EAA CHAPTER 32 NEWS

Jim Bower, Editor

September, 2002

Don't miss the September meeting in our new ARC (hangar to you newbies!). The weather should be nice and cool (for a change), and the barbecue will be great. Please join us on September 22 at 2:00 pm. For those of you wishing to volunteer for the Young Eagles events on September 28 and 29, we will be having a pre-meeting meeting at 1:00 pm on the 22nd. We hope to get a lot of help for these worthy events.

Congratulations to Ron Burnett who retired from TWA/AA on September 1st.

INFORMATION HOTLINE

286-9932

CALL THIS NUMBER FOR INFORMATION ABOUT UPCOMING EVENTS

Last Month's Meeting Report

August, 2002

Agaion, shamelessly stolen from the website - thanks, Laura!

PLEDGE OF ALLEGIANCE

WELCOME NEW MEMBERS

ARC

Entire building is enclosed. Siding is finished on walls and main hangar door. Main hangar door enclosed and works. Septic tank is in. No decision about water, well point or shallow well. It will take $230 to replace the tumblers on all the door locks. Bill Doherty will ask a friend for a better price. Union Electric will be contacted about donating materials or labor for the electrical pole.

FUNDRAISER

Entertainment books are available. See Ron Wright for your book. They are $20 and the chapter will receive $4.

CHAPTER 32 ADDRESS

Chapter 32 finally has a new address:

6410 Grafton Ferry Road

Portage DeSouix, MO 63373

YOUNG EAGLES

The next Young Eagles Event will be at the Creve Coeur Airport on Saturday, September 28th and Sunday, September 29th in conjunction with the W.W.I Escadrille. A list was sent around for volunteers for this event and future events. Contact George Stephenson if you wish to volunteer. There will be a meeting at 1pm before the September 22nd meeting for anyone interested in helping.

Meeting was adjoined to eat Barbecue thanks to Doug Killebrew's expert grilling.

St. Louis County Fair and Airshow Report

Labor Day Weekend, 2002

Fundraisers-Chapter 32 raised almost $700 with the AT-6 raffle, pedal plane, soda and water sales.

Aviation Theater - How to Build and Plane and How to Become a Pilot workshops were crowded and the Boy Scout merit badge workshop was overflowing with interested scouts and parents.

Airshow-Blue Angels were as spectacular as ever.

Meeting Alert!

Larry Frey of EAA Chapter 64 extends an invitation to all Chapter 32 members to attend their Tuesday October 1 meeting at his shop in Highland IL. Some of you may remember his attendance at our chapter meeting a few months ago. The meeting starts at 7:00, but dinner is at 6:00, so he suggests showing up early. Dinner will be pork sausage sandwiches with grilled onions and bell peppers, baked beans and German potato salad, cold drinks plus whatever. He would like an idea of who will attend a week in advance to help with food planning etc. Of course spouses are encouraged to attend as well. If anyone needs something from Wick's Aircraft, just let him know and he will be happy to have it ready for pickup at the meeting.

For directions, call Larry at 618-654-7808.

The Hole Story

R.S.Hoover

Mention riveting and the first thing most folks think of is a rivet gun. Of course, it isn't a gun at all, it's a pneumatic hammer but that's what they think of and usually in the negative, too. "I don't have a riveting gun. I guess I'd better build a Varieze." Trying to explain that most rivets are squeezed rather than hammered just gets you a blank look known as Plastic Fixation.

The opposite of Plastic Fixation is the Popper Syndrome. That's the guy who uses pop rivets for everything. A certain Famous Designer, who sells his personally approved pop rivets for about eight cents each damns real rivets with faint praise... then uses about a thousand of them in his wing spar. He also makes much of the fact you don't need all that noisy expensive equipment, such an air compressor, if you use his Personally Selected, Deliberately Deformed Pop Rivets. But a little farther down the page he offers to sell you his Personally Selected pneumatic pop rivet puller for no more than twice the price of the identical thing from Harbor Freight. In doing so he coyly forgot to mention that his Personally Selected pneumatic pop rivet puller happens to need one of those noisy, expensive pieces of equipment known as an air compressor.

