Fort Wayne ENGINEERS' Club

www.**FortWayneEngineersClub.**org

Engineers News **February 2015 - Vol. LXXVII No. 6**

February Presentation

Freedom Firearms
Thursday, February 19th, 7:00 PM
1525 Directors Row, Fort Wayne, IN 46808

Marc Schroeder agreed to host the FWEC February meeting and provide an informational session on firearms and ammunition. Marc will have a firearms expert address the club and explain various rifles, pistols and ammunition. Any members interested in shooting will be required to sign a waiver and as a courtesy to our host **must purchase ammunition and targets from Freedom Firearms** if used on tour night, so arrive early to get your supplies. Eye and ear protection are required on the range.

We are limited to a maximum of 30 attendees. If interested in attending, you must RSVP to attend for the Freedom Firearms tour. Please limit reservations to club members only. RSVP to FWEC Treasurer Ryan Stark via email with FREEDOM TOUR in the subject line at: info@fortwayneengineersclub.org or call at (260) 456-0809.

Freedom Firearms is the region's largest firearms dealer. Whether looking for personal protection, concealed carry handguns, a new rifle or shotgun, you will find it at Freedom Firearms. They carry a huge selection of handguns and rifles as well as a number of unique guns to fill that collection. Their sales professionals are seasoned veterans, many with extensive military and/or law enforcement experience. For more information on Freedom Firearms, please visit their website: www.freedomfortwayne.com

Northeast Indiana DiscoverE Engineers' Week Banquet

The Northeast Indiana DiscoverE Committee will be hosting their annual Engineers' Week banquet on Saturday February 28th at Indiana Tech's Seitz Conference Center (rooms 206 and

207) within Andorfer Commons. The banquet presents local engineering students with academic awards (some sponsored by FWEC members and other sponsored by other local engineering societies and businesses). The banquet will also have a featured speaker, Jon Rowe from MSKTD, and is where the Citizen Engineer (more information found within this newsletter) is presented with their award.

Reservations for the banquet are due by February 20th to Nancy Burkey (nancy@rlguimont.com). The cost is $25 per person. Please see the Northeast Indiana DiscoverE website for information on the banquet menu options: http://discovere.in/engineers-week

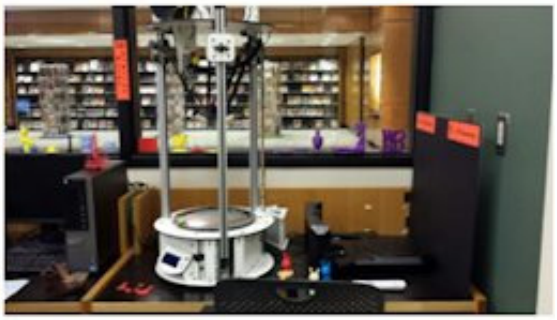
The Maker Labs at the Allen County Public Library Want You!

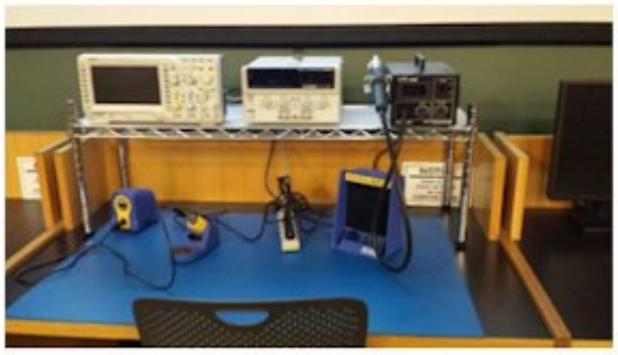
The FWEC has received a request from the Maker Labs at the Allen County Public Library (http://www.acpl.lib.in.us/home/maker-labs). They are looking for FWEC members for input and participation on a Maker Lab committee. This person could help find or could help with presentations and workshops regarding engineering technology for youth or adult audiences. Workshops are one to two hours in length and are open to ages 16 and up.

They would like to incorporate workshops where library patrons can invent, create, and participate. They also encourage groups to meet up at the library and use our Maker Lab for meetings, club events, etc. Their goal is to inspire potential Makers into the field of Engineering.

