a crash. So the force I experience in a crash goes up if the total change of speed gets larger and also goes up if the time interval gets smaller. The first conclusion, then, is that a winning strategy to reduce the crash forces is to decrease the loss of velocity and increase the length of time it takes to slow down.

Let's figure that we'll come to a complete stop in the crash. Then the plan is to reduce the initial entry speed in the crash. This means that hitting something at 300 knots is not a good thing. Hitting something at 30 knots is preferable. But the other variable is to increase the time duration of the slowing down. This is important! If we can get the plane to slide to a stop over several seconds, we're far better off than if we slam suddenly into a solid object and stop right away. I'll mention some strategies for doing this shortly.

Speed Kills.

First, reducing the initial speed: okay, this is what I was getting at with the earlier post about stall speeds. The lower your stall speed, the lower is your maneuvering speed, and likely the lower is your sink speed. The speed at which you will stall is so important that FAR Part 23 limits it to 61 knots for any airplane that is certified under that Part.

Stop to consider kinetic energy as a function of airspeed; for a given mass of airplane the kinetic energy varies as the *square* of the velocity, or:

Speed, mph	Kinetic Energy
10	1<---- arbitrarily set to unity
20	4
30	9
40	16
50	25
60	36
70	49
80	64
90	81

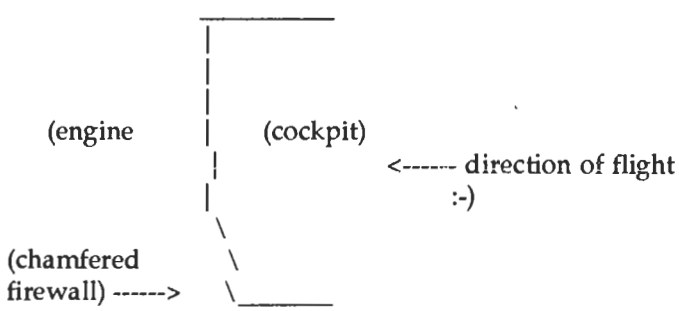
So any effort to lower the stall speed of your airplane is effort well spent toward crash survival. As you can see, going from 60 mph to 70 mph in stall speed (only a 16% increase) causes total kinetic energy to go up 36%. That's energy that will be dissipated in a crash, one way or another.

You can reduce your stall speed without drastically hurting top-end speed by employing high-lift devices. Flaps are the most commonly used high-lift devices, and they work very well to reduce landing speeds. But flaps will never be as effective as more wing area to begin with, so resist the temptation of higher speed with clipped wings... because that's exactly what you'll get.

It also helps to land horizontally, and with your gear down, and on a hard surface. Your plane will slide to a gradual stop much more readily if you glance off the ground at a shallow angle; if you slam straight in at a 90 degree angle to the ground, you will come to a stop very, very quickly. Also consider the surface you'll be landing on: if you land on a hard surface like cement, you will skid and grind and slide to an eventual stop. If you land in soft earth, your sliding airplane may bulldoze up a small dam of dirt in front of it, and then stop much sooner.

Attenuating Forward Loads.

You can modify the airplane to prevent this "plowing", to absorb energy, and to hold together around you. Anti-plowing devices on the forward fuselage can take several forms. One clever modification is to chamfer the bottom few inches of your firewall rearward, like so:



The problem is that the lower lip of a metal cowling is usually bent forward and riveted to the fuselage bottom skin. This lip will plow dirt. Another trick is to build beams into the lower cowling. (these can be part of the engine mount) The important thing is that these beams must resist bending inward, and must allow the airplane to slide forward without digging in its nose. Sorry, I tried to draw this in ASCII, and I'm just not capable of it. Imagine two or three tubes shaped to fit inside the lower cowling and cross braced to each other. These should intersect the firewall as close to the bottom as possible and should be braced above by the engine mount or some other structural component. Basically, you're making landing skids for the nose of your airplane.

In addition antiplowing devices, we want adequate room for forward stroke of the occupant in the restraint system. Seat belts may seem stiff to the casual tug, but they stretch dramatically (sometimes 20%) under the large loads they're designed for. You must consider that stretch, plus your own elastic deformation (not every part of you is seat-belted) in planning the cockpit environment. If your forward stroke is stopped prematurely by a metal

instrument panel, then it's the instrument panel (inelastic) that slows you down, not the elastic seat belt. Bummer.