> No riveting kit is complete without a collection of holes

No wonder the newbies get confused. Lucky for them I came along when I did because the Truth about rivets is the hole, not what you put in it. Folks tend to forget that no Riveting Kit is complete without a collection of holes. And not just any holes; holes that are a snug fit on the rivet, hopefully in the right places and more or less round. Helps a heap too, if they don't have a lip. Make your holes with a .22 pistol, one side always has a hell of a lip. Use a Whitney-Roper punch, the lip ain't so bad but it's still there. Drill a hole, it'll always give you some lip.

Lips on holes is a bad, bad thing. If your hole has lips it won't fit flush up against whatever it's supposed to. Nor will the rivet set flat. They send inspectors to Cackle Choir Practice jus' so they can cackle with glee when they find a bad rivet. Out comes the Terrible Yellow Crayon and a big bilous X appears to mark your guilt. Mr. Newbie always looks a bit stunned when he discovers he not only has to drill about a zillion holes but is requested and required to de-lip them. Or de-burr them, to use the modern vernacular. (We stopped calling them lips when they started hiring women to build airplanes. Hell of a note. I won't even bother to tell you what they call a prick punch nowadays.)

Newbies are always calculating things. I think it has something to do with trying to get a grip on the slightly fantastical nature of a flying machine made entirely of metal. One of their most asked questions is, "How many rivets does it have?" Lord only knows why they ask such things. "Enough!" is never the right answer to them. They want Hard Facts. So you whip a number outta your ass and they nod and you go on with explaining why we frown on wearing shower shoes to work. Just when you get to the good part with the color photos of the guy's toes laying there chopped off by a sheet of forty thou half-hard, Mr. Newbie pipes up, "So that means you need to drill a gazillion holes!"

Wrong. The correct answer would be seven and a half gazillion. Here's why. You start with a pilot hole, usually laid out and drilled into a pattern or jig. The pattern gets clamped to the work and is used to spot the locations for the holes that will accept the rivets. Once the holes are spotted, you drill them through using a pilot bit, which means a drill bit a tad smaller than the rivet size. The drilled holes are deburred then the mating part is matched to the drilled part and the drilled holes, still in the pilot diameter, are used as a guide to drill through the mating part, which you keep fastened together with PK's or clecos. And of course, the newly drilled holes must be deburred, especially if additional parts are to be secured with the same rivets.

Only when all of the holes at pilot diameter are drilled in all of the parts do you step up to the finished diameter and even then, you generally drill and deburr each hole in every component, opening up the holes to the rivet size with a reamer just before you insert the rivet. Why ream? Mostly because the spec sez to but for the rest of us, it's because rivets and drills and people come in all sizes and one batch of AD4's is liable to be just a tad fatter than another batch. ('Tad' is a technical term, usually defined as half a gnat's ass or .0005" if the wind is from the south and it's a Monday. Don't worry about it for now; you'll pick it up as we go along.) Unlike rivets that are supposed to be the same size but aren't, reamers come in every size under the rainbow, so you pick the one that matches that batch of rivets. But most homebuilders don't ream. Neither do they sew. The whole point here is that one rivet doesn't equate to drilling one hole and deburring two sides. At a minimum, each rivet is going to require about three drilling operations and the deburring of four sides. So stop calculating and get busy.

The basic tool for deburring a drilled hole is a 5/16" drill bit. If you do a lot of this sort of thing you probably got one in the right-hand pocket of your work apron with a lump of masking tape around the shank so some idgit don't chuck it in a drill, because you've taken the trouble to strop the edge and idgit's always dull the drills you love. And if you do much of this sort of thing you'll get sort of attached to things made out of aruminum, which is the same thing as aluminum but pronounced differently. That attachment will cause you to rub your hands and various parts of your body against the thing made out of aruminum and when you find a lip. Or a burr. You'll whip out your 5/16" drill bit, give it a twirl and the burr will be no more.

Over in the pattern shop, where you'll waste several years of your life trying to explain to the newbies why a one inch pitch on an eighteen inch panel means it should only have seventeen holes you'll probably use a dog-leg deburring tool instead of a 5/16" drill bit. Why? Probably because you made your dog-leg tool when you were an apprentice at El Segundo back in '37 and Don Sr. came through the shop one day, looked at your mangled hunka quarter-inch round and said, "Good job, son." But you'd never mention that sterling moment to a newbie. Some things are simply too precious to share. (Even without mentioning it, in time they come to realize there is something Special about your particular dog-leg deburring tool, especially since you'll rip a new asshole in anyone who so much as TOUCHES the thing. But I digress.)

