



# DESIGNEE NEWSLETTER

THE PUBLICATION OF THE EAA DESIGNEE PROGRAM



WITTMAN AIRFIELD, OSHKOSH, WI 54903-2591

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The **DESIGNEE NEWSLETTER** is a forum for the exchange of information and ideas of interest to aircraft and ultralight builders, restorers, and flyers. The sources of the materials published are EAA Designees, readers, Chapter newsletters, and other publications. Readers are encouraged to submit manuscripts, drawings, and black/white photos for consideration. Every effort is made to select accurate materials of interest to a majority of readers. Opinions expressed and responsibility for accuracy rests entirely with the contributor. All materials submitted become the property of EAA - no remuneration will be made. Materials should be sent to Chuck Larsen, EAA Designee Director.

### DESIGNEES, SUBSCRIBERS AND READERS:

Wisconsin's winter brings a view to Wittman Field unfamiliar to most who frequent the EAA convention site during summer months. A blanket of snow muffles memories of the footsteps of thousands, the surging rumbles of aircraft engines springing to life, fresh green turf . . . all the sights, sounds and activities that make the annual OSHKOSH Convention the premier aviation event for the world. But today it is different as the snow covers the grounds, roofs signs and equipment so familiar to aviation enthusiasts from around the world. It is almost as though the campgrounds, buildings and aircraft parking areas are resting . . . gaining strength in preparation for the coming summer. The quiet tranquility is broken only periodically as the buzz of a light plane signals their taking to their wings or returning to their hangar and the roar of turbo-props as they serve the needs of commerce. It only seems proper that airplanes break the spell cast by winter and foreshadow what is to come at OSHKOSH '84.

The buildings and grounds may stand silent but the hum and bustle of convention activity already rings through the EAA Aviation Center. The work of the convention goes on throughout the year but this month sees these preparations spreading from our convention co-ordinators offices to all of the EAA staff and the army of volunteers who form the nucleus of leadership as convention chairpersons.

Two of these chairpersons are John Grega who leads the airshow aircraft review group and Fred Goldstone who does such a fine job in helping organize the Designee forums and Designee Information Areas at each convention. If you are available and willing to support these gentlemen in their activities please contact them:

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You may also contact me at the EAA Aviation Center in Oshkosh.

Chuck Larsen, Designee Director

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## THE FREEDOM OF FLIGHT EAA ULTRALIGHT '84 JUNE 15, 16 & 17 WITTMAN AIRFIELD OSHKOSH, WI

**EAA AIR ACADEMY '84** needs "a few good EAA craftsmen" to provide hands-on instruction in workshop activities. Individuals skilled in the crafts required to build, restore and maintain aircraft are needed to work hand-in-hand with participating youth to pass the love and skills of aviation so dear to EAAers hearts. An experienced sheet metal aircraft builder or builders are also needed to prepare and supervise the construction of the MONI to be assembled during the Academy from July 15 through August 4 this summer. Consider expanding your 1984 "OSHKOSH EXPERIENCE" by instructing in this new EAA program for youth. For details contact Chuck Larsen, Director of Education at the EAA Aviation Center.



Oshkosh  
July 28-Aug 4  
Wittman Airfield  
Oshkosh, WI

### EAA's NEW OSHKOSH ADDRESS

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# LETTERS 'N SHOP TALK



**CONVENTION NEEDS:** Vern Lichtenberg, EAA Convention Site Supervisor, is in need of 2 or 3 good, used pick-up trucks, a heavy duty wrecker and a 6000 lb. capacity forklift with tractor type front tires for use on the Convention grounds. If you have one of these vehicles that you would like to donate - tax deductible - contact Vern at (414) 426-4800.

**GLUE TESTS:** It is a common practice for homebuilders to use several kinds of adhesives during the construction of wood airplanes because some types are easier to use in certain situations than others. There is, however, a possibility of one type of adhesive adversely affecting another. A long-standing airworthiness directive in England prohibits the use of Aerolite hardener near other types of glue.

To assess possible adhesive interaction, Chem Tech, Inc. of 4669 Lander Rd., Chagrin Falls, OH 44022 recently ran a series of tests using epoxy (Chem-Tech T-88), resorcinal (Weldwood) and urea-formaldehyde (Aerolite). The summary of those tests reads as follows:

"Epoxy adhesives, whether uncured or fully cured, may be adversely affected by the formic acid constituent of Aerolite hardener and, to a lesser degree by the acidic resorcinal adhesive. Tests performed on Chem-Tech T-88 epoxy adhesive indicated that it is acceptable for use in conjunction with Aerolite and resorcinal provided that these adhesives have fully cured.

Similarly, normal use of Aerolite and resorcinal do not interfere with previously cured T-88. These considerations should apply to other brands of epoxy adhesives as well, however, the user should satisfy himself regarding the suitability of any other epoxy adhesive, particularly in critical structural applications."

## FIBERGLASS FUEL TANK PROBLEMS

*From the New England Sport Aviation News via the Billings, Montana EAA Chapter 57 Newsletter*

A common reason for the failure of the (fuel tank sealing) compound to adhere is due to wax on the inner surface of the tanks.

Although they look and smell alike, there are two kinds of polyester resin in common use. The kind commonly sold in marine supply stores is called "finishing resin". It contains a small amount of paraffin wax. When this resin is brushed out on some work, the wax floats to the surface, cuts off direct contact between the surface of the resin and the air, and thus makes the resin cure with a hard, dry surface that turns to dust when sand-papered instead of gumming the paper up. It is thus good for surfacing work, such as repairing leaky boats with a fiberglass skin.

The other kind is called "laminating resin" and is what is commonly used in making things of fiberglass laminate. Containing no wax, the surface tends to cure with a tackiness that accepts and bonds well with the next layer of resin and cloth.

So when one rushes to a marine store and says "Gimme a gallon resin", one is likely to get surfacing resin . . . and a layer of wax on the inside of the gas tank.

If you intend to make up a gas tank, a cowl or anything else that must be reliable in flight, use laminating resin; it is seldom sold in regular marine stores — you get it from the supply houses that cater to commercial users of fiberglass.

**SHOULDER HARNESSSES - YOU BET YOUR LIFE:** *by Lloyd Glover, from the FAA CHATTERBOX, published by Milwaukee, WI FAA FSDO #61.*

As a result of test conducted by the Federal Aviation Administration and data collected from aircraft accidents, especially AG aircraft accidents, all small civil aircraft manufactured after July 18, 1978, are required to have a shoulder harness for each front seat. The chances of you and your passenger escaping serious or fatal head injuries in an otherwise survivable accident are many times greater if shoulder harnesses are used. If you own an aircraft that is not equipped with shoulder harnesses and wish to install them, the following procedures must be followed:

The addition of shoulder harnesses is an aircraft alteration and if riveting or welding is required, or if the primary structure is disturbed in any way, it would be defined as a major alteration. Aircraft major alterations must be approved by an Airframe and Powerplant Mechanic (A&P) with Inspection Authorization (IA) or an appropriately rated FAA approved Repair Station. Completion of an FAA Form 337 and an aircraft record entry is also required. If the shoulder harnesses can be installed without disturbing the primary structure, welding or riveting, it would be defined as a minor alteration and the work may be approved by an Airframe Mechanic. In this case, only an aircraft record entry is required.

Regardless of who installs the shoulder harnesses, the work must be done in accordance with acceptable methods which can be found in Advisory Circular AC 43, 12-2A, Chapter 9. When purchasing materials, the webbing must meet the standards established in Technical Standard Order TSO-C22f and the hardware must conform to acceptable standards such as AN, NAS, TSO, or Mil Spec. The strength requirements or the inertia load factor of the installed shoulder harnesses can be found in 14 CFR 23.1413 and 14 CFR 23.561 of the Federal Aviation Requirements.

It is recommended that prior to starting the installation you check with the aircraft manufacturer or the aircraft parts manual. Previously approved kits or retracts may be available that can reduce the time and expense required. It is also recommended that if difficulties are encountered, other aircraft similar to yours can be checked. This may provide valuable information such as part numbers, attach points, etc.

The installation of shoulder harnesses is highly recommended and if further assistance is needed, contact an Airworthiness Inspector at your local FAA Flight Standards District Office.

## T-88 STRUCTURAL (EPOXY) FOR WOOD

*From the SKYBOLT NEWS, EAA Chapter 443's Newsletter*

T-88 is a relatively unknown epoxy of superior quality which I have used for several years. The manufacturer of this product is a chemist and ardent amateur boat builder. He (Jerry Schindler) of Chem-Tech has informed me that our own Tony Bingelis, who writes the "Designee Corner" in SPORT AVIATION and is the builder of an Emerald and a Turner T-40, is a user of T-88. I don't blame Tony one bit for using it. It really is a fine epoxy. A few of its major advantages are:

1. The mix is one-to-one (equal parts).
2. It can be used at temperatures just above freezing (35°).
3. It is non-staining; after drying, the color is that of varnish.
4. The thickness of the glue joint is not critical. (Some epoxies demand a joint of no more than .011 gap.)
5. It does not shrink.
6. It is not affected by rot, fungus, oil or gasoline.
7. It has good pot life (35-40 minutes at 75° plus you have an additional 15-20 minutes immediately after mixing during which time the mix is heating. It is then re-stirred and is ready for use.)

# TECHNICAL TOPICS

## THE POOR MAN'S MILLING MACHINE

From Peter Beck, EAA #19566, 8712 Queen Elizabeth Blvd., Annandale, VA 22003

Last winter I decided to build the Cricket from scratch. Because the Cricket is a finely engineered airplane, designed in France to metric specifications, a number of aluminum plate parts are either called out at a thickness not commonly available in this country, or require a flat, shallow taper. Reducing plate thicknesses, cutting an angle shim, or a flat taper is no task for a file, even if you have triceps like Popeye's, and most of us just can't gain regular access to a milling machine.

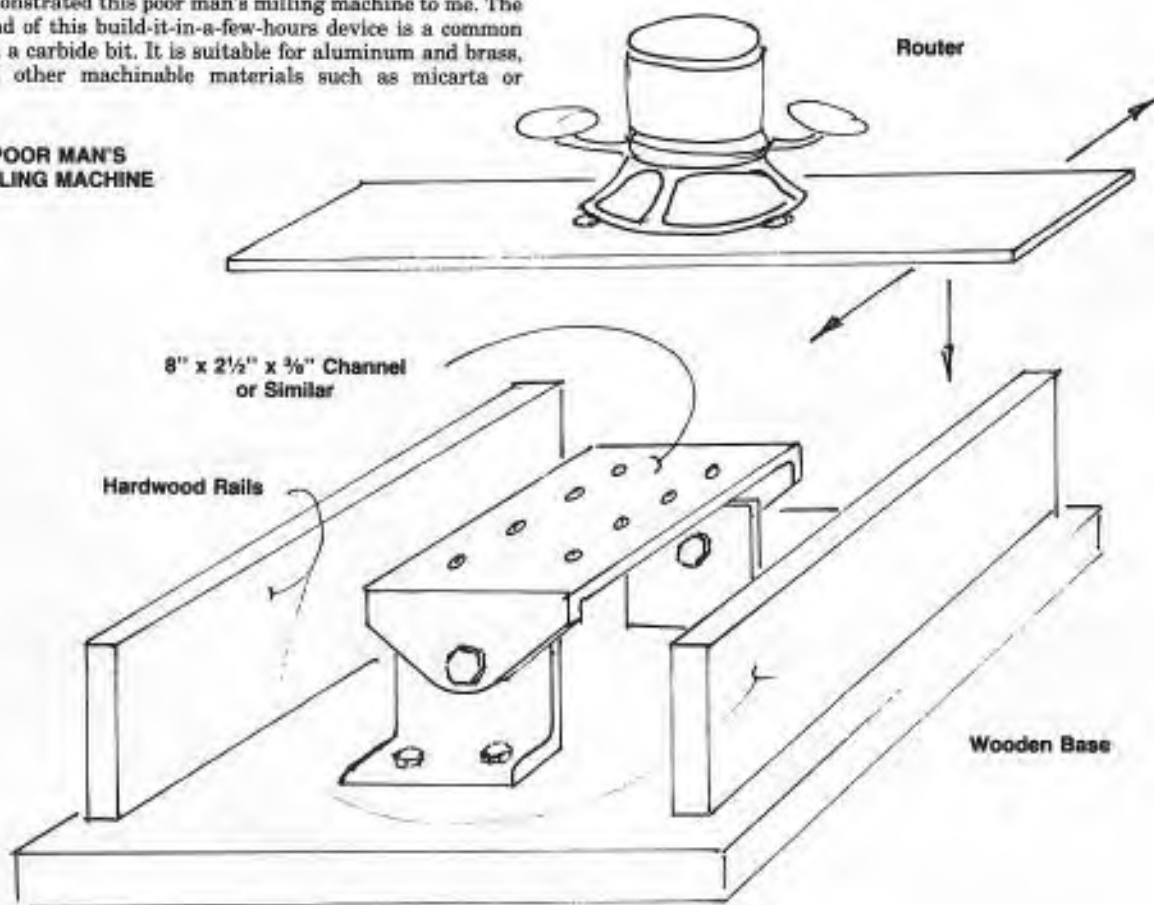
Jack Barbour of Hampton, VA, a friend long famous for his precision craftsmanship supporting NASA wind tunnel experiments, demonstrated this poor man's milling machine to me. The business end of this build-it-in-a-few-hours device is a common router with a carbide bit. It is suitable for aluminum and brass, as well as other machinable materials such as micarta or phenolics.

## USE

The table is set with a protractor or other means to the angle required by the work.

The carbide router bit should be used. It should be set deeper and deeper with successive cuts until the piece is the proper thickness. Simply guide the router assembly resting on the parallel rails with your fingers, making successive passes over the work, like an end mill, until the desired area has been planed. This does not require extreme pressure or force, since the carbide bit does all the work. As long as the cuts are shallow, the bit will not grab.

POOR MAN'S  
MILLING MACHINE



## CONSTRUCTION

The drawing illustrates the machine. It is a tilting table set between two parallel hardwood rails. A board, to which the router is mounted, rides on these rails. The table can be set at any angle, and the depth of the router bit can be set very accurately. The work to be tapered or planed is clamped to the table, the table is set to the proper angle, the router is set to the proper depth and then passed back and forth over the work, using only finger pressure to guide the board mounted router along the side rails.

The table is constructed of a piece of eight inch or so wide aluminum or steel channel, mounted to two support angles using two  $\frac{3}{8}$ " bolts. The channel is  $\frac{3}{8}$ " or more thick. Threaded holes are bored and tapped in the table top to permit work to be dogged or clamped with bolt-down clamps. The table is mounted about an inch below the top edge of the rails, depending on the thickness of your work.

Jack maintains that any aluminum can be milled in this way. He claims that he has even shaved the heads of steel hold-down screws occasionally, and the bit seems to take it in stride. He doesn't feel though, that he would want to mill whole pieces of steel in this way. 2014 and 7075 aluminum alloys mill beautifully and draw-file to a nice finish. If you are cutting 6061 aluminum, use tallow on the bit to avoid overheating and spalling and metal.

If you have a router, this is truly an inexpensive and highly effective way to shape some of those odd-ball plate pieces.

# DESIGNEE VISITS

One of the important services provided by our DESIGNERS is visiting aircraft building/restoration projects to discuss and offer suggestions about them. The DESIGNERS in the following listing are to be commended for their efforts in helping to make sport aviation a safer activity by providing this service. Comments for publication are selected for the purpose of providing guidance or assistance to builders and the DESIGNERS visiting them. DESIGNERS are requested to note problems or procedures observed in their project visits in the comments section of the Designer Visit Report.

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