Fort Wayne Engineers' Club

Engineers' News February 2016 Vol. LXXVIII No. 6

www.FortWayneEngineersClub.org

February Tour

Ultra Electronics USSI
4868 Park 30 Dr, Columbia City, IN 46725
Wednesday, February 24th at 3:00 PM
****Note the date and time****

FWEC Vice President Dave Schaller has arranged our tour of Ultra Electronics USSI.

Ultra Electronics UnderSea Sensor Systems, Inc. is a defense contractor and requires that **all tour participants provide proof of US Citizenship**. Carefully read and understand the accepted forms documenting Proof of US Citizenship below.

Accepted forms documenting Proof of US Citizenship:

- Valid or expired U.S. Passport
- Valid or expired U.S. passport card
- U.S. State or local government issued Certificate of Birth
  - Hospital Birth Certificates are NOT acceptable as proof
- Consular report of birth abroad
- Valid I-551, permanent residence card issued by the Department of Homeland Security/U.S. Citizenship and immigration services. Non-expiring I-551 (issued 1977-1989) cards are acceptable

- US Certification of Naturalization (form N-550)
- Enhance Driver License (EDL) issued by the states of Washington, Vermont, New York and Michigan

Ultra Electronics - USSI is located in Columbia City, Indiana, USA. USSI is an industry leader in the design, development, and production of advanced electronics, electro-mechanical, and hydro-acoustic sensor and sensor systems for military, homeland security, and commercial applications. USSI is an innovator of sonar algorithms, surveillance systems, and signal processing solutions. USSI is a proven supplier of cost-effective sonobuoys for Anti-Submarine Warfare (ASW) platforms worldwide.

Since its inception, USSI has grown rapidly to expand its acoustic expertise. With the integration of AudioPack into its manufacturing facility, USSI now produces a variety of amplifiers and attachments for SCBAs and other mission-critical components. USSI also produces the revolutionary HyperSpike line of acoustic hailing devices, which holds the world record for loudest electro-mechanical speaker.

USSI supplies the United States Navy (USN) with sonobuoys through ERAPSCO, Inc. USSI exports USN-Specification sonobuoys worldwide under State Department approval through Sonobuoy TechSystems (STS). STS operates under ERAPSCO, Inc.

USSI is a wholly owned by Ultra Electronics Holdings plc, UK. Ultra is an internationally based group of businesses specializing in Aerospace and Defense. With over 50 years experience in the design and manufacture of innovative and advanced technology products, Ultra is a valued provider of industrial and military equipment.

Please Complete the Membership Survey

The Fort Wayne Engineers' Club is conducting a survey of its membership to better understand the desires of the club.

The survey is hosted through Survey Monkey and responses will be reviewed by the board with additional information posted in upcoming editions of the Engineers News. The survey will be active through February 29th.

Northeast Indiana DiscoverE

Engineers Week Banquet

RSVP by Monday February 15th

DISCOVER ENGINEERS WEEK

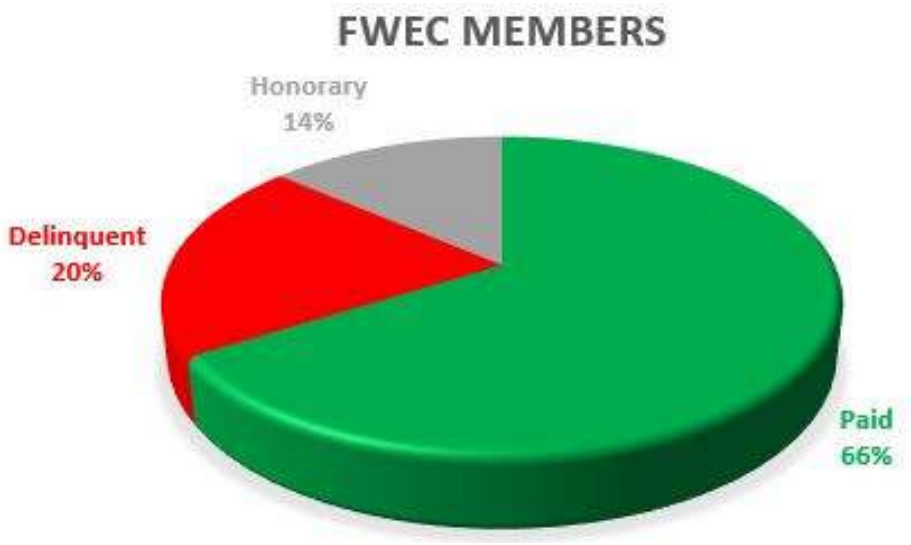
FEBRUARY 21-27, 2016

Northeast Indiana DiscoverE will be holding its annual Engineers Week banquet on Saturday, February 27th at the Walb Classic Ballroom on IPFW's campus.
Doors open at 6:00 PM with dinner served at 6:45 PM. Banquet tickets are $30 per person and are available online or via mail.