Files are good deburring tools. There's probably an eight-inch, round edge single-cut mill file in the left hand pocket of your tool apron. Unlike a newbies file, yours has a handle, even if it happens to be a piece of corn cob wrapped with friction tape. Dog-leg deburring tools have been a standard in the industry since it was invented by Mr. Doughleag in 1926. He worked for Mr. Loughhead up in Santa Barbara before the polo players ran him off. (Not Malcolm. He was the brake guy. The other Loughhead, Alan or Allan. Moved the plant down to Hollywood just in time to go bankrupt in the Great Depression.)

A dog-leg deburring tool is threaded quarter twenty-eight female so it will accept countersinks and deburring heads. Countersinks & deburring heads come in several flavors, all threaded quarter twenty-eight male. Just screw one into your dog-leg tool and flick your wrist, the dog-leg in the shaft causes the tool to spin around and the burr vanishes. Of course, so does your wrist, eventually.

What you need is More Power.

You can buy a power-operated deburring tool but be prepared for sticker shock, especially if you wander in with 'Homebuilder' stamped on your forehead. Lotsa folks who cater to the Homebuilder Crowd have a pricing policy that makes Enron look like chump change.

So there you are, with a wrist as limp as Odie's tongue and seven and a half gazillion holes to debur. Whatcha gonna do? Whatcha do is order a cordless screwdriver from Harbor Freight, item # 46394. Gonna cost you between $5 and $10, depending on which catalog you order from. It'll come with a wall wart to keep the 2.4v battery charged, a double-ended screwdriver bit, #3 Phillips on one end, quarter-inch straight on the other, plus a standard quarter-hex adapter.

To turn the El Cheepo Screwdriver into a hard charging steely eyed Powered Deburring Tool, wash the quarter-hex adapter with MEK, blow it dry, mix up a dob of J-B Weld and dribble it into the business end of the adapter, which should be stuck into a lump of modeling clay, fixed in a vise or grabbed with a sheet clamp so's it'll stand up straight. Now go find a deburring head, wash it with MEK, blow it dry and moosh it into the J-B Weld. Leave the thing sit overnight and there's your Powered Deburring Tool. ('Dob' and 'Moosh' are more technical lingo. You'll pick it up.)

The real thigh-slapper of rivet-hole deburring is watching those newbies do everything they can to create the largest possible burr. To go with their out-of-round holes. Which ain't in the right place by the time they get done. All because they're using the wrong drill motor.

There's a handy little formula that sez how fast a drill bit of a given diameter has to be rotating to cut a clean hole in materials of various types. Drilling aruminum, using a #41 bit, your drill motor has to be capable of spinning about 3000 rpm. At that speed a sheet of forty thou is virtually transparent to the bit. Just touch the trigger and there's the hole, nice and neat and round and with the smallest possible lip.

See those Jim Dandy drill motor kits at the Wal-mart store? The ones that swear they can chuck a 3/8" bit? That's the last thing in the world you want to use on an aruminum aeroplane. To be able to hog a three-eights hole in a half-inch steel plate the drill motor has to be geared down to about 1200 rpm and that makes it unsuitable for drilling rivet holes in aruminum. What you want is something that spins at least three thousand rpm. The industry standard for drilling holes in aruminum is a high-speed pneumatic drill motor. But of course it takes one of those Evil Machines called an air compressor. Harbor Freight offers a couple of electric drill motors that spin fast enough for drilling aruminum. Their quality isn't very good but they should last long enough to give you at least one airplane's-worth of holes.

Drilling holes, you don't push on the thing. If you do, it's going to wander, or bump the panel. Or some damn thing. Drilling holes with a drill motor turning the proper speed, with a sharp bit in the chuck, the weight of the drill motor is more than enough feed to keep the bit cutting at its maximum rate. The bit and the drill motor will do all the work. They only hired you to hold the thing and move it from place to place. If they wanted something to PUSH on the work they'd be using a drill press. (If you're worried about bumping the panel, put a sleeve of

vacuum line hose on the bit, which is another industry standard that's been around since Jonah was a Seaman Deuce. Or you can buy one of those Patent Jobbies at Enron prices.)

