

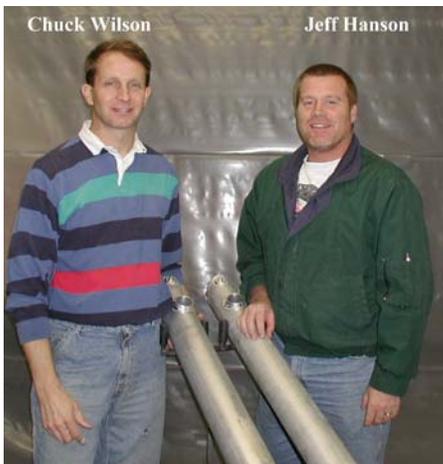
# Hangar Echoes



Experimental Aircraft Association ★ Chapter 168 ★ Dallas, Texas

## Extended Range Fuel Tanks for RVs

By Chuck Wilson and Jeff Hanson



If you are one of the many thousands of proud Van's Aircraft pilots or builders around the world, you are or will be justifiably elated with the incredible performance and flight characteristics of these aircraft. Our two RV-4s have been flying for about six years and many

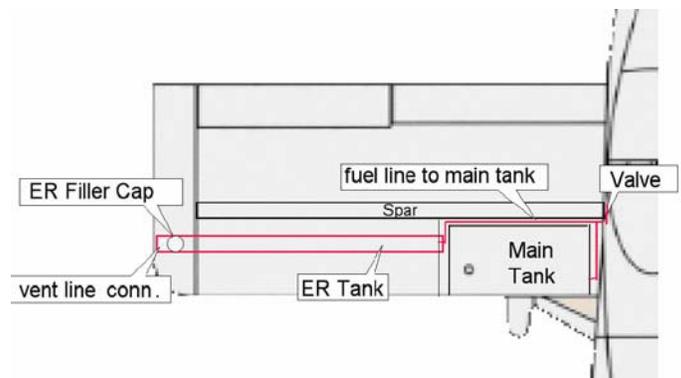
memorable trips, formation flights, and introductory flights have been made possible because of them. A recent trip from Dallas to central New Mexico to visit Red Marron started us thinking about how nice it would be to have a little extra fuel on board. As the old adage goes, you can never have enough fuel unless you are on fire.

We were interested in additional fuel only if it could be engineered correctly. The criteria were very simple. The

implementation must not in any way affect current flight characteristics, it must be simple to install or retrofit into existing RVs, and of course it must be cost effective. Therefore, the design has to be light in weight, right on the CG, no fuel pumps, ability to isolate the auxiliary fuel, have minimum impact on the original fuel system and must be structurally sound.

Chuck had talked about the possibility of using a “tube style” tank in the rib lightening holes but didn't think the increase in fuel versus effort to install was worth it, but after some more thought we decided it would work. The physical limitations of where to put the tank dictated that a 4”

*Continued on page 4*



## Feb. 4th Chapter Meeting

By Michael Stephan

Our Feb. 4th Chapter Meeting will be held at the Farmers Branch Library, located on the northwest corner of Webb Chapel and Golfing Green Dr. The meeting will be held in the auditorium and will begin at 6:30 p.m. and finish by 9:00.

This month's speaker is record setting pilot Bruce Bohannon. Just recently Bruce was awarded a couple of more records to add to his collection. I heard Bruce speak before and it was quite interesting. Bruce took a very interesting path through aviation. So, don't be late. This should be a very entertaining meeting.



## Feb. 8th Chapter Fly-In

By Michael Stephan

This Month's Fly-In will be to Hicks Airport for lunch at the restaurant on the field. This is one of my favorite eateries. We plan to meet at 11:00 am. Hicks airport has several things of interest. Avery Tool is located just a few hangars north of the restaurant and a few hangars south is Jay Pratt's RV assistance center. We may have to drop in and pay him a visit.

## CHAPTER 168 BOARD OF DIRECTORS MEETING

The February BOD meeting will be held on the 11th at the Farmers Branch Library at 7:00 PM. The minutes from the January 14th BOD meeting (recorded by Monroe McDonald) are as follows:

- Members in attendance: David Cheek, Don Christiansen, Scott Christensen, Sam Cooper, Bruce Fuller, Monroe McDonald, Jerry Mrazek, John Peyton, John Phillips, Michael Stephan, Don Wilcox
- The upcoming program speakers are Bruce Bohannon on Feb 4 on his ongoing record-setting flights and Danny Duggan on Mar. 4 on safety and seaplanes.
- The Feb.8 and Mar. 8 airport meetings will be at Hicks Field and Spinks Airport (Cracker Barrel restaurant), resp., at 1100. Michael Stephan has been offered a tour of the Superior engine factory, which he will try to set up for a Saturday Chapter 168 function.
- Future newsletter assemblies not settled yet, John Phillips will research.

- Board member nominations are needed by the Feb. chapter meeting, to prepare for the election at the March meeting.
- The chapter's bore-scope is back in service, having been repaired by Monroe McDonald, and tested by Don Christiansen.

## February 25th Newsletter Assembly

By Michael Stephan

The March issue of Hangar Echoes will be assembled at the home of Clay and Milissa Romeiser on Tuesday February 25th. The address is 3205 Amherst Ave in University Park Between Hillcrest and Airline, 1 blk north of Lover's Lane. If you need directions call 214-739-6364.

Clay is building an RV-9. He is at fuselage/panel stage. The tail is finished and the wings need the bottom skins. He is also putting an EFIS in his plane. There is plenty to look at and the rivet work is excellent. Hope to see you there. These RV-9 guys are going pretty fast. I'm going to have to hurry to keep my quickbuild -8 ahead of them.

## Upcoming Events

### Local

- **Feb 2** - AOPA Air Safety Foundation Pinch-Hitter Ground School Dallas/Fort Worth, Texas SITE: The Marriott-Dallas/FW Airport TIME: 9:30 a.m. FFI: 301/695-2169 or [www.aopa.org/asf](http://www.aopa.org/asf)
- **Feb 8** - Flapjack Fly-in Breakfast Sulphur Springs Muni Airport Sulphur Springs, Texas SPONSOR: Sulphur Spring Sport Aviation Association NOTE: All the flapjacks & sausage you can eat \$5 (kids under 12, \$1). FFI: Airport Phone, 903/885-4911 or [www.eaa1094.org](http://www.eaa1094.org)
- **Feb 8** - Chapter 168 Fly-in to Hicks Airport for Lunch.
- **Feb 9-11** - Helicopter Association International Heli Expo 2003 Dallas, Texas FFI: Marilyn McKinnis, HAI, 1635 Prince Street, Alexandria, VA 22314 703/683-4646; FAX: 703/683-0341 Website: [www.rotor.com](http://www.rotor.com)
- **Feb 27-28** - 37th Annual SMU Air Law Symposium Addison, Texas SITE: Hotel InterContinental FFI: [www.smu.edu/lra/jalc/symposium.htm](http://www.smu.edu/lra/jalc/symposium.htm)
- March 8-9 - SportAir workshops, Dallas TX. Skyline High School.
- **Mar 15** - 2nd Annual Hangar Dance Long Star Flight Museum Galveston, Texas FFI: 409/740-7722 or [www.lsfm.org](http://www.lsfm.org)

### National

- **Apr 2-8** - 29th Annual Sun 'n Fun EAA Fly-In Lakeland Linder Regional Airport Lakeland, FLORIDA
- **May 16- 18** - EAA Southwest Regional Fly-In (SWRFI) (ABI) New Braunfels, Texas FFI: [www.swrfi.org](http://www.swrfi.org)
- **Jul 29- Aug 4** - EAA AirVenture 2003 51<sup>st</sup> Annual EAA Fly-In Oshkosh, Wisconsin

## A Message from Chapter President John Phillips

### FREE STUFF I USE

It's January. It's supposed to be cold and dreary and we should all be hunkered down in front of the fireplace, waiting for the sun to come back and thaw the oil in our engines.

It's a good time to daydream about the places we'll go when the daffodils and the redbuds come back. I thought I'd take the opportunity to tell about some of the free stuff I've discovered on the computer that I think is really helpful for pilots. First off though, let me make my usual lawyer "disclaimer" that I am not responsible for anything I say. I use these programs and I like them, and I hope you'll find them as useful as I do, but as pilot in command you are ultimately responsible for your own planning and safety and the safety of your passengers and the folks on the ground underneath you.

<http://map.aeroplanner.com/mapping/TFR.cfm>

Everyday before I fly I check this one. It shows a map of the USA, which is updated twice a day except holidays and weekends, showing current Temporary Flight Restrictions throughout the country. [However, it's 7:11am Sunday morning as I write this, and the site shows that it was "Last Updated: Sun, 05 Jan 2003 13:01:00 GMT" so it looks like the updates cover the weekends also]. It's especially critical for us in North Texas when the President visits his Crawford Ranch [The TFR is then over 2,800 square miles in size!! Be careful]. Using the mouse on your computer you can pinpoint any particular TFR for detailed information about the dimensions and effective times, and you can also see a depiction of the TFR space in full color, in full size, on a sectional chart, which you can print to carry with you in flight.

<http://adds.aviationweather.noaa.gov/>

Next is weather. There are a number of weather sites available on the internet. I happen to use this one most frequently. You can get METARS (even translated into plain English), TAFS, AIRMETS and SIGMETS, PIREPS, radar and satellite views of the country and closeups of your area. One of the features I like best for a quick overview is METARS displayed graphically. You can view a multi-state region and see at a glance whether reporting stations are vfr or ifr, cloud cover, surface winds, altimeter, temp/dewpoint, and any current weather.

<http://www.duats.com>

You should also know about the DUATS site for weather and flight planning. "DynCorp DUATS is a free FAA-sponsored service to pilots, dispatchers and others authorized by the FAA." You must register in order to use it, but the registration is free. DUATS is very complete and you can even file your flight plan through the site. However, I think it's confusing and user-unfriendly.

<http://www.duats.com/graphics/graphics.html> is the DUATS graphics page and I do like the 12-48 hour and 72 hour forecast charts. CIRRUS is a windows interface to DUATS which you can download at <http://www.duats.com/cirrus.shtml>. I find that even the CIRRUS program is confusing to use.

<http://www.airnav.com/>

AirNav is one of my favorites. It has all the usual airport information, and sometimes even has an aerial photo of the field. In addition, however, it has information about the businesses and services on/near the field, AND comments from users. If you're going to a "strange" field, look it up on AirNav and check out the comments. Most places get a pretty favorable review, but I have seen a couple FBOs that I would avoid because of unfavorable comments. For a really neat feature, click on the "aviation fuel" tab, and "plan a flight with fuel stops." You fill in your departure and des-

tinuation, and your range and some other criteria, and AirNav will give you a selection of routes with fuel stops - by shortest route or by "cheapest" route.

### flight planning

There are flight planning programs everywhere - free and commercial. I do not subscribe to any of the commercial programs so I cannot tell you anything about them. I use AeroPlanner which actually is a commercial program, but it is offered to us as members of the EAA for FREE. I highly recommend it. To access it you must start at <http://members.eaa.org>. Follow the instructions on that page to "LOG IN." [If you're using a computer at home or someplace not accessible by the public I suggest you mark the "boxes" to remember your name and EAA number - it will make logging in faster the next time]. After you have logged in and entered the Members section, click on "EAA Flight Planner" which will take you to the Flight Planner page. You must REGISTER to use Flight Planner. [this is in addition to "logging in" to the EAA member site]. Whew, still with me. Once you get "Registered" simply follow the instructions. I think you will find that the AeroPlanner program is pretty intuitive. [If you're like me and don't read the instructions, just start "clicking" on things that look interesting. Soon enough you'll find what you want]. With AeroPlanner you can create a performance profile for your own airplane. You can create flight plans and save them for future use. You can even "publish" your flight plan when you save it. That way, for example, you could use a computer anywhere you might fly (at an FBO or a friend's home) to retrieve your saved flight plan, reverse the route of flight and apply the current weather for your trip home. AeroPlanner has a FREE feature called Basic TripTick which will allow you to print your entire route on sectional charts [it actually prints 5"x7" chunks of the sectionals, on standard size paper, which you can then cut to the 5"x7" size to fit on a kneeboard]. Be sure you take your full size sectional with you also. If you deviate very far from the course line on the Basic TripTick charts you'll "fall off" the edge.

One last FREE item, which I really use a lot, and makes my daydreaming portable is a two-part application for PalmPilot and Visor type handhelds which starts with the program CoPilot. You can get the CoPilot program at:

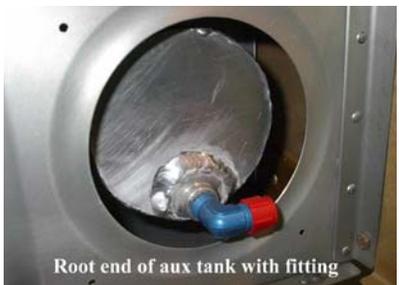
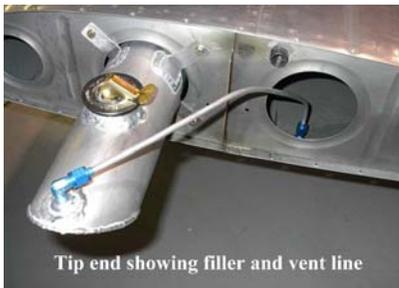
<http://www.palmgear.com/software/showsoftware.cfm?prodID=7184>.

[If for any reason that link does not work do a "google" search for "copilot laurie davis" and that should take you right to a site where you can get the download]. CoPilot is an application program for Palm type handhelds that performs flight planning calculations, that you would usually perform with a ruler, a protractor and an E6B calculator. CoPilot stores the data for flights so that you can refer back to previous trips or modify them for new trips. The second part is the database of airfields and nav aids which you can download [also FREE] at <http://navaid.com/~ptomblin/CoPilot/>. I update every month or two. On the internet download site you can customize the information you want to download so that future downloads are easier. I download from all 48 contiguous states, all airports (including frequencies, runway info, and more), all vor's and vortac's and vor/dme's, and the source data (e.g. FAA and date). All of that information stored on my Visor takes only 3335K. My Visor goes everywhere with me. Whenever my mind starts wandering to faraway places I fire up CoPilot - let's see... Dallas Redbird to South Padre...hmmm.



diameter 6061 T4 aluminum tube with welded endplates and filler neck along with bung type fittings for the vent and fuel feed would fit into the lightening holes just ahead of the spar. In order to maximize the volume we extended the tank from just outboard of the main fuel tank to the wing tip (see diagram). After brushing up on our math, we figured that 4.1 gallons per side or 8.2 gallons total could be achieved. This represents a 25% increase for the RV 4 or at least another hour in the air. Our conclusion was that this kind of significant increase in range was well worth the effort to start jumping the hurdles to see if the design could be implemented easily and cost effectively.

After a great deal of work our goals were met or exceeded with a prototype installation. The total weight is less than ten pounds. The tank arrangement, which is just ahead of the spar, places it on the CG envelope, thereby eliminating a shift in CG as fuel leaves these aux tanks. Since there is no CG shift, the original rear seat passenger weight and baggage still applies (up to the max. gross weight). Concerning fuel imbalance, tests were flown in a worst case scenario with both the aux and main tanks full on one side and empty on the other. The aircraft was

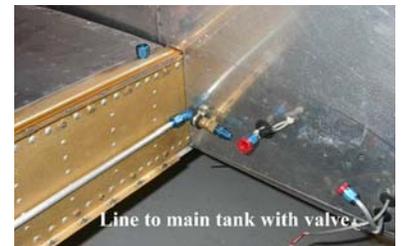


completely controllable down to the stall in all flap configurations. Since there is no baffling in the aux tanks we have limited the aircraft to "cross country" type maneuvers and only when the fuel is out of the aux tanks (after about one hour of flight) go back to original limitation. We feel that the "no affect on flight characteristics" goal was achieved.

The transfer valve (one for each tank) completely isolates the aux

tank from the main tank so when the valve is closed, the original fuel system is unchanged. The vent system provides enough positive pressure to transfer the fuel to the main tank in less than 5 minutes once the main tank is below full and the valve is turned on. The only external clue to this system is the fuel filler door in the wing tip. Installation into an existing RV will require removal of the main fuel tanks and the wing tips. The next step is feeding the tube tank into the leading edge lightening holes and securely mounting it. A fuel line out of the aux tank is fed to the area behind the main tank and on to the transfer valve. The valve is mounted on the fuselage wall with the handle inside for easy access. A line from the valve to a bung type fitting in the main tank is the final step in the installation. There is no requirement to open up the main tank to install the fitting. The installation is not difficult once you get past the idea of removing the main fuel tanks. Obviously if the RV is still being built, the installation is ever simpler. Therefore, we believe the simple to install goal has been attained.

Since we have been flying with these extended range tanks, a number of local RVers have expressed interest and enthusiasm with a request to make these tanks available for them. After much consideration we have formed Hotel Whiskey Aviation LLC as a means of building and supplying this extended range tank design. We now have the aux tanks available as a kit complete with everything you would need to install. In order to offer this kit, we felt that some additional testing still needed to be completed.



Each tank in the kit, which is made up of structural aluminum for strength and ease of welding, will be pressure tested for leaks. A sample tank has been structurally tested to 270 lbs simulating +9G at the full fuel weight. This was done to test the structural integrity of the tank and the mounting struc-

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ture at the aircraft max limit. These tests were supervised by a local Dallas DER, Al Backstrom. In addition we have met with a representative from the Dallas area FSDO to verify that this constitutes a minor change and under those rules requires only a logbook entry and test flight. With this testing completed, full installation kits for both the 4 and the 6 series with all necessary parts and installation guides are available. A step by step "how to" and flight manual supplement is included. The net result is a 25 % increase or 8.2 gallon for the RV 4 and a 18% or 6.75 gallon increase for the RV 6/6A (6 main tanks are longer, therefore shorter aux tank). We at Hotel Whiskey Aviation LLC are now offering this tank kit for an introductory price of \$850. As for the 7, 8, and 9 RVs, we would be interested in your comments as to whether this kit would be of interest.



These aux tanks won't get you around the world but you might be surprised just what they can do. This new fuel capacity now gives you a range of 800sm. plus VFR reserves on the RV-4, (that is from Dallas to

Chicago) or 900sm. plus VFR reserves on the RV-6/6A. So, if you are taking a long cross country, need to fly around a weather system or just want to load up on cheap fuel in the area, you are now able to add an additional hour's worth of "liquid fun." In our opinion this fuel tank kit makes a great airplane even better.

E-mail us at [jeffandsus@attbi.com](mailto:jeffandsus@attbi.com) or call Hotel Whiskey Aviation at 214-551-1902 / 972-896-7852 with your interest or comments.

## News and Notes

By Michael Stephan



### SportAir Workshops

SportAir workshops are coming to Dallas, March 8-9, 2003, Dallas, TX. The Classes will be taught at Skyline High School. This is a good chance to get a little hands-on experience learning that building skill. Topics include: Sheet Metal, Composite Construction, Fabric Covering, Electrical Systems and Avionics, Gas Welding and What's Involved in Kitbuilding? For more information on each area of interest including the cost, you can find it at:

<http://www.sportair.org/workshops/index.html>. Be sure and register early to reserve your place.

## Young Eagle Scholarship

In February, EAA National will be sending out certificates for those who flew 10 Young Eagles or more last year. The points can be applied as a credit to their EAA Academy. I don't know what dollar credit value each Young Eagle gives you, maybe the certificates will define it.

I received an email from Chapter 972 who is sponsoring a young lady. They are asking for pilots to donate their points to the cause. Since we don't have a candidate of our own, this may be something you want to do. If you know of someone who is interested in attending the summer aviation camps, let someone on the Board know, so we can help them. The following is the note I received. If you are interested in helping, the contact information is listed below.

"Chapter 972 at Gladewater has a young lady who wants to go to the Young Eagle camp at Oshkosh in the summer and our chapter is trying to sponsor her. Our pilots are donating their points toward this effort. We would like to know if anyone in your chapter would like to donate their points towards this young lady? We would be extremely grateful for any certificates we receive toward this effort. If so, please contact Bill Vawter, YE co-ordinator for 972, and advise him. You can contact him at 903-769-4031 or via email at [bvawt@cox-internet.com](mailto:bvawt@cox-internet.com)

Thank you very much. Regards,

Jerry Gardner, EAA chapter president 972 Tyler, TX"

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## Board of Directors Election

We will be electing a new Board of Directors in a few months. So, if you are interested in the Direction of the Chapter, or would just like to increase your level of participation, let someone on the current Board know and we will add you to the current slate. The Board meets the on the Tuesday the week following the Chapter meeting.

## Kitplanes Radio

I refer to Kitplanes Radio in the Bohannon article following this one. If you are not familiar with what that is, it is an internet only broadcast in which the hosts interview the movers and shakers of the kitplane industry. You can listen live on Thursday nights, but the shows are archived so you can listen when you have time. To listen you must have some multimedia player like the Real Player or the Windows Player (which is included in most operating system installations). The show has aired about 7 weeks, so if you haven't heard any shows you have plenty to catch up on. Some of the guests interviewed are Bruce Bohannon, Van, Eggenfeller, Lancair, Zenair, Rans, Aeotronics and many others. The web address is <http://www.wsradio.com/kitplanes/>. If you have time, check it out.

## Bruce Bohannon Visits Chapter 168

By Michael Stephan

Our outgoing vice president, David Cheek, gave us an excellent parting gift in arranging for Bruce Bohannon to speak at our Feb. meeting. I guess he wanted to go out on a high note. He did.

If you are not familiar with Bruce, he is a fellow Texan who has been setting "Time to Climb" records for the past several



Picture from Avweb

years. He began his record setting in Pushy Galore, which is now in retirement at the museum in Oshkosh. Now in his new Exxon Flying Tiger, new records are being set and time shaved off his current records. Last October in Palm Springs, Bruce flew to 12,000 meters (~40,000ft) in 32 minutes to set the record. Other records accorded to Bruce approved by NAA are the unlim-

ited records (covering all categories of aircraft) for the 9,000-meter (29,537 ft) and 12,000-meter time-to-climb (39,370 feet) altitudes. In the C.1b weight class, which the Flying Tiger is in, the records set were the 9,000- and 12,000-meter time-to-climb records, the absolute altitude record of 41,300 feet, and the record for altitude in horizontal flight at that altitude, in which he was required to fly level for 90 seconds.

For those not familiar with the Flying Tiger, it is a Harmon modified RV4 with the tail feathers of the RV8. It is powered by a turbo-charged IO-540 built by Mattituck that can develop sea-level power at the altitudes he flies. It is flown from what would be the RV4's back seat and uses the RV3 canopy. So it is a combination of all things good. On the Kitplanes radio show Bruce commented that he is always tinkering with the airplane to try to improve its performance.

A few years ago I traveled to Granbury to hear Bruce speak, and I was very entertained by his exploits in aviation, especially the stories from his crop dusting days. This will be a very exciting program. Thanks David.





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## State of the EFIS Address

By Michael Stephan

The last time I spoke about EFIS systems I made mention about the current developments, but since then quite a bit has happened. The most important to me is that I now own one and am installing it in my panel. There has been of few companies join the fray and a few that have improved on last year's offerings.



In the new offerings group is the Op Technologies Flight Op 200. This is a non certified unit, certification coming in the future, with primary flight instruments, using the Watson AHRS unit for attitude indication, engine monitoring, and moving map navigation provided by an internal GPS and Jeppesen® navigation data. One of the nice features with this unit is that it interfaces well with much of the other equipment out there. So, it could possibly overlay real time weather, TCAS and other goodies in future enhancements. Of course, all this comes at a hefty price of \$22,900. The unit is more expensive than the experimental Blue Mountain and Dynon systems. But, it looks like a competitor for sure. If you are interested in learning more, go to [www.optechnologies.com/products.html](http://www.optechnologies.com/products.html).

The next system that is still on the horizon, so to speak, is the EFIS from Dynon. After announcing a product a few years ago it has focused on completing and testing their unit before they offer it to the public. This bug free strategy will hopefully pay off in increased customer loyalty and satisfaction. Dynon announced that the EFIS-D10 will start shipping on March 3rd. This system includes the basic flight instruments as well as a heading indicator. You should be able to see and purchase this EFIS at the major fly-ins this year. The price is

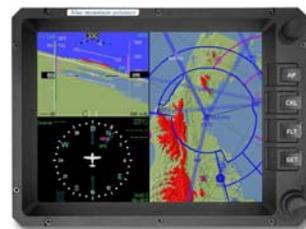


right with a pre-release price listed in the \$2000 range. It will probably be higher once in production, but they are in the right neighborhood. They also offer a custom-made angle of attack probe, which looks very interesting. For more information on this system visit [www.dynon-development.com](http://www.dynon-development.com).



The EFIS systems that have received a lot of buzz recently are the products from Blue Mountain. I think I'm partly to blame, since it is the one I chose. Blue Mountain offers both a flight instruments only unit called the EFIS Lite and the complete panel system called

the EFIS/One, which includes the basic 6 flight instruments, navigation data including a moving map, and engine monitoring information. Since my last article this unit has undergone a few changes. The most obvious change is the screen. The EFIS/One now uses a 10.4" high intensity transfective screen with the menu buttons and input knobs built into the screen bezel. Another one of the obvious improvements is the terrain following and "synthetic vision". The vector based moving map has terrain information as well as victor airways, airports, and airspace. It can also toggle between a VFR or IFR mode, which displays different data needed by the pilot. The "synthetic vision" is the terrain elevation displayed in the artificial horizon with objects higher than the current altitude highlighted in red. We have no mountains around here to worry about, but I'm hoping that they add all those pesky steel towers that seem to grow around here like weeds to the terrain database. This unit does require setup and calibration, but with that comes flexibility. You can make this unit do just about anything.



The most important change to the Blue Mountain EFIS systems was to the company itself. At the first half of last year, many criticized the lack of products being shipped, the broken promises and nagging bugs that led to very critical reviews. This was the result of one person, Greg Richter, who struggled trying to drive it all. In September, Malcolm Thompson became the COO



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and using his management skills improved the efficiency and started getting product out the door. This freed Greg up to fix all the nagging operational issues as well as finish some much-appreciated enhancements. Recently, Lancair ran it through their test program and reported that they will start offering the system to their customers. This is a turnaround, since last year they were very critical of the unit's performance. Currently this unit is selling for \$12,800, and more info can be found at their website [www.bluemountainavionics.com](http://www.bluemountainavionics.com).

This is a very complete unit. Add a radio and transponder and your panel is done. Sounds simple, but I added as much redundancy to my panel as my wallet could stand then a few more dollars thrown at it to get that perfect panel. I'm pleased with my panel so far. Flight time will be the final test. Next month I will detail my adventures in hooking up the magic in this box.

Also available for your non-gyro panels are the Pocket PC based AHRS systems from PC flight systems and a new entry from the Anywhere Moving Map developers at Controlvision. These are the PDA computers that are provided data from an external AHRS box. They added engine monitoring, weather, moving maps that run on separate PDAs. They are priced in the \$1500 - \$2000 range. Currently, Controlvision's Attitude Indicators are not shipping, but expect them to ship soon. For more information visit [www.controlvision.com](http://www.controlvision.com) and [www.pcfightsystems.com](http://www.pcfightsystems.com).



What I am still looking for is a unit that can retrofit into that 3 1/8" hole where that dead artificial horizon currently sits.



All the available units are just a bit too wide. Maybe some industrious individual will solve that problem before next year's State of the EFIS article.

## Fly-In/Drive in to Meacham

By Michael Stephan



Last month the January weather played its usual part, but we still had fun at the museum at Meacham. David Cheek, the trooper that he is did make the flight over from Addison and brought Bruce Fuller with him. I saw quite a few Chapter members looking at the aviation memorabilia. It really is nice to tour any museum with people that are much more knowledgeable than myself. For instance, we were looking at some engines in the engine room and people were describing what planes used those engines as well as the idiosyncrasies of the particular engine. I would not have known that. I would have looked and said, "That's interesting. I wonder what it is?" Then moved on to the next thing.

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Amidst the Military hardware was a few homebuilt experimental aircraft. Nestled beside the B-17 Chuckie was a BD-5. Hanging from the rafters was a homebuilt canard aircraft. They also have an engine room that has a dozen or more engines ranging from huge radials to jet engines.

This is a real neat museum. It doesn't have the hands off polished presentation that Cavanaugh has. This is a place where you feel like you're just wandering into someone's hangar that has a lot of history parked inside. You can get up close and really take a good look. You get the feeling that any minute the doors might open and the plane pushed out for its next mission.

## My Engine Experience

By Michael Stephan

In the newsletter I try to mix the technical with some inspirational and sometimes some comical. Well, I was telling my engine story to a few people and they said that would make great newsletter fodder. So here is my story.

The story starts at Oshkosh with Jerry Mrazek wandering around the vendor booths at Oshkosh. This was his first Oshkosh so he was trying to take in all he could. He noticed the Superior Airparts display, and knowing I was considering an XP-360, he thought he would pick up a little literature. In the short conversation with the sales rep, he found out that there was an Oshkosh special that reduced the price down to \$19,290. After arriving back in town, he called me to relay

the information. Skeptical at first, I decided to make the call to Superior and find out what was included in this special price. Were the accessories included, or did the price only include a crankshaft and four pistons? The salesman I spoke with, who shall remain nameless, said the price included everything required to run the engine. So, the items not included were the alternator and the vacuum pump. Now we're talking. I don't need a vacuum pump for my EFIS panel and I can find an alternator in my price range. So, I asked how long the special price was going to last. He said, "till close of business on the last day of July." That was in thirty minutes. I told him, "don't leave. I will be there in thirty minutes." I grabbed my checkbook and out the door I ran. When I got there they had just locked the doors. Pacing a bit, I knocked on the door and waited. Knocked again. Waited. Did I miss that bargain by a few minutes? Finally the salesman answered the door. After confirming the details of the engine, I plunked down my \$1000 deposit. Since the price was well below what I had budgeted for an engine, I decided to spring for the certified Lasar electronic ignition system. The price was high I thought, but the salesman said I could have the unused mags. That helps.

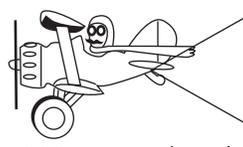
A month passed when I got a call from Superior saying that they were putting all the Oshkosh orders into production and needed more detail concerning the installation and sensors for the Lasar ignition harness. Up until then I couldn't tell you the difference between a thermister and a thermador. I did some research (asked Mel Asberry) and replied to Superior with my requirements. Now my engine build was underway. I figured the kit would ship to Aerosport Power, who Superior subcontracted to build the engine, and in about 6 weeks I would be hanging my engine. Not so. I called about October inquiring on the engine's status and the reply was, "Oh, we haven't shipped that kit yet. We are still waiting on the Lasar harness. We only ship complete kits." OK. Setback. No problem I have plenty of other tasks to work on, and who knows the Stock Market might come back a little and I might have a few extras dollars. It didn't.

Finally that phone call arrived. The call from the accountant



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at Superior that said, "Mr. Stephan your engine is ready and we need final payment." That was a roller coaster emotion. Good news, the engine is ready. Bad news, your wallet will be sore for months. I asked if they were going to ship the mags as well and they had no idea what I was talking about. It turns out that the salesman who promised them to me no longer worked there, and since I had nothing in writing I figured that was a battle I would surely lose. So, I filed that complaint into my barrel of bitterness. The next morning I arrived at the offices of Superior Airparts and proudly stood in the lobby with my cashier's check waiting for some one to trade it for a "paid in full receipt." It must have been a busy day there, because I stood there for quite a while. Finally, an accountant asked what I needed. I whipped out that check and said, "an engine." After a few minutes of searching for my order and a few trips to the copy machine, I insisted on and received a piece of paper that said they had received payment for my engine. They would mail the official receipt to me in a few days.

I couldn't wait till the engine arrived. A week later I got the second call. "Mr. Stephan, your freight is sitting here on our dock. You may come and pick it up." And pick it up I did, all 450 lbs of metal and crate (actually a forklift did the lifting, but I drove it home.) I uncrated it, and stood in awe of this beautiful piece of artwork that would someday whisk me though the sky like a god from Olympus. Sorry, a little over the top there. But it was a nice looking engine.

I purchased a prop governor, following the advice of Marvin Brott, who said it was easier to install the prop governor before mounting the engine. With a little planning, I arranged to borrow an engine hoist from a friend for a day and have Jerry and Marvin help me hang the engine on the airplane. So the afternoon before Jerry and Marvin were to come over, I started to install that other expensive piece of equipment, the prop governor. The directions said to line up the spline of the

governor with the spline on the back of the engine. I looked at the back of the engine. What spline? There is only an empty hole there. That's not going to work. So I looked through the documentation that came with the engine. I started to get a little nervous when I stumbled across the kit's parts list and it said that the prop governor adapter was not applicable. It should be. I ordered an engine for a constant speed prop and

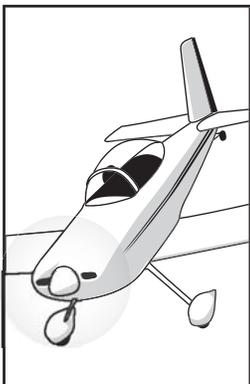


have the paper and now a receipt to prove it. The manual also said the engine was the O-360 A1A2. I didn't know what that meant, so I scoured all the papers I ever collected from Superior. There it was the O-360A1A2 is the fixed pitched version. They built the wrong engine. I checked my invoice and it definitely read O-360 B1B2, which is the constant speed version.

In a total frustrated panic I called my friend and canceled the engine hoist. I wasn't hanging that engine. How long would it take to get a new engine? Not another 6 months I hope. I called Marvin to let him know of the problems I was having. He talked me down from the ledge and looked in his Lycoming maintenance manual and said he thought it was probably an easy conversion. He said he would bring the manual with him when he came over the next day.

The next morning, Jerry, Marvin and I studied the engine. Marvin pointed out that all I was missing was the prop governor adapter, the oil line, and the plugs in the hollow crank would have to be changed. That doesn't sound impossible. I then called the fine folks at Superior ready for a fight. When a technician came to the phone he asked a few questions. "Do you have a prop governor?" "No." "How about a oil line to the front of the engine?" "No." "Is there a plastic plug in the front of the engine?" "No." "You have the wrong engine." I figured that. "Let me call you back with the solution." He called back an hour later and said he would send two A&P mechanics to my shop the next morning to do the conversion. The next morning they arrived, and in about an hour I finally had my O-360 B1B2. While they were here we chatted about homebuilts and they even offered a tour of their machining facility in Addison where the cases are machined from castings. He said it was all robot operated. I'll have to see this. So, I asked him if I could bring along a few friends, i.e. Chapter 168. He said sure just call and let him know.

Looking back, at this experience I learned a few things. Twenty Thousand dollars at an aircraft engine manufacturer isn't as powerful as the same amount at the local car dealership. Also, when Superior makes a mistake they are very quick to rectify the problem. My engine now is resting in its mount at the front of my RV8, waiting to bore some holes in the sky.



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