The Northeast Indiana DiscoverE banquet features:

- Master of Ceremonies - Sandy Thompson
- Featured speaker - Dick Teets President and Chief Operating Officer of Steel Operations of Steel Dynamics Inc
- Academic Award presentations to engineering students
- Citizen Engineer presentation
- Distinguished Service Award - Dan Ewing of the Fort Wayne Engineers Club
- Science Central and IPFW Bridge Building Contest highlights
- Future City program highlights
- Student/Engineer visitation program highlights

Membership Dues



Fiscal Year 2016 is now upon us and it is time to ensure that all members dues are current. **20% of the FWEC membership remain delinquent in the payment of their dues.** Treasurer Ryan Stark has sent first notices to members believed to be delinquent in their payment and will be sending second notices in

February.
Anyone unsure of their dues status can contact Treasurer Ryan Stark at FortWayneEngineersClub@yahoo.com.
Dues to the FWEC have remained constant in our ever changing economy at $10/year for full and associate members and only $5/year for student members.
Dues paid online are subject to an additional fee of $1 for processing.

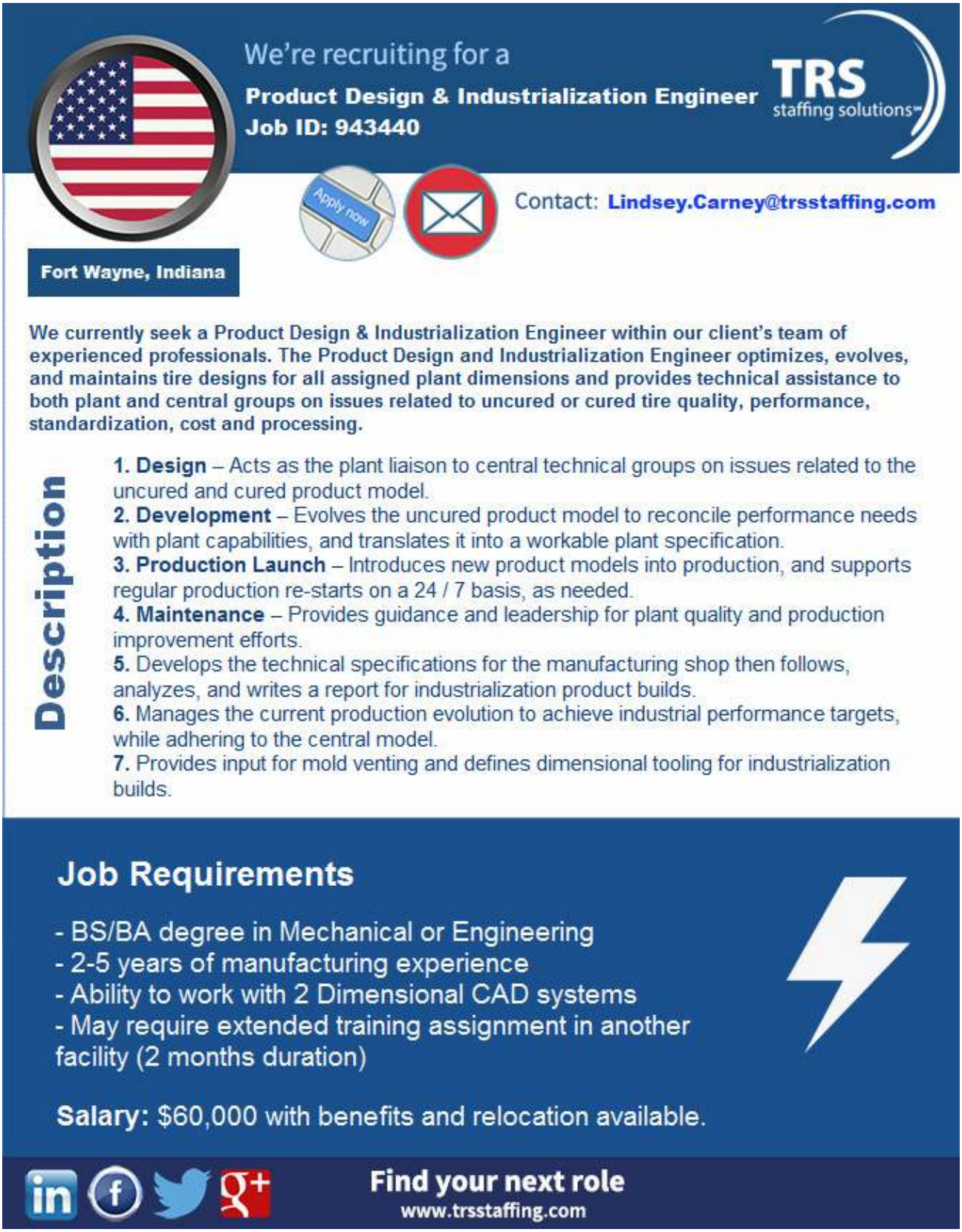
March Tour

VOSS Automotive
4640 Hillegas Road, Fort Wayne, IN 46818
Thursday, March 17th at 7:00 PM

FWEC Vice President Dave Schaller has arranged a tour of VOSS Automotive. The tour is in conjunction with the Fort Wayne Chapter of SAE.

In the automotive industry, VOSS stands for experience, quality and innovation in line and connection technology. VOSS Automotive offers an extensive portfolio of efficient system solutions for the international commercial vehicle, passenger car, and off-road vehicle industries.

In close co-operation with the customer, VOSS designs and optimizes lines and connectors in the vehicle systems of today and tomorrow.