The matter of adequate restraint capacity in seats, seat belts, and attachments is often overlooked. Most seat belts will degrade in 2 or 3 years, and in any case most are designed for the 165-lb person. My 10-g seat belts (at 100% strength and 165 lbs) are only 5-g seat belts at 70% strength at 230 lbs. The attachment should be to a structural member, not to the floor skin and certainly not to a flimsy seat! Seats also should be sturdy and should not come loose to fling you around inside the cockpit.

Attenuating vertical loads:
To attenuate vertical loads, which are usually upwards, you can build a crushable floor and seats to absorb energy and increase the time spent decelerating. There are several clever seat designs available, both in composite materials and steel tubes. Take a look at a Helio Courier seat if you get a chance -- it's built to collapse progressively, without puncturing the "seat" of its rider (ouch), and without flinging him around. Mission Aviation Fellowship designed a seat made of crushable foam for their back-country mission planes. It's easy.

To absorb lots of energy gradually, the preferred failure mode for most materials is buckling. Tensile failure is quite sudden, and continuity of the part is lost. Compressive failure is consistent and progressive, but tends to turn into buckling eventually in slender materials. Controlled, progressive buckling is best. Crushing foam is actually a buckling process, as the walls of the foam cells collapse. Foam also gets denser as it is crushed, without expanding sideways like most materials. Thus, a foam-cored composite material (you knew I would work composites in eventually!) can crush the foam and fracture the fibers to a huge extent without just catastrophically failing and losing its effectiveness. Usually, a tunnel under the floor panel can serve as the crush zone; this tunnel can carry the control cables and so on, so it's not wasted space.

Landing gear should be considered the first line of defense in absorbing vertical loads. Please make sure your landing gear will not penetrate the cabin, however. There are many, many designs, from rigid steel trusses (not so hot) to oleo struts capable of cushioning an E-2 Hawkeye in a carrier landing. If possible, integrate the landing gear and the crush structure in the floor; let them work together to your benefit.

Many poor landings turn into accidents with the collapse of one or more landing gears. Nosegears are particularly vulnerable, and a collapsed nosegear will almost always lead to nosing into the ground, and sometimes flipping over. This means a *much* more sudden stop, thus *much* higher g's in the crash. Build your landing gear with your life in mind. If you wind up making a forced landing in some soggy, plowed field, your gear had better work for you -- if you nose over and dig in, you're in bad shape.

The last item in attenuating vertical loads is of course the ballistic parachute. In the case of some freak structural failure, you may not be able to fly the plane to a landing. Just make sure that the plane will hang in a survivable attitude when you rig the parachute bridle.

De-lethalizing the cockpit environment.
Okay, let's face it: most airplane cockpits are atrocious when compared to car interiors. We use control yokes / sticks that will kill us, we have metal instrument panels with lots of knobs protruding, we have overhead tubing to bump into, and we often have unrestrained cargo at neck level on the baggage shelf behind us. Not good.

Better is to remove the things that we can hit, or soften them. Padded dashboards and recessed knobs work fine in cars. Cargo nets or bulkheads can help hold down potential projectiles, but remember that in a 10-g crash, a 60-lb suitcase weighs 600 lbs. Three-point or four-

point seat belts are a must; use wide webbing with 3" pads to prevent cutting and to distribute the load. Pad those overhead tubes with foam padding, or better yet relocate them. And do avoid terminating a tube at the cabin frame -- it can punch inwards and impale you. Remember that the purpose of the crashworthy shell is to protect you from injury, but that it must not do you in itself.

Disclaimer:
There are many further considerations to surviving a crash. An example would be prevention or suppression of a post-crash fire. And of course, I've said nothing of accident avoidance! Sadly, we homebuilders are about the only ones willing to innovate in this area; most of the GA industry is afraid to admit that airplanes even crash at all. All of the ideas I've presented here require careful research, proper integration, and thorough testing to bring the desired results, and these are things that a manufacturer can more easily do than a homebuilder. But homebuilders always seem to rise to the challenge of innovation. It's for this purpose that groups like the EAA and rec.aviation.homebuilt were formed, and this is what the "Experimental" category is all about.

My lawyer tells me to include the following:
The author, Mark deLevie, is not a professional or licensed engineer, nor a paid consultant, and is giving general suggestions on a voluntary basis, not in exchange for any monies, funds, gifts, or compensations, and offers no implied or express warranty or guaranty regarding any of the above. This document is for informational purposes only.

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