If interest in learning more about the Maker Lab and perhaps volunteering your talent or time please contact Ray Young (ryoung@acpl.info).

“To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science.” Albert Einstein





2014-2015 Membership Dues

Please note that any member not yet having paid their 2014-2015 membership year dues is now delinquent. Delinquent members will be receiving a notification from Treasurer Ryan Stark via e-mail. Any member with questions regarding their dues status should contact Ryan at info@fortwayneengineersclub.org.

In Memoriam

The FWEC would like to remember Richard E. Seely.

March Tour

80/20 Inc.
Thursday, March 10th at 7:00 PM
1701 County Road 400 East, Columbia City, IN 46725

FWEC President Marna Renteria has arranged a tour of 80/20 (http://www.8020.net) for the club. Please RVSP to Treasurer Ryan Stark at info@fortwayneengineersclub.org. Upon reservation you will be sent a copy of the 80/20 Visitor Safety Guidelines and the Visitor's Non-Disclosure and Waiver Agreement. Please bring a signed copy of this agreement to the tour to help speed things along at our start.

80/20 is a T-slot aluminum system you use to build virtually anything. When you think of 80/20, think of an industrial "erector set." You mix, match, assemble and reassemble our products to create your customized solution or innovation. We have been in business for over 25 years operating on a campus of over 300,000 square feet. 80/20 Inc. has both a national and international presence with customers in practically every industry. Anybody can use our product; from machine frames, robots, desks, material handling racks, 3D printers, trade show exhibits and beyond, there are no limitations on what you can create. 80/20 provides modular solutions to advance ideas and implement designs. 80/20 Inc. is located at 1701 South 400 East, Columbia City, IN.

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 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
1st Year Board Member: Mike Magsam & Jack Phlipot
2nd Year Board Member: John Magsam & Rob Cisz
3rd Year Board Members: Dan Delaney & David Momoh

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 with monthly tours at $10 per membership year. Please be sure to recommend FWEC membership to your colleagues and friends.

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 page of content. For submissions please contact info@fortwayneengineersclub.org.

January Tour History

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

Jon Rowe of MSKTD gave a wonderful presentation about their engineering work for the Ash Skyline Plaza development underway in downtown Fort Wayne. This is a combination of several projects, unusual for the Fort Wayne area in being legally classified as a high-rise building and in having different legal owners for different sections of the structure. Such work is common in Chicago and New York City.

The main 142 foot high-rise will rest on over 1300 deep pilings and have one level of basement, a ground level for conventional storefronts, four floors of parking garage, four floors for Ash Brokerage, and a covered penthouse for utilities. The ground-level footprint will cover half a city block and provide a partly covered two-lane alley with entrance on Berry Street and exit on Wayne (one-way, going east). The sixth floor, essentially the roof of the four-story parking garage, will have covered terraces on the north and south, a landscaped rooftop "Skyline" plaza on the west (alley side), and 35,000 feet^2 of open-concept office space centered along the eastern frontage (Harrison Street). An additional three stories of roughly 22,000 feet^2 each will be topped with the utility penthouse.

The main pedestrian entrance on Harrison Street, near Wayne Street, will be an open atrium for all levels except the basement and penthouse. The building will be steel and concrete with floors supported by outer walls and multiple inner elevator/utility cores. Much use will be made of precast concrete. The elevators will each have electric motors, largely eliminating the old-

fashioned elevator wells and head houses.

The use of a single level basement helps avoid groundwater problems. Water levels have also subsided, perhaps due to engineering required in the low-lying Allen County Public Library (another MSKTD design) and Parkview Field. Those projects included facilitating flow to the St. Mary's River via a former creek, long ago converted into a storm sewer.

The four floors of parking garage will be owned by the City of Fort Wayne and are slated to hold 1,200 parking spaces (06/12/14 data). Ash Brokerage expects to employ 315 people. A residential tower expected to adjoin the main Ash Skyline Plaza building is projected to have 75 spaces for residents. Previous street parking (or traffic lanes) will be eliminated in most locations by a wider sidewalk and cut-outs for vehicles to pick up or drop off passengers. Deliveries, access to the parking garage, drive-up banking, and other activities are designed into the two-lane alley.