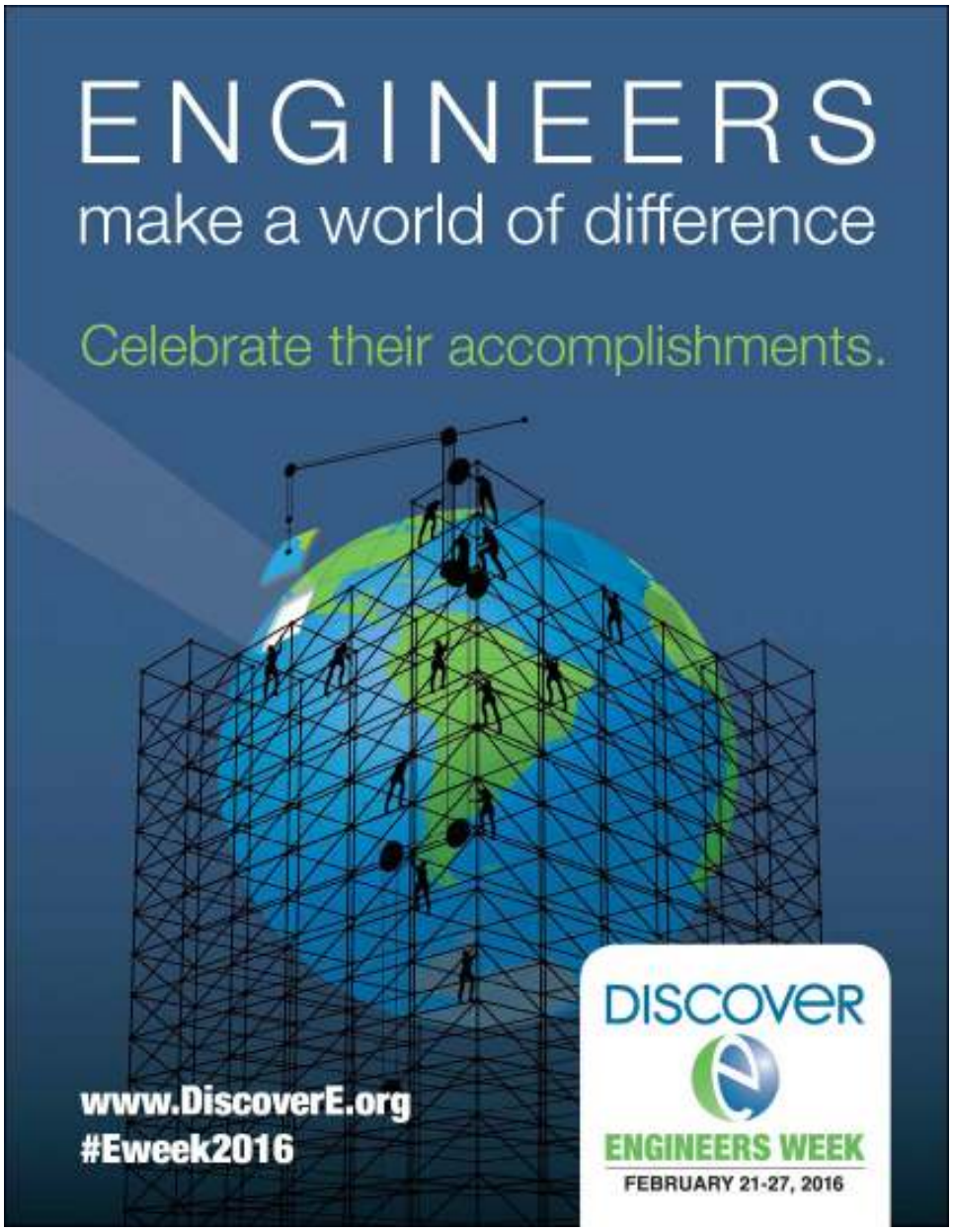
Join the FWEC on Social Media

The Fort Wayne Engineers' Club now has a group on LinkedIn®. This group is open to all existing and potential FWEC members. We'll post FWEC tour reminders, photos, tour discussions, and more on the

group's page.

Join our group : Fort Wayne Engineers' Club

Additionally, the Fort Wayne Engineers' Club now has a Facebook page.



2015-2016 Membership Year FWEC Board

President: Rod Vargo
Vice President: Dave Schaller
Treasurer: Ryan Stark
Secretary: Elizabeth Garr
1st Year Board Members: Marna Renteria & Ellsworth Smith

2nd Year Board Members: Mike Magsam & Jack Phlipot
3rd Year Board Members: John Magsam & Rob Cisz
Northeast Indiana DiscoverE Committee Chair: Jake Dinius
Resident Agent: Ryan Stark

Board positions are crucial to the planning of tours and events for the FWEC. Please consult the FWEC constitution or contact us at info@fortwayneengineersclub.org for information on specific duties on board positions.

Welcome New FWEC Members

The FWEC would like to welcome the following new members.

Full Members: Don Cox (BSME & MS Engineering Management) and Gene Stringer (BEE & MBA)
Associate Member: Michael Walsh
Student Member: Garrett Martin (Ivy Tech, Computer Science)

FWEC Board Meetings

Fort Wayne Engineers' Club board meetings are open to all FWEC members. The next FWEC board meeting will be Tuesday March 1st at 7:00 PM. Board meetings are held on the Indiana Tech campus in the Academic Center in room ACC-201.

Advertise in the Engineers' News

The FWEC provides 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.

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.

January Tour History - Sweetwater

FWEC President Rod Vargo provides our January tour history.

