



Engineers' News

April 2015

Vol. LXXVII No.7

[www.FortWayneEngineersClub.org](http://www.FortWayneEngineersClub.org)

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## **April Tour – Postponed until May**

**Personal tour of in-progress RV-12 kit airplane**

Jim Stark's house: 9841 N 750 E, Ossian, IN 46777

Thursday May 7<sup>th</sup> at 7:00 PM

Jim Stark (father of current FWEC Treasurer Ryan Stark) is building a kit plane in his garage. The plane is an RV-12; a two-seat, low wing all aluminum aircraft made by Van's Aircraft Company. This aircraft kit can be purchased in parts and Jim is on the third part. The first was the tail and empennage, and second kit was for the wings, and the third is for the fuselage. Pizza, chips, beer, and pop will be provided and there will also be a bonfire going in case it gets cold.

See this link for more info: <https://www.vansaircraft.com/public/rv12.htm>

Directions from Fort Wayne: Take Winchester Road to the town of Poe. In Poe, turn Right on Poe Road (the last road before you leave town) and head south into Wells County. In Wells County, once you pass 1000 N, look for a large blue house on the East side of the road. A white MINI Cooper will be parked by the end of the driveway.

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## **May Tour**

**BAE Systems, Electronic Systems**

Thursday May 21<sup>st</sup> at 4:00 PM (note the earlier tour start time)

BAE Systems ([www.baesystems.com](http://www.baesystems.com)) is a global defense, aerospace, and security company employing around 88,200 people worldwide. BAE's wide-ranging products and services cover air, land, and naval forces, as well as advanced electronics, security, information technology, and support services.

In May 2014 BAE Systems broke ground at its new Fort Wayne facility; the FWEC will have a chance to tour the new building.

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## **Open Board Positions for the 2015-2016 Membership Year**

The FWEC will have open positions for the next membership year. Open positions are available for a vice president and two 1st year board members. The vice president assumes the president role the following membership year. 1st year board members would serve their first of three consecutive membership years in 2015-2016. Board members are expected to attend monthly board meetings that generally occur on the first Tuesday of the month on the Indiana Tech campus. Help determine future FWEC tour venues and shape the direction of the club! More information about the board can be found in the FWEC constitution (<http://fortwayneengineersclub.org/constitution.pdf>) or by contacting us at [info@fortwayneengineersclub.org](mailto:info@fortwayneengineersclub.org).

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## **Fort Wayne Regional Maker Faire**

The Fort Wayne Regional Maker Faire® (<http://makerfairefortwayne.com/>) is scheduled for August 8 & 9, 2015. This is the fifth Faire to be held at the beautiful Headwaters Park East - Lincoln Pavilion.

This family friendly event is so unique. It combines traditional fair fun like entertainment throughout the weekend, and handmade items and local food for purchase, with the rare chance to see projects from Makers of all kinds and from a wide variety of backgrounds and disciplines. Makers who specialize in metal, wood, fire (we hope), electronics, fabric, paper, and more will be there. The motto is one of everything and five of nothing at Maker Faire Fort Wayne.

Guests get to try their hand at welding for free; learn basic soldering techniques (for a small fee), see weird vehicles, "ride rides", Make & Take things, and have all kinds of fun. As importantly, Makers will be making at Maker Faire or at least help folks

understand tools, materials and tricks used in their special projects. Everyone who comes walks away with smiles on their face and the desire to make something new.

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## **TekVenture Open House Report**

FWEC Vice President Rod Vargo attended the TekVenture Open House and provides the below report.

TekVenture held an open house March 13th, 2015. They relocated last year to 1800 Broadway, just south of the GE complex. (See also [www.tekventure.org](http://www.tekventure.org).)

TekVenture is a volunteer organization intended for people of all ages who want hands-on contact with technology or engineering. It is a great place for young people wondering about engineering as a career. Few places offer such easy direct contact with equipment, experience, retired engineers, and generous space.