So there's the Hole Story and the bell. Finish up Chapter Six and make two cowling flaps for a DC-3. Next Tuesday we'll get into how to make wing spars out of old orange crates.

Credit and permission should go to Mr. Hoover ***(veeduber@aol.com)***

This article was contributed by Christine Bush, one of our fine members who is building a composite aircraft and enjoys tweaking the noses of metal aircraft builders. It might be hard to find one of these guys in our chapter, but ask any RV builder about drilling holes. ***Thanks, Christine! - ed.***

Wants and Disposals

Roger Moore is selling the engine out of his RV-4 so he can upgrade to more power! You've all seen Roger's airplane fly, so you know this is a good, running engine. Here are the particulars; for more information call Roger at 636-532-5713.

Lycoming O-320 (160 hp), conical mount - 710 SMOH
Harmonic balancer
Marvel carburetor
Lightweight starter
Bendix mags
Wood (Warnke) propeller with 4" extension

$7,000.00 takes it all, (availability November 2002)

Learning As We Go

mr. bill

As I reviewed my ramblings from last month about Oshkosh (hey did I tell ya'll that someone suggested I change this columns name to W.O.W- Words of Wisdom. I did not think you would believe it), several other thoughts came back to me. After months of reading updates in my ROTORCRAFT MAGAZINES about the Carter Copter, it was awesome to see it fly the pattern at Oshkosh. Watching the Gyrocopter tribute to Ken Brock reminded all of losing a greatly talented man in such a weird way. Our Saturday trip to the seaplane base at Lake Winnebago is always a treat. At 1425 the seaplanes launch for the fly-by at Oshkosh. Well this ultra (bright) lite float plane pilot took off before the flock was to launch and was awakened AND GOT HIS FEATHERS RUFFLED by the jet blast of the F-18 who was doing HIS flyby. Ultra scared pilot quickly returned to the lake and landed and hid somewhere on the lake. After the twelve minute flyby the 20 some planes came back in for their "north" landing on the lake when some "youngster with a new handheld radio" broadcasted to the floatplanes that "you are landing downwind on the lake." After the newbie broadcasted this message three times a deep experienced voice came over the radio airwaves and smartly relied, "We know. We are pilots."

The newly rebuilt Sikorsky S-38 owned by Johnson & Johnson Wax was a beautiful site to see taking off and smoothly touching down in the calm waters of Lake Winnebago.

EAA 32 ARC-Aviation Resource Center- is looking great. More work is required and more workers our needed!!!

A possible educational plan for EAA 32 could be for someone (like me) to get the SPORTY'S RECREATIONAL PILOT EDUCATIONAL PROGRAM which is a really good program. It has received high marks on the visual graphics of the RECREATIONAL PILOT flight maneuvers. After reviewing the lessons one of the very talented chapter CFI's could then…….a) give dual in a donated EXPERIMENTAL airplane or…..b) I seem to remember a Mustang II fuselage in our possession, and a Mustang II builder in the chapter, and one or two Technical Counselors around here…. With a nice Lycoming engine attached we could have a great EAA 32 training machine…..

I mention only the RECREATIONAL PILOT Certificate because we do not want to take away business from the flight schools on the field. In fact we can tell them that EAA 32 will get 'em started and they the flight schools, can take care of the big ratings.

On the subject of bigger ratings there are several "free lance" -ex-TWA LLC Pilots out there as flight instructors at the flight schools now because of the layoffs at the airline. In fact my last four first officers were heading to the schools in order to keep flying. For me after 3 great years in the LEFT seat (great because I did not break anything that Crew Chief Gale and the boys couldn't fix quickly) I may soon have to remind myself of the Co-pilots Creed: Gear up! Flaps up! Shut up! Also the Co-pilot after landing lines: It must have been a gust of wind, Sir. Nice (ouch my back) landing! I'll take the cosmetically challenged (ugly) one!

One last Oshkosh sighting was an interesting lady who was ….sitting at the campfire….in row eleven….eating SMORE'S….singing Kum Bi Ya….She claimed to be an award winning EAA Chapter Web designer??? That Oshkosh, it WILL make you do strange things!!!