The January 28th tour of Sweetwater Sound was attended by 101 members and guests. Sweetwater gracefully adapted to the unexpected numbers, including the many who arrived early to purchase dinner or coffee from their central cafeteria and coffee shop (open to the public). Substantial meeting and greeting ensued.

Sweetwater's 246-seat auditorium is extensively designed to absorb all sound generated by the audience or performers, eliminating all feedback. The experience of a sound-dead space was ominous to those not familiar with the complete lack of echoes or feedback built into a recording studio.

Built as a recording studio, the auditorium is a concrete room built within a larger concrete room. The decorative walls and ceiling also have double walls and baffles intended to trap and absorb sound. Different types and sizes of extremely high quality speakers (perhaps sixty) and microphones allow a sound and recording technician to add back sounds. Some speaker boxes were deceptively large, nearly 6 feet tall. Effects ranged from dead silence to cavernous, and microphones were not necessarily needed anywhere in the space. A retractable back-projected screen filled the width of the stage, supported by a smaller flat screen on each side if needed.

Sweetwater has a larger and upgraded studio-auditorium underway to accommodate steady growth in staff since building in this current location in 2007. Its "Sales Engineers" now number about 500 individuals who meet weekly in two sessions due to the existing auditorium's size. Sweetwater also offers a free family movie night each month for employees, currently about 900. (Sweetwater outgrew expansions at their previous location in 20 years or less.)