The building had been a vacuum cleaner sales and service business, which now provides internal spaces seemingly ideal for TekVenture's vision. A former showroom is now a bright and airy "Rapid Prototyping Center" that continues their long tradition of 3D printing and scanning, including guiding folks in building their own printers if desired. Other equipment readily available includes the vacuum-forming that we routinely see as packaging for just about any small items in stores. More possibilities are laser engraving and cutting, CAD/CAM, digital drawing and design, various aspects of sewing, basic circuit boards, and microcontrollers. (Some years ago, learning correctly from TekVenture helped "solder" my son's interest in engineering, literally and figuratively.)

A large area of the building is excellent for tinkering with vehicles of various descriptions. Adjacent space is specified for woodworking and machining, simple introductions to which again helped guide my son years ago. There is space designated for robotics and a group potentially meeting every third Monday evening (see website). A separate room has been set aside for hot work, such as welding, which will likely develop in part around participants' interests.

This seems a tremendous opportunity to explore and interact with informed and supportive people, essentially analogous to a clubhouse or gym for engineering and technology. Consider keeping an eye on their website as 2015 workshops and programs take shape, especially noting every Thursday at 7:00 PM.

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## 2014-2015 FWEC Board Members

Below are the 2014-2015 FWEC board members. Board positions are crucial to the planning of tours and events for the FWEC. Please consult the FWEC constitution (<http://fortwayneengineersclub.org/constitution.pdf>) or contact us at [info@fortwayneengineersclub.org](mailto:info@fortwayneengineersclub.org) for information on specific duties on board positions.

### Current 2014-2015 Membership Year Board

President: Marna Renteria

Vice President: Rod Vargo

Treasurer: Ryan Stark

Secretary: Elizabeth Garr

1<sup>st</sup> Year Board Member: Mike Magsam & Jack Phlipot

2<sup>nd</sup> Year Board Member: John Magsam & Rob Cisz

3<sup>rd</sup> Year Board Members: Dan Delaney & David Momoh



*Fluid Power, Safety and Automation Specialists*

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## Engineering in the News

FWEC Vice President Rod Vargo summarizes some recent articles from The Wall Street Journal.

The front page of The Wall Street Journal on February 25th carried an article entitled *Jobs And the Clever Robot*. Faculty at the Massachusetts Institute of Technology had routinely gathered to debate the impacts of their technologies and economic outlooks on employment. The view had long prevailed that technology replaced low-paying

and/or undesirable jobs with at least as many better jobs. But, the implementation of automated vehicles worldwide has exceeded what these economists and automation experts thought possible. They feel we may have crossed a tipping point into a realm of fewer jobs. If true, the option exists to continue providing more wealth (implying for everyone) with less labor.

The article indicated that automated mine trucks and drills in the Australian Outback generated more need for network technicians and combined electrical-mechanical engineers. The same is proving true while implementing automation of the ore trains that travel 300 miles each way to/from the coast.

The March 6 Wall Street Journal carried a poorly entitled *Self-Driving Cars Imperil Body Shops*. The story was really about differing views of the probable paths and timetables leading to widespread use of partially or fully autonomous vehicles. It reported that a leap occurred from 2013 passenger cars to 2014 models in implementation of driver assist systems deliberately aimed towards eventually supplanting the driver, initially on non-congested freeways in reasonably good weather. The article stated that most predictions range 5 to 15 years for widespread use of driverless vehicles, although a few well-informed skeptics indicated that broad adoption would not occur.

Insurance companies will continue to shift from driver profiles to vehicle safety profiles, particularly technical failures. (CBS News reported last month that NHTSA lists three recent car models with zero fatalities so far.)

Related trends mentioned in the article include a shift from ownership of vehicles to pay-for-use. Per other Wall Street Journal articles, most all-electric and hybrid-electric vehicles are already lease arrangements, glutting used electric vehicle markets with after-lease vehicles (except for Tesla, which produces few vehicles), plus Uber and ZipCar "car sharing" systems have proliferated in many of those same urban areas.

The March 6th news story indicates that the field of robotics in general should accelerate because driver assist systems and their high underlying costs are driving use of common components. According to an earlier article, costs have already dropped dramatically, such as from \$65,000 to \$12,000 - \$18,000 per Lidar on Google type vehicles. Four are the minimum per vehicle, but the report detailed various systems and combinations being researched across the passenger car industry worldwide.