Starting with 12,400 volt feeds, the main electrical supply within the building will provide 2000 amps at 480 volts along a "bus" running vertically from basement to penthouse. The bus will be composed of copper bar rather than aluminum primarily to conserve space. About 1400 amps of that feed will be needed in the penthouse for 400 tons or 7100 MBH (thousand BTU/hr) of HVAC (heating, ventilation, and air conditioning). Overall, the amount of electrical power needed for spaces occupied by people have been reduced, along with heat loading, by perhaps 70% due to modern features such as LED lighting.

This structure will have over 1600 linear feet of LED lights. There will be occupancy sensors throughout. Occupancy and other sensors will feed information to a programmable central unit which will learn and adjust to use patterns in various portions of the building. Three of the uppermost floors will have raised (often called false) floors to provide flexible room for ductwork, electrical, high speed cables, and other utilities. Expensive but adaptable open-concept office furniture is being used to better sync with the flexibility under the floor. Only three floors are being designed this way because Ash Brokerage views the sixth floor as expansion and experimental space.

The building will probably not apply for LEED status but would readily qualify for silver certification. MSKTD designed the Sweetwater building, which has platinum ranking.

Ash Brokerage has opted to install expensive Cat 6a Ethernet shielded cable (twice the capacity of Cat 6e) and will use over 100,000 feet of it. Part of the reasoning is to optimize communications with field offices. The upgrade will also probably assist with ongoing changes in technology. The cabling system will incorporate the "smart building" type systems such as occupancy sensors, lighting, HVAC usage, emergency generators, and automatic responses to events such as smoke or fire. Alarm systems include automated verbal alerts and instructions.

The Ash Brokerage portion of the structure will utilize noise canceling or masking technology. This will be similar to the "white noise" that FWEC experienced during our Franklin Electric tour last year.

The electrical grounding system for these large structures tends to use multiple pathways including a grounding loop around the perimeter of the building, the structural steel of the building, and water pipes.

The penthouse equipment will include multiple large AC units, heat exchangers, and a chilled water supply. By moving air up and down near the outer walls and central cores, the penthouse will serve extensive ductwork in the top four floors and also some systems in the parking garage. The parking garage and basement will have additional independent systems, particularly ventilation. The retail spaces on the first floor are designed for individually metered utilities including natural gas.

Ductwork in each of the top three floors is essentially a ring at floor level along the outside walls,

which can be tapped into as needed under and through the raised floors. The sixth floor will have much of its ductwork in the ceiling. Overall, the repetition and amount of design work appears daunting.

MSKTD employed four mechanical engineers and four electrical engineers, plus a computer software technician (primarily CAD). Renderings of proposed buildings on paper or video screens have replaced physical models, but someone jokingly pointed out that 3-D printers are being used to print out building models. (Editorial note: A serious trial run is being conducted in Scandinavia with printing out sections of a real home and having the finished structure approved for habitation. The cost of materials is theoretically less, partially due to reduced shipping costs; the cost of labor is substantially less; and the environmental/climate impacts are potentially less.)

Our presentation largely ignored the residential tower which is undergoing changes in management and design. That tower is expected to have a footprint of a quarter City block and tie into the main Ash Brokerage development at the sixth floor level, via the landscaped open-air plaza. Otherwise, the semi-covered service alley will separate the two structures at ground level and above.

The other portion of this City block will remain occupied by an existing four-story structure with multiple office tenants and conventional parking lot.

A sincere THANK YOU to Engineers' Club and DiscoverE Committee member Jon Rowe of MSKTD for fighting a cold in order to share his inside view (and probably not the cold) of this fascinating work in progress.

Fort Wayne Coder Dojo

Fort Wayne Coder Dojo, a technology club for kids from ages 10 to 15, will meet in February on the 21st. See what they're all about on Facebook (https://www.facebook.com/pages/Fort-Wayne-Coder-Dojo/224411581074241).