Two additional state of the art recording studios are adjacent to the auditorium. The studio we viewed (from outside) looked more like a large well-lit living room space with wood floors and extensive use of utterly spotless glass panels for observers. All seating for performers and support staff were on Persian-style rugs. A large control room was located on the other side of an extensive floor-to-ceiling glass wall.

We spent considerable time in the control room, which had carpeting and additional extensive sound absorbent features on the walls and ceiling, most everything in basic flat black. The entrance was onto a raised sitting area, which overlooked a somewhat lower area at the same level as the performers' space. The lower area held a curved console capable of working three technicians, sitting back-to-back with a keyboard facing the sitting area.

The console was actually three consoles. A central one served general purposes. The left, farthest away from the performers' area, was for digital recording work, by far the norm. Up to thirty-six digital channels are available. The right hand console was for analog mixing and control, when requested. Virtually all output of the consoles is saved digitally, but old-fashioned 2-inch 24-track reel-to-reel analog equipment is an option.

Digital recordings with full analog detail would require astronomical amounts of memory. Normally, the difference in sound details is filled in to varying extents by digital compression software going into the memory media and then by decompression software coming out of the memory. Sweetwater still largely depends on conventional hard drives but expects solid state memory will soon complete the elimination of moving parts within most electronics, but certainly not all. The recording studio consoles were packed with

rheostat-like pots and slides.

Sweetwater's recording area also has a glass-faced Microphone Vault (small room) of various historical and modern microphone types for use, as well as a range of microphones in the studios and in its warehouse. Designs included reproduction spring-supported omni-directional boxes, apparently original 1960's Shure unidirectionals (which allowed modern multi-track recording, mixing, and stage performances), and modern types. Wireless microphones were originally inferior because the digital compression occurred after transmission to a base station, but now the compression can fit into the microphone. Newly released from Shure, a directional microphone head was demonstrated that noise-cancels returning background sound, eliminating effects (within reason) of how far away a performer is from the microphone's pickup "coil".

Sweetwater has nine craftsmen (luthiers) who do most anything from tweak to completely rebuild stringed instruments, mostly guitars. Our featured specialist was a "youngster" glad to have fully established himself in the trade after "only" fifteen years. He was spending three days disassembling and replacing/rebuilding an acoustic guitar from 1910, at a cost of about $3,000. He can readily reproduce veneer or entire necks. Three less experienced luthiers typically spend about an hour per guitar doing mundane fixes such as re-leveling frets. By far the most important long-term factor for guitars is maintaining a proper range of humidity.

A nearby workshop specialized in similar work on electronics such as guitar amplifiers, analog mixers, and general use analog amplifiers. The equipment usually dates 1970's or and newer, but can be 1920's. The most time consuming work involves recalibrating tubes to the equipment, followed by replacing dried out electrolytic capacitors. Replacement parts are still available, typically manufactured on a small scale in Eastern Europe. A few tubes must be sourced from around the world as custom-made or originals. (Soviet era military equipment preferred tubes for resistance to nuclear electromagnetic pulse.)

Electric guitarists often prefer primitive-style electronics due to the many orders of harmonics that arise from both the guitar and amplifier. Conventional "stereo" amplifiers filter out most second and higher order harmonics, also protect equipment by limiting amplitudes and feedback loops. (Sales Engineers have proven to match equipment including speakers to specific purposes.)

Sweetwater prides itself in testing and tweaking every guitar it receives (if priced $299 or higher). Roughly 10% are returned to the manufacturer, but the percentage of rejects varies greatly between manufacturers. A "55-point Evaluation" involves thirty-four full-time specialists working as a coordinated unit along an extended work area with eleven spacious stations. An equally long storage area holds the approved guitars but extends some four stories high in order to accommodate some 2400 types of guitars, about 9,000 units in stock at a time. In many cases, photos are taken so customers can choose wood grain and other individual details online, about 99% of sales. Sweetwater has one of the few machines globally to properly correct alignments of frets and strings. Humidity control is rigorous and may include special humidity packs inside individual boxes. Other details and checks are too extensive to include here, but are happily available

from Sweetwater.