These kinds of articles lead people to ask me where sustainable jobs might be. Multinational corporations across much of the United States, certainly in Indiana, seem

to face similar personnel needs as in the Australian mining story. Also, suitable technicians for industrial grade electrical and mechanical maintenance are said to be in short supply. While boiler and steam operations are being automated, inspection services seem chronically short handed (most are aging former Navy servicemen). Fort Wayne/Allen County posted an Employment Opportunity in their joint Planning Department for an engineer with some level of both electrical and civil training. Various personal sources indicate there is wide need nationally for specialists or engineers who enjoy or do not mind writing computer and electronics code. Most (not all) contacts report that coding is strongly disliked by most of the people who can do it at the depths and detail needed, leading to various personnel and logic problems. The PBS News Hour on March 12<sup>th</sup> had a segment about a San Francisco tech company which utilizes the concept that non-white website coders think and phrase things differently than Caucasians. In the background, a huge mural on their open-concept office wall declared "Learn to Love Code".

Be careful with claims that skilled employees are scarce. For instance, figuring out how to get people to enjoy writing (and staying technically current with) code might start with humane workweeks. No joke.

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## **FWEC Membership**

The FWEC exists through funding of its membership. Please forward your copy of the Engineers' News to prospective members and encourage their attendance at tours. Remember, the FWEC is the best deal in town, annual membership is \$10. We offer free monthly tours September through May. Please be sure to recommend FWEC membership to your colleagues and friends.

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## **Advertise in the Engineers' News**

New for the 2014-2015 membership year! The FWEC will be selling advertising space within the Engineers' News. Advertisements are \$10 per issue and limited to ½ page of content. For submissions please contact [info@fortwayneengineersclub.org](mailto:info@fortwayneengineersclub.org).

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## **March Tour History**

The March tour history is provided by FWEC Vice President Rod Vargo.

Twenty-five FWEC members attended a tour of 80/20 in Columbia City on March 10<sup>th</sup>.



Four hundred people in 3 shifts are employed producing or providing a stunning array of pieces and parts for what they call full-size "Erector Sets". What we saw totally outclassed Erector in size, beauty, adaptability, function, and potential strength.

80/20 uses a supporting skeleton of proprietary extruded aluminum bars or tubes, typically anodized clear or black, which are mixed and matched as needed in a broad range of sizes (English or metric), lengths (up to 20 feet or 6 meters), thicknesses, and cross-sectional shapes (T-slot, square, double-square, triple-square, triangular, D, circular, solid or hollow bar, square or rounded edges, channels for rollers or drainage, and more). English (called "fractional" in 80/20 lingo) dimensions provide the most automatic and therefore rapid exact alignments between pieces. Pieces are typically ordered pre-cut, but users can order lengths of bar and cut their own as needed. No welding is used, allowing easy assembly and ongoing change.

Choices of metal and plastic fasteners are almost as varied and interchangeable as the skeletal pieces, including attachments to concrete or wood.

Spaces within the skeleton can be filled in with locally sourced materials, or 80/20 offers various meshes, wall panels, glazings, handrails, swivels or hinges, wheels, rollers, doors, shelves, floors, and more. Protective and/or decorative trim can be added. All of these choices reflect 80/20's years of experience with durability and factors such as deterioration from sunlight.

The range of possibilities (and design/materials experience) that we observed included aviaries (common, and potentially walk-in), chicken pens (?), yard greenhouse (or shed), shower stall, atrium for a commercial entry/exit door (to control heat/AC loss), toilet stall, essentially dust-proof walk-in display case, various smaller display cases (usually on wheels), folding worktables/desks on wheels, racks for very compact storage of file boxes, a work table "gurney" on wheels which folds in/out of a pickup (or van) with tools already attached, dollies, industrial worktables and shelving, various tool holders, air distribution manifold, bins, industrial machine guards, custom cubicle walls/assemblies, indoor work or isolation rooms, bookshelves, exterior window assemblies, railing and stairway assemblies, handrails, ramps, light bars, and raised floors/stages. Visit their website for a more complete overview ([www.8020.net](http://www.8020.net), also available as a printed catalog or various pamphlets). They also have relationships with Amazon (often kits) and eBay (generally scratch, dent, and oddball items, and aluminum shavings for melting into hobby R/C castings).

80/20 can provide anything from individual pieces to finished assemblies, starting with almost anything from individual drawings to thousands of suggestions already detailed on their website. They have complete or partial kits, the most significant variations

being due to shipping costs. Orders can also be picked up at the Columbia City facility alongside Route 30.

Most everything is suitable indoors or out, but keep in mind that aluminum is sensitive to salt. All anodizing, regardless of source, is rapidly eroded by weather. The underlying aluminum tends to be durable except for salt exposure. Life expectancy of the structural bar in contact with soil is unknown, but probably a long time in most cases. Most outdoor 80/20 projects are mounted on patios, concrete, brick, or other materials. A FWEC member suggested nonconductive "rubber" between the aluminum and soil or masonry.

Machining of aluminum into specialty parts is readily available, as are various colors of anodizing. Aluminum is 2 to 3 times as expensive as steel or many other materials. But, it is more durable, light-weight, adaptable, corrosion resistant, and generally attractive long-term. 80/20 has evolved and constantly grown since its founding in 1989 based on what works well in use. They have a substantial workforce and distributor system nationally.

Their facility includes a pleasant showroom intended for anyone to tinker with pieces and fasteners on display. It is open during normal business hours, but other times may be suitable because 80/20 has Design Support staff onsite from 7:00 am to 7:00 pm weekdays to service specialists coast-to-coast. The building and classroom auditorium were eye-catching and notably clean (throughout, even the extensive factory floor drew favorable discussions).

80/20's founder still comes to work daily. He was originally a PHD Inc. salesman but PHD figured it could only manage so much growth. FWEC tours this year indicate both companies are still managing remarkable growth and innovation, based on multiple facility expansions over the years, filled with activity. They clearly appear to be ongoing leaders in their respective businesses despite chronic worldwide competition.

A sincere THANK YOU to our hosts and 80/20 in general. We strongly encourage FWEC members to explore the [www.80/20.net](http://www.80/20.net) website!

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## **Autodesk Design Software**

FWEC secretary notes that Autodesk, an engineering and maker software firm, has design software that may interest the membership. 123D ([www.123dapp.com](http://www.123dapp.com)) is a family of apps that cater to the Maker. Many of the apps have a focus interrelated to 3D printing. The various apps are suitable to adults or children. These apps are free to



everyone.

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## **FWEC Board Meetings**

Fort Wayne Engineers' Club board meetings are open to all FWEC members. The next FWEC board meeting will be Tuesday May 12<sup>th</sup> at 7:00 PM. Board meetings are held on the Indiana Tech campus in the Academic Center in room ACC-201 (<http://www.indianatech.edu/wp-content/uploads/map-color-large.png>).

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## **Engineers' News Past**

The FWEC has a significant history; Treasurer Ryan Stark and his wife were able to find past Engineers News documents dating back to 1938! Here is an excerpt of the past newsletter (a scanned copy of the entire newsletter is available through the FWEC website): [Engineers' News from April 15<sup>th</sup>, 1944](#)

### **BATTLE LINE OF THE SKY**

They marched down the broad aisle – hundreds of them – men and women – black and white – young and old – fighters on the battle line of the sky.

They came from all parts of the tremendous building covering almost twenty acres and filled brimming with the hum and roar of some of the most modern machines in the world devoted to the building of the turbosupercharger, one of the principle reasons for the rapid succession of the American Air Victories.

These men and women are fighting, not with bayonets and rifles but with skilled hands controlling delicate machinery capable of exactness which is almost incomprehensible to the layman. Stay-at-home warriors that they are, their skill – and certainly their hearts and hopes – ride with the Fortresses and the Lightnings on a dozen bloody battle fronts. The product of their long hours of labor – the turbosupercharger – allows thundering engines to breathe above the clouds to the crescendo of chattering machine guns and the roar of cannon

...continued online in the scan of the original issue...

## **Waterways, Wetlands and You**

Thursday, May 14, 2015 at 1 pm

at Allen County Public Library  
900 Library Plaza  
Fort Wayne, IN 46802

Please join the Corps Regulatory Staff for this outreach event that will provide an overview of the Regulatory Program for work in waterways, wetlands, and along shorelines.

[\*\*View the Flier\*\*](#)

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