Join them at INDIANA TECH's Zollner Engineering Center in Room Z103, the Software Engineering Lab (http://www.indianatech.edu/wp-content/uploads/map-color-large.png). They welcome visitors/explorers whether they be kids, potential mentors, or curious observers.

Northeast Indiana DiscoverE Committee

The Northeast Indiana DiscoverE Committee presents the Citizen Engineer award during their annual Engineers' Week banquet. The Citizen Engineer award honors those who have dedicated their time to furthering the Engineering cause and have contributed to society as a whole through various volunteerism activities. For additional information on the Citizen Engineer award please contact Northeast Indiana DiscoverE Committee member Jim Delaney at jimd3130@aol.com.

Experimental Aircraft Association, Chapter 2

The EAA Chapter 2 (http://www.eaa2.org/) will have its next chapter meeting on Friday March 13th at 7:00 PM. Larry Zepp will host a project tour featuring the fuselage construction of his Zenith Zodiac aircraft as well as the Viking 110 HP engine that will power the airplane. This meeting will be held at Larry's home: 2812 Trent Dr. Fort Wayne, IN 46815.

IPFW Opportunity Banquet

The 12th annual Opportunity Banquet hosted by the IPFW SWE chapter (http://www.engr.ipfw.edu/~swe/index.php) will be held on Friday March 27th, 2015 from 4:30 to 9:30 PM. The Banquet will be held on the IPFW campus in the International Ballroom WU 149 and 150 (https://www.ipfw.edu/dotAsset/734e1ea9-dc15-49b5-9c43-15e30c0f2639.png). The banquet will have a career fair and networking diner. The dinner will feature guest speaker former Astronaut Captain Robert "Hoot" Gibson. Advance tickets are required and are $30 per person. Tickets must be purchased by March 20th. Please contact Elizabeth Thompson at thompsoe@ipfw.edu for tickets and further information.

FWEC Board Meetings

Fort Wayne Engineers' Club board meetings are open to all FWEC members. The next FWEC board meeting will be Tuesday March 3rd 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). Note the new location, our meetings have moved from the Zollner building to the Academic Center.

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 February 15th, 1944

R.C. MUIR TO SPEAK

Roy C. Muir, General Electric's Vice President in charge of Engineering, will speak to the February 17th meeting of the FWEC. His subject will be "The Engineer's Position in Society."

Mr. Muir, who is a 1905 graduate of the University of Wisconsin with a BSEE, was given the honorary degree "Doctor of Engineering" by his Alma Matter in 1939 and was awarded the degree of "Doctor of Engineering" in 1942 by Manhattan College.

After graduation, Mr. Muir entered the student engineering course of General Electric Company and has been associated with that company continuously. He has served in the Design Engineering Department, Commercial Engineering Department, International General Electric Company, and on the staff of the Vice-President in charge of Engineering. In 1934 he was elected Vice-President in charge of Engineering and as such he is responsible for the operation and activities of the Engineering Department of General Electric Company.

He always has been active in the educational development and training of young men and chairman of the General Electric Education Committee which directs the recruiting of technical and business graduates. He also guides the extensive training and educational activities through

which his company develops its personnel.

He has been a member of the New York State Regents Council on Apprentice training for the past eight years and a trustee of Union College. He is a member of the Board of Education, City of Schenectady, NY.

Mr. Muir is active in the American Society of Mechanical Engineers. At one time he was chairman of the Schenectady chapter of the AIEE.

The meeting will be held jointly with the Test Engineer's Club of Fort Wayne. Mr. Muir will speak briefly to the Test Engineers immediately after dinner in the dining room, and before opening of the regular meeting. Dinner will begin at 6:30 PM, the meeting at 8:00 at the Chamber of Commerce. The AIEE, ASME, SPE, the Chemists Club, GE Squares and Indiana Technical College Undergraduates are invited to attend the 8:00 meeting.

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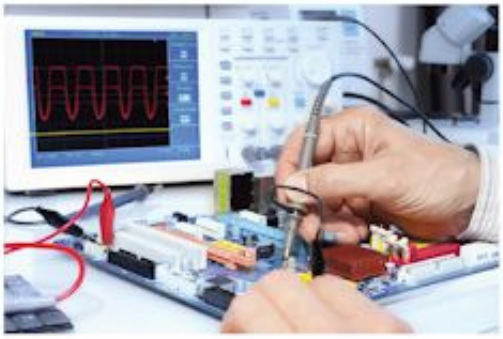
Zuno is an electrical engineering services company. We specialize in the design, build, integration, test & support of systems; from complex to simple and everything in-between. Understanding the objectives that drive a project allows us to create designs that are intuitive and easy to use. Our talented and experienced engineers have a broad range of skills in electrical, mechanical and systems engineering. We focus in industrial control, circuit design, image/signal processing, machine vision, and embedded software solutions.



SKILLS

Comprehensive | Customer Centric | Expertise

Electrical Engineering

- Microcontroller Circuit Design, Programming and System Integration
  - > Brands
    - Microchip
    - Atmel
    - ST
  - > Development Tools
    - MPLABX
    - Atmel Studio
    - IAR Workbench
- Schematic Capture and PCB Layout
  - > DipTrace
  - > CadSoft Eagle
  - > Altium Designer
  - > Mentor Graphics PADS
- Image and Signal Processing
  - > Digital Signal Processing
  - > Image Correction and Feature Detection
- Control Systems
  - > Opto22 PAC Project Pro
  - > Groov web based industrial HMI
  - > EMU (Energy Monitoring Unit)
  - > Cognex
  - > Machine Vision Systems
- Simulation and Modeling
  - > Using Matlab / Simulink, Python
- System Instrumentation and Testing
  - > Utilizing National Instruments Equipment and LabView
  - > Full Suite of Test Equipment

Mechanical Prototyping

- > 3-D Printing Capability for Rapid Prototyping and Proof of Concept
- > Expert level CAD users
  - AutoCAD

Contract Manufacturing

- > PCB Assembly and Test
- > Light Mechanical Assembly
- > System wire harness prep and assembly
  - Schleuniger 9500

SERVICES

INDUSTRIAL CONTROL

We are a distributor and system integrator for Opto22. We have used Opto22 hardware and software for many industrial control applications. We can integrate Opto22 with most industrial control systems including Allen-Bradley. We also develop intuitive HMIs for easy machine operation.

We provide a multitude of services and roles. We can design a complete control solution from scratch; hardware, control software, HMI and installation of hardware. Or, we can provide just a partial solution if your engineering team would like to tackle some of the design.

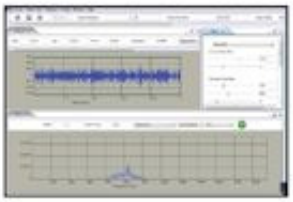
We also support and service existing systems. If you have a legacy system that you need serviced, repaired or even redesigned we can provide that service on site or remotely.

EMBEDDED SOFTWARE

We can implement virtually any embedded software solution. We have had experience ranging from 8-Bit microcontrollers programmed in assembly to 32-Bit ARM processors running embedded Linux, and everything in-between.

The photo to the right is a product we designed for a customer to thermoform high end boot liners for the snow and water sport industry. This design implements an integrated 120/240 VAC power supply, microcontroller, sensors for temperature feedback, and a user interface to control two heater units.

SIGNAL PROCESSING



Our engineering staff has a strong background in image and signal processing. We have developed many signal processing solutions, from military applications for image processing, to industrial solutions for machine reliability. We typically implement prototype algorithms in Matlab or Python using modeled or captured data. We can then port those solutions over to an embedded solution, or work with our trusted software development provider Enspire Software to develop a standalone application.

CIRCUIT DESIGN/PCB LAYOUT

At Zuno we can transform your idea into a final product, starting with basic system requirements we can design your circuit, capture the schematic and layout the PCB. We also can produce the populated PCB and test the product before delivering to you for final review.

We can interface to virtually any sensor, display or other IO device. In fact we have designed sensors for various industries including automotive and military.

www.zunoengineering.com

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