Editor's Corner

I was almost over my aborted trip to Oshkosh until I read mr. bill's article. Dang the man, anyhow. What I really wanted, however, was to apologize for the incorrect and misleading roster that accompanied last month's newsletter. Suffice it to say that my brain hasn't been working too well lately and I had an operator error with the database. Well, this one is up to date, at least. You can help me, however, by sending me all changes to your address, phone number, E-MAIL ADDRESS (this is an important one), etc. My information is only as correct as what you give me. See you at the next meeting, and keep the shiny side up.

Jim Bower, Editor

Knucklehead Knowledge

larry

Hey Moe! Hey Curly! I think I figured out why I am the way I am!

I, Larry, reprint this article from the pages of the July 2002, EXPERIMENTER so that all will read and heed the info below.

EDUCATION THRU AIRROR

by Ben Morrow

Every once in a while a story appears that reminds us to pay attention to little things we do to avoid an accident or injury. The following article contains two of those stories. And after reading about them, I am going to be more cautious with my refueling in the future.

Plastic Funnel Igniter While Refueling

This horror story on refueling practices concerns the pilot of a Cessna 172 who performed an act of environmental friendliness during his preflight check by draining about a liter of fuel from each tank into a metal can. The fuel appeared clean and free from water, so he decided to pour it back into the aircraft tank, using a plastic funnel with a chamois wired to the funnel in an attempt to dissipate static. While pouring he fuel, he noticed flames around the filler neck. He managed to put the fire out using the entire contents of one extinguisher and most of a second. In the process, he suffered third-degree burns to one hand.

Although the aircraft was inside a hangar with fans running overhead, the air was cold and dry, so probably the draining and general sloshing of the fuel in the can caused a charge to build up on the fuel, the chamois, the plastic funnel, and possibly on his person. These were ideal conditions to create the spark that set off the fuel vapor in the funnel and around the filler neck.

The Shell Oil, Co. has stated that polyethylene plastic containers and funnels should not be used for refueling aircraft. Plastics have insulating properties that can accumulate static charges. High density polyethylene containers made from pure materials are okay, but you must take extra precautions and adhere to certain standards. If you aren't sure about the plastic refueling equipment you are using use metal cans and metal funnels. These are safer, if used properly.

Here is a synopsis of another horror story published in Heliprops. The pilot/ owner of a Luscombe was using a 16-gallon plastic polyethylene tank rigged with a Schrader valve to dispense gas by air pressure. He had already transferred more than 400 gallons by this method without incident.

On this fateful occasion he was using the local service station gas pump. The 16-gallon tank was situated behind the driver's seat of his car. He was using a plastic funnel with a metal screen. He lifted the funnel to check the contents and then added a bit more fuel. As the fuel stopped running he lifted the gas nozzle to avoid spilling the last few drops. Suddenly the gas in the funnel burst into flames. The fire quickly spread out of control.

Ignition was probably caused by static electricity in the swirling gasoline and then discharged through the funnel to the grounded hose. The pilot received extensive burns and took four months to recover.

Proper Ultralight Refueling

Most Ultralight refueling I have observed appears dangerous, particularly if you consider the hazard criteria described above. Ultralight publications never deal with this subject, and I have never heard of an Ultralight refueling fire. This begs the question, what are the Ultralight pilots doing that is different? I see the using plastic funnels and cans. I see them refueling without a ground wire. I see fuel spills around and over the aircraft. I can think of only two major differences: the addition of oil to the fuel and possibly the smaller size of the containers used.

Does this mean we may see Ultralight refueling fires when more machines have oil injection of four stroke engines that require an oil free gasoline? There seems to be an element of luck in transferring gasoline that breeds complacency. The long transfer of more than 400 gallons without incident certainly trapped one unlucky pilot! I would hazard a guess that many pilot rigged fuel systems out there are just waiting for the right conditions to go "BANG!"

(Reprinted from the FAAviation news, available online at www.faa.gov/avr/afs/ news and transport Canada's newsletter, Aviation Safety Maintainer.)

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Check out our fantastic Web Pages at

WWW.EAA32.ORG

Laura Million, Web Designer

While you're there, take time to join the Yahoo Groups to help you stay abreast of Chapter happenings!

TO: