On Final

EAA CHAPTER 25 | Minneapolis/St. Paul, MN | March 2001

March Meeting (3/21, 7 pm)

John Monnett's Sonex is being compared to the Ford Model A and the Piper Cub as a design destined to become a classic. Three new Chapter 25 members have chosen the Sonex for their first homebuilding project. At the March meeting, Jeff Coffey and John Koser, pictured at left with Sonex prototype #1 at AirVenture 2000, will share John Monnett's philosophy and their experiences building this aircraft.

(Continued on page 4)

Building a PIETENPOL

By Greg Cardinal

Dale Johnson and I started our Pietenpol project in January of 1997 with the fabrication of the ribs. By the end of that first year we had a completed fuselage and the empennage components were done. Ours is the lengthened fuselage version that is called for when using a Continental A-65 model rather than the original Ford "A" engine. We did elect to retain the original or "Jenny" style wooden

(Continued on page 6)

Old Rhinebeck's Curtiss JN-4H Jenny

Search for Aircraft Wire

By Christian Bobka, Technical Counselor

At the request of the MNANG Museum, who are scratch-building a JN-4H Jenny replica, Greg Cardinal, Dale Johnson, and I have done lots of

(Continued on page 7)

Cleared for the Approach

by Frank Hanish

This month we are featuring a group of Chapter 25 members that are each building a Sonex. Jeff Coffey and John Koser will present for us what finalized their individual decisions on selecting this recent Monnett design. Plan on learning about this plane. Their presentation will be very informative. Jeff has invited us to a project visit… just as soon as we can get that scheduled.

Technical Counselor Program

An EAA Technical Counselor is an experienced volunteer advisor who shares knowledge and expertise to aircraft builders. These Technical Counselors are part of the "member helping member" tradition of EAA. The Technical Counselor in this capacity has no authority to approve or "sign off" the aircraft or any aspect of their construction. They advise builders on constructing a safe, airworthy aircraft for final FAA inspection.

These volunteers visit projects and advise builders on how to comply with building instructions and federal regulations. Technical Counselors offer tips based on their experience and help builders avoid costly mistakes. Technical Counselors help maintain the excellent reputation of the amateur-built program.

Through the years the FAA has re-written Advisory Circular 20-27, Construction and Operation of Amateur-built Aircraft, to include mention of this EAA program. In fact, it has contributed to the demise of what was referred to as the "pre-cover inspection." Today, a read through the current AC 20-27 will show you just how important belonging to an EAA Chapter, and the hosting of a project visit, can be to the final FAA inspection of your project.

The Technical Counselor Program is intended solely to facilitate informal contacts between homebuilders of aircraft and interested persons who have informed the Experimental Aircraft Association and/or its Chapters that they are available to render advice to such homebuilders.

Pre-purchase Inspection

Whether you are looking to buy an amateur-built (or any such) air-

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ON FINAL

EXPERIMENTAL AIRCRAFT ASSOCIATION CHAPTER 25 MSP

Minneapolis/St. Paul

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craft, an inspection is just that – it is simply another aircraft inspection. The FAA does not have a separate classification referring to pre-purchase inspections. Occasionally, we get a request for a Technical Counselor to look at a particular aircraft… especially when the buyer is several states away. This is no different than asking a friend to go look at that boat you saw listed in the newspaper.

I have summarized the EAA Technical Counselor program to delineate that there is a difference between the project review, and possible advice given the builder within the construction stage of a project vs. what is generally referred to as a pre-purchase inspection. Unless your TC holds an Inspection Authorization certificate from the FAA, it is advised that you seek such professional services to perform this task. Be prepared to pay for this service. Any seller that does not allow you this privilege, is not the guy from whom you wish to make this purchase. At any rate, these inspections are not part of the EAA Technical Counselor program. The emphasis of this EAA program is in the building process.

One thing that I can add to this is the fact that any aircraft is a collective assemblage of components. The health of any aircraft is reflected on it's weight and balance sheet. In comparing same make and model, it could be said that there are apples, and there are pears. Just like us humans, right? Given that there were no design changes in the construction, if an aircraft's weight and center of gravity are within limits, then it should fly just like it's siblings.

KidVenture 2001

With little effort, we are close to 33% of your goal to collect 75 past EAA Calendars. What is this, you say? We are helping Chapter 790. We need your old calendars for a youth program at KidVenture. Look around your home, office, or hangar… I bet you can find some around somewhere. Just bring them to any upcoming chapter gathering. They MUST be EAA calendars. We will see that they get to Oshkosh.

Spring will soon be here… check out the Note-EAA-M's section on page 8. The calendar is beginning to fill. Notice the chapter picnic date has been set for Saturday; June 23rd. Did you know that the month of March here in the Minneapolis area is statistically the most active for waterfowl strikes? Just a safety issue, I chose to share with you.

Good building, and then safe flying.

WELCOME NEW MEMBERS!

Jeff Coffey **Peter Denny**
Mark Kolesar **John Koser**

THIS MONTH: Directions to ANG Bldg , MSP:

Meeting Wed., Mar 21st, 7:00 p.m.

Eastbound on Hwy 62 past the light at intersection with Hwy 55. Take the exit for Fort Snelling. At the stop sign, the large gray federal building should be ahead and to your right. Continue straight through the intersection. Skip the next paragraph.

Westbound across the Mendota Bridge on Hwy. 55. Proceed on Hwy 55 and take the exit for Fort Snelling. At the stop sign, turn right, proceed under the bridge, and turn right again at the sign for Hwy 55 East. Proceed past the 2nd sign for Hwy 55 East directly to the stop sign ahead. You should see the large grey Federal building ahead and to your left. Turn left.

Follow Federal Dr to the right around the federal building and continue west to the next stop sign. The Air National Guard will be ahead at about your 10 o'clock. As you approach the guard shack, dim to parking lights only. Tell the guard you are here for the EAA Ch. 25 meeting. Go straight until you see a chapel on your right. The parking lot for the ANG center will be ahead on your left. Proceed to the center of the building to the briefing auditorium.

YOUNG EAGLE PILOT ALERT!!

Those of you who plan to participate in the Young Eagle program for 2001 need to send the YE coordinator some information. Contact your insurance agent and ask the agent to send Mike Dolan a Certificate of Insurance. The agent will do this for you without any additional cost to you. In addition, please send a copy of your airman's certificate and current medical to the YE coordinator. Also be prepared to provide the following information to organizer of the YE event when you participate. We will need the aircraft annual inspection date (if you have that info already then you can include that with the other info) and information showing you are current for taking passengers. In addition if the event is a Boy Scout event they require us to provide your total flying time as well. Thanks for participating!

NOAA APPROACH PLATES ONLINE

Check out the website below to download NOAA approach plates from Echo Flight at no charge:

http://edj.net/cgi-bin/echoplate.pl

sonex

by Pete Gavin

Growing up in a family of pilots with visits to Oshkosh every summer, Jeff Coffey was exposed to homebuilt aircraft from childhood. When he began looking for a project to build, he wanted something affordable that he could build with simple tools. He attended a SportAir workshop where he received hands-on training with wood, composite, and metal. As a result of the workshop, he decided on metal.

The more Jeff looked at options, the more he liked the Sonex. It could be built from plans with a low initial investment. It would fit in his garage (with the family car parked outside, that is). Built from 6061-T6 aluminum, it would not require painting. He could use mostly "pop" type rivets, which meant he could do most of the work without a riveting partner. Jeff learned that he could improvise where he lacked specialized equipment (See homemade press brake for wing leading edge on right.) And in areas where he lacked skills such as welding, there were "sub kits" available.

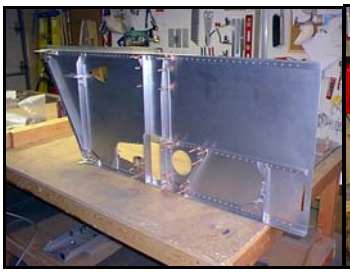
Jeff with completed wings (see closeup of pitot tube above on right)

John Koser's interest in aviation also began at a young age, when he and a friend helped out around the airport in exchange for rides from local pilots. John got his private license in 1997, and attended Oshkosh in 1999 with a mission to find the model he would build. John had rebuilding experience with a 1928 boat and an Austin Healy, so he had some idea what he was getting into. He liked the idea of building from plans, and also liked the idea of buying materials as the project progressed. John needed a project that could be split between basement and garage space, and one he could complete at home to the point of attaching the wings. He also liked the simple approach of using 6061 without paint, and a project that would not require welding.

John had pretty much narrowed his choices down to the Sonex and Zenair 601 by the time he got to Oshkosh. After visiting both booths and getting to know more about the people behind the models, John felt that the Sonex would give him more plane with better construction for less money. Compared to the Rotax, John also liked the simplicity of the Jabiru engines recommended for the Sonex.

Michael Carland remembers flying with his grandfather who was a flight instructor in the Army. His uncle was also a flight instructor as well as an air traffic controller. Michael earned an instrument rating after his private license, and began to look into homebuilding. After debating the high cost and 2000-hour build time required for a Sequoia Falco, Michael decided on the Sonex as a better match. Michael sees the Sonex as a fun plane, simple to build, and a pro-

John with completed main wing spar



Right hand side of fwd fuselage

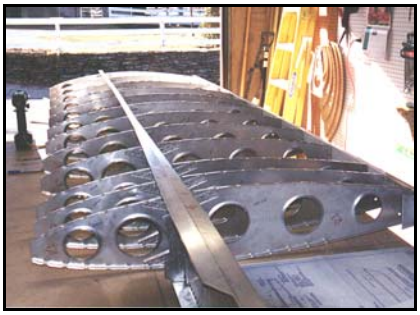
Beginning fwd fuselage assembly

ject he hopes to find time for in spite of work and family commitments. Michael chose the easy-build kit to keep the time to a minimum, and he is just getting started on the project.

Jeff began building from plans in April of '99, and is now nearing completion of the basic airframe. He says the blueprints are outstanding and very thorough. Overall, he has found the project easy to build. Even construction of the main wing spar, although difficult, was still manageable. Jeff says a variety of resources are there whenever help is needed. These include a Sonex contact, Sonex's Builders Internet Resources, and a very active e-mail list with over 300 plans holders.

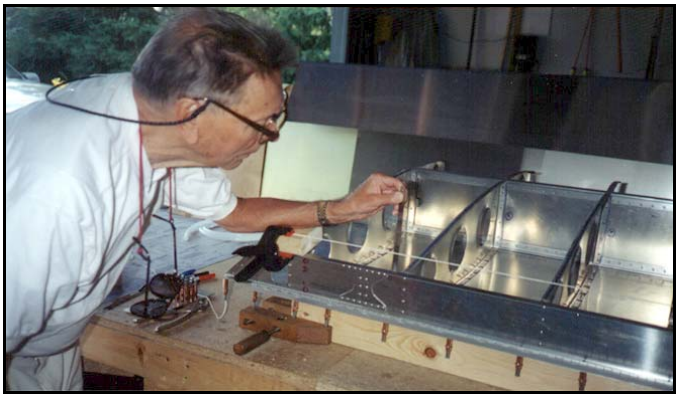
John attended the Sonex workshop in October of '99, and was impressed with John Monnett's approach to design and building, including his appreciation of the homebuilder's need to learn and build with simple tools. He also liked John Monnett's choice of the Jabiru engine for the Sonex.

John began building in November of '99, and found he could make immediate progress. Since John is semi-retired, he is able to devote more of his time to the project. Although building space is limited, John found that he could construct many of the small parts in his basement over the winter. John has high praise for the blueprints, and feels he can build to within a millimeter or half millimeter of tolerance. He says the quality of finished sub-assemblies parallels plans and fellow builders' descriptions. He has gotten great support from Sonex, and also goes to other builders' websites. Both John and Jeff praised Bill Faulstich, Ch. 25 Technical Counselor, for his helpful advice.



Completed wing skeleton

Jabiru 2200 Engine



Chapter 25 Tech Counselor Bill Faulstich checks out John's wing skeletons.

We look forward to seeing these planes at one of our YE rally's one of these days!

SONEX SPECIFICATIONS

Length	17' 7"
Wing Span	22'
Wing Area	98.0 sq. ft.
Air Foil	64-415
Primary Structure	6061 aluminum
Cockpit Width	40 in. at shoulders 38 in. at hips
Stall Speed (25 degree flaps)	40 mph [64 km/h]
Stall Speed (clean)	46 mph
Max Flap Extended Speed (Vfe)	100 mph [161 km/h]
Maneuvering Speed	125 mph [109 km/h]
Never Exceed Speed (Vne)	197 mph [317 km/h]

Engine	**80 hp 2180 VW**	**80 hp Jabiru**	**120 hp Jabiru**
Empty Weight	600 lbs.	550 lbs.	600 lbs.
Fuel capacity	16 Us Gal.	16 Us Gal.	16 Us Gal.
Range @75% S.L.	475 miles	475 miles	425 miles
Max Speed @ S.L.	150 mph	150 mph	170 mph
Cruise @75% S.L.	130 mph	130 mph	150 mph
Cruise @75% 8000'	150 mph	150 mph	170 mph
Pwr Loading (gw/hp)	13.125	13.125	9.167
T.O.Distance	300 ft	300 ft	200 ft
Landing Distance	500 ft	500 ft	500 ft
Utility Category			
Gross Weight	1100 lbs.	1100 lbs.	1100 lbs.
Baggage (Max)	40 lbs.	40 lbs.	40 lbs.
Rate of Climb	800-1000 fpm	800-1000 fpm	1200-1400 fpm
Pos Load Factor	+4.4 Gs	+4.4 Gs	+4.4 Gs
Neg Load Factor	-2.2 Gs	-2.2 Gs	-2.2 Gs
CG Fwd Limits	20%Wing Chd	20%Wing Chd	20%Wing Chd
CG Aft Limits	32%Wing Chd	32%Wing Chd	32%Wing Chd
Aerobatic Category			
Gross Wgt-Aerobatic	850 lbs.	850 lbs.	850 lbs.
Baggage (Max)	10 lbs.	10 lbs.	10 lbs.
Rate of Climb	1200-1400 fpm	1200-1400 fpm	2000+ fpm
Pos Load Factor	+6.0 Gs	+6.0 Gs	+6.0 Gs
Neg Load Factor	-3.0 Gs	-3.0 Gs	-3.0 Gs
CG Fwd Limits	25%Wing Chd	25%Wing Chd	25%Wing Chd
CG Aft Limits	29%Wing Chd	29%Wing Chd	29%Wing Chd

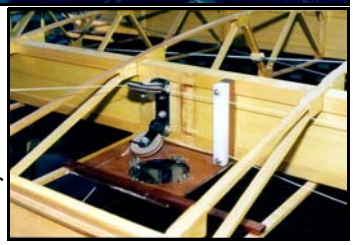
Building a PIETENPOL *(Continued from page 1)*

landing gear with tall wire spoked wheels for an authentic antique look. We are not installing brakes and are using a simple tail skid instead of a tailwheel to add to the antique theme but this will limit us to grass strips only.

Completing the antique look are antique altimeter, tach and a slip/skid indicator salvaged from a Grumman Hellcat. All mounted on instrument panels of polished black walnut veneer. A simple wind-vane airspeed indicator will be mounted on the lift strut.

Seat backs are woven wicker for lightness and comfort. Instrument access panels and helmet box door have wooden piano hinges. Luggage compartment has brass spring-loaded latches; all hand made in Dale's workshop.

A common theme among Pietenpol builders is to build according to the plans to save weight and keep it authentic. We are staying true to the plans with one exception. The original plans call for cables and pulleys from the control stick to the elevator bellcrank or "walking-beam". There is nothing wrong with this but



Dale and I saw a much cleaner looking arrangement at a Pietenpol gathering in Brodhead, WI a couple of years ago. Instead of pull-pull cables to the walking-beam we installed an articulated push-pull tube from the stick to the walking beam.

Three piece windscreens are being fabricated from sheet brass and Lexan. Cockpit coamings are built up using aluminum tubing for strength surrounded by foam insulation for padding. The coaming is finished off with black garment leather. A 15 gallon fuel tank has been fabricated from galvanized steel with soldered seams.
One wing is currently mounted and being rigged. Next steps include rigging the empennage and plumbing the fuel and instruments to the firewall.

We are frequently asked "When will it fly?" Our standard answer is "When it's finished". Building this aircraft has been thouroughly entertaining and educational. Check out www.aircamper.org for good information. There is also an internet discussion group hosted by www.matronics.com.

Search for Aircraft Wire *(Continued from page 1)*

research on the origins of "aircraft wire". They needed some. The Jenny uses it all over for bracing. Dale and Greg had selfish motives as well for they wanted to use some in their Pietenpol. We have determined from period literature that "aircraft wire" is defined as "tinned piano wire". We have also determined that "music wire" is not the same thing as "piano wire". Ask your piano tuner. He will tell you that music wire would not last very long in a piano because it develops stress cracks from vibration at the bending points at the tuning pegs and it would fail there. Also, Jim Ladwig, with a view from the balsa and tissue model constructor's perspective, states that what hobby shops sell as music wire today is different from music wire from the old days. So maybe in the past, music wire was the same as piano wire but the case does not hold true today. To solve the mystery, then, we need to know what "piano wire" is.

Look in the index for Machinery's Handbook and there it is. Piano wire. Yes, just turn to page 535 or 539. But nothing on the page discusses piano wire. Music wire, yes. Piano wire, no. The words are not even on the page. They are talking about making springs. Close. Oh well.

But we did strike paydirt. Greg works in downtown Minneapolis. On a hunch, knowing that before the days of the AN specs, the Society of Automotive Engineers was really big into specifications for aircraft, I asked him to see if the main branch of the Minneapolis Public Library had any copies of the annually updated SAE Handbook for years in the late 'twenties. Sure enough, they did but they did not know where they were. The books were in limbo. A librarian's nightmare. "We have the book but we don't know where it is other than somewhere amongst these million or two volumes." It seems that robotic machines in the closed stacks shelve the books and these were just in a pile somewhere deep underground. But the librarian remembered seeing them once and after a few days, called Greg and said he located a couple copies!!

The Society of Automotive Engineers did have a specification for aircraft wire in 1928 and 1929 in their Handbook which lists all SAE specs. We found that, although the tensile strength varies based on the gauge of wire, it was all in the neighborhood of 200,000 psi but never anything less. I don't have the Piet drawings in front of me now but the typical size used in a Jenny is around .100 inches in diameter. This equates to (.100) (.5)(.100)(.5)(3.1416) or .0079 square inches of cross section. The wire should be able to withstand a pull of (200,000 lbs/sq in) (.0079 sq in) or 1580 lbs. This is the pull strength of the wire. Notice that the turnbuckles we use are rated at numbers in this vicinity.

from justplanenuts.homestead.com

The closest thing we found here in Minneapolis with a 200,000 psi tensile strength is fence wire at Mill's Fleet Farm. It is the only wire we found easily that had any tensile strength spec at all. We bought a 2000 foot roll for about 32 dollars. The tag attached to it said: "p/n A43-2 2000 ft. - 12 1/2" ga. Class III Galvanized Guaranteed min. 200,000 PSI Hi-Tensile Wire Common Sense Fence/Geotek, Inc. Stewartville, MN Made in USA Southwestern Wire, Inc. P.O. Box CC Norman, OK 73070 50# coils 12 1/2 gage extra-high tensile wire". SKU number is 7 1600299016 3. It appears that it is made by Southwestern Wire and marketed by the Common Sense Fence people.

We have a lot. The coil is about 32 inches in diameter and would literally explode if you don't build a box around it first before you cut the wires holding it all together. We used three old pulleys to make a straightener so that we could run the end of the coil in one end and push it through the pulleys that were stagger mounted on a piece of micarta so that the wire would come out straight.

It seemed to form reasonable well. We fabricated an eye using the methods demonstrated in Brimm & Boggess and in recent articles by Bob Whittier in the Experimenter and put on a cable eye from a turnbuckle. The Jenny drawings and many other drawings of aircraft of the era like the Waco and the Travelair show a ferrule made to look like a squashed spring. We could not find them available anywhere. We also determined that they were too difficult to make. At the suggestion of Andrew King, who said that the Standard used to fly down Main Street, Taylor, Texas, at the opening scene of The Great Waldo Pepper used them, we decided to use regular nicopress copper ferrules. We cleaned the wire, dipped it in non-acid flux, and nicopressed on the copper ferrule, the kind used on 3/32" galvanized aircraft cable. We turned the loose end of the wire back over the end of the ferrule. Once this was done, we soldered the fitting with 50-50 lead/tin solder. Dip soldering is preferred. Other than using a copper ferrule instead of the squashed spring, it looked just like in Brimm & Boggess.

(Continued on page 8)

Note-EAA-M's

Notes to EAA Chapter 25 Members

Chapter Gatherings

Mar 21—EAA Chapter 25 Meeting
Sonex Projects, 7pm, MSP ANG
Apr 18 —EAA Chapter 25 Meeting
Location to be determined
Apr 22 — St Cloud Airport Day
Ch 25 helping w/YE Rides
Contact Pete Gavin 612-866-6676
May 16—EAA Chapter 25 Meeting
Project Visit-Ron Hoyt's Kolb Mk III
Apple Valley, MN
Jun 9 — Int'l Young Eagles Day
Glencoe Airport (GYL), and will
also host event at Lakeville (LVN)
Jun 23 — EAA Ch 25 & UL Ch 92
Combined Annual Picnic—Potluck
at Glencoe Airport (GYL)

Fly-Ins/Special Events

Mar 29-30 Mpls Raddison South
Mn Aviation Technicians Conf
800-657-3922
Apr 4 St Paul Mn ANG Museum
30+years as an Aerial Gunner
by Don Zupan 612-713-2523
Apr 8-14 Lakeland, FL.
Sun 'n Fun EAA Fly-In
Apr 18-20 Owatonna MN
Mn Council of Arpts Ann Mtg
Dave Beaver 507-444-2448
Apr 21 Bloomingtn Thndrbrd Htl
Mn Avia. Hall of Fame Induction
Noel Allard 952-448-5047
Apr 21 Red Wing Mn (RGK)9-4p
7th Ann Twin Cities RV Forum
Jim Lenzmeier 651-633-8488
Apr 28-29 Springfield IL (SPI)
Charlie Wells Memorial FlyIn
Jerry Coleman217-483-3201
May 13 Warren Mn (D37) 8-noon
Mothers Day FlyIn Pancake Br.
Dennis Bohn 701-772-0879
May 19-20 Anoka Co. Arpt (ANE)
Discover Aviation Days
May 19-20 Clear Lake, Mn (8Y6)
Salute to Bob Leaders FlyIn
Hog roast, hangar dance, etc.
Ch 551, 320-252-2596
Jun 16-17 La Crosse, WI (LSE)
Deke Slayton Airfest 2001
www.airfest.com
Jun 17-24 Paris France
Paris Air Show
Jun 23-24 Davenport, IA (DVN)
Quad City Air Show 2001
US Navy Blue Angels
www.quadcityairshow.com
Jul 24-30 Oshkosh, WI (OSH)
Airventure 2001

Aircraft Wire *(Continued from page 7)*

Dale Johnson developed a pull testing device (right) using a long metal beam, some manufactured fittings, and a calibrated hydraulic bottle jack. When this wire was tested, he took it to 2000 lbs and it held without stretching or pulling the wire through the ferrules. He did not test it to the breaking point although I wish Tom Weir would have his crew manufacture some more for testing purposes. I think this is the stuff to use.

I have talked to guys like Andrew King and Gene Demarco, who builds and rebuilds stuff at Old Rhinebeck Aerodrome, and they both agree that music wire is way too stiff and cannot be formed. Yet the Gary Underlin bunch that built the big Sikorsky S-38 at Born Again Restorations swear that music wire is the only thing to use. But they have lots of expensive tools to form stuff (and make more tools) and we don't.

Don Geng gave me a copy of a book on how the aeroplanes were made for the movie, Those Magnificent Men and Their Flying Machines. They had the same problem trying to come up with the right wire in the early 'sixties. They referenced a biography of Tony Fokker who pioneered the welded tube fuselage crossbraced with wires and turnbuckles. Originally, Fokker used the hardest and strongest wire he could find. The higher the tensile strength, he thought, the better. But the wires kept breaking due to brittleness, stress cracks from bending, and metal fatigue from vibration.

After a couple of in-flight breakups, he went to a softer wire and he did not have anymore failures. I believe the current day music wire fits in the hardest and strongest and highest tensile strength category, and it is not the stuff to use. The "Magnificent Men" book also said they were able to find the squashed spring type of ferrules in England in the early 'sixties. "We don't know what in the world someone would use them for, but there they were, thousands of them", the book said. It seems that I might remember crawling under the bed when I was a kid and the mattress box springs used them to tie the spring wires together. Or maybe it was the upholstery in my 1967 Chevelle?

Any mattress salesman out there? Or car restorers? If anyone has turned up anything else on this subject, please let me know. This is definitely in the realm of lost technology. I can't believe we can't figure out something that was commonplace merely 70 years ago!!!

Stuff for Sale/Wanted

For Sale: George Jevnager's RV-6A partners are selling their half. Plane located at FCM. Contact George 952-933-2485

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Kolb Firestar, 503 powered, elec start, enclosed cabin, ski's ... $11,000 Glencoe, MN
Bournorm Thomongsta 320-864-6365

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Ski's A-1500 $600 Contact: Marv Getten EAA Chapter 587 hangar on FCM. H. 473-5398

Seeking partner for 46 Champ 7AC project in Belle Plaine. Contact Jim Lockbaum for information. 952-873-3224

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Wanted: PA-11 or J-3 project with at least 85 hp eng. $100 finders fee, if purchased. Call Larrry (EAA #560368) 800-439-6038 fax 218-439-6246