The tour of the warehousing area was abbreviated due to the size of our crowd. Even the warehouse included a very large addition built within the last three years. The system seeming to extend upwards at least three stories including some stairs, railings, and roller-style conveyer routes spiraling down from above. Temperature and humidity control were reportedly rigorous. The area was spotless and mood upbeat, with employees clearly attuned to music. It seemed likely that many were musicians very pleased to have a steady job. The warehouse runs 24/7 during peak seasons.

Warehousing is coordinated with an extensive store inside Sweetwater's front door (open to the public). Essentially unique to Fort Wayne, the store offers an ability to walk in and leisurely explore an unusual range of musical equipment. Guidance from sales engineers is available if desired. A few other specialty shops include sheet music, apparel, and selling/swapping used equipment. (There is also an annual GearFest with a national following.)

This LEED certified building designed by MSKTD had surprisingly small utility areas. As needed during warm weather, three electrically-driven systems based on ethylene glycol produce ice at night when electric rates are low. A bank of twenty-one heavily insulated low-profile silos hold the ice and can then provide ethylene-glycol based cooling and humidity control. Three small natural gas furnaces can heat ethylene glycol to 150-155 degrees as needed during the winter. An expansion-contraction tank ties the system together. Even the utility areas were essentially spotless, partly because they seemed designed with adequate and safe accessibility.

A separate space provides enhanced water pressure as needed for various functions and locations. Because Fort Wayne's water supply plant is at a lower elevation, the 80-82 psi leaving the plant ends up entering Sweetwater at about 35 psi. Large input piping allows for sufficient incoming volumes even for fire response.

The extensive public lobby also houses various free games in a bright and airy environment. Tucked away in a stairwell near the dining area, a stainless steel spiral slide offers an alternative to using the stairs. This facility reflects remarkable growth arising from an atmosphere of very serious play and exploration.

Fort Wayne Coder Dojo

Fort Wayne Coder Dojo is technology club for kids of all ages but is now comprised of +/- 10 to 14 year olds who share an interest in Minecraft modifications. The next club meeting will take place on Saturday February 6th and 20th at 1:00 on the Indiana Tech campus in the Zollner Engineering Center room Z103.

TekVenture's "Making it Thru Winter Workshops!"

TekVenture is hosting a variety of "Making it Thru Winter Workshops!" Workshops are for Members and Non-Members, but there is a 20% discount for Members.

Workshop categories:

- Rapid Prototyping Center
- WOODWORX
- BOTZ & VOLTZ
- Safety & Operation
- GREENWORX
- TEK*GARAGE
- MACHINEWORX
- HOTSHOP

Information on all available workshops, dates, and cost can be found on TekVenture's Workshop site.

Fort Wayne Inventors Club

The Fort Wayne Inventors Club will have its next meeting at 7:00 PM on Thursday February 11th at the Brand Innovation Group (BIG). The BIG is located at 8902 Airport Dr, Fort Wayne, IN 46809.

During meetings FWIC members discuss our experiences–the successes, the failures, the aha's, and the oh-no's. We also bring in speakers to share what inventors need to know. The club is particularly useful as a venue to give inventors time to showcase their work and receive feedback about it from their peer inventors. We also point inventors to resources they need to be more effective and help them meet people to collaborate with on projects.

Fort Wayne Astronomical Society

Fort Wayne Astronomical Society, Inc. 1959
P.O. BOX 11093 • FORT WAYNE, IN 46855 • USA
FortWayneAstronomicalSociety.com

The Fort Wayne Astronomical Society will have their next general meeting on Tuesday February 16th at 7:30 pm at the University of Saint Francis Schouweiler Planetarium.

Observing Atmosheric Phenomena By Laura Ainslie

Laura took up amateur astronomy in March 1987 after some years of "armchair astronomy." Sadly, her 10-inch Dob doesn't get much use anymore, (though she balks at the idea of selling it, as she considers it part of the family). Her vision of reviving the Universal Observer, (a amateur idea list for observing) and turning it into a blog is in a pre-bucket list. Still, Astronomy along with husband Neil and son Russell is a family affair. Laura presented a program back in July entitled "The Perseid Meteor Shower, What's it all about anyway?"

Northeast Indiana Chapter Project Management Institute

NEIC PMI NORTHEAST INDIANA CHAPTER

The next NEIC PMI dinner meeting is Wednesday February 24th.

Please see NEIC PMI's website for additional dinner meeting information.

Register now and meet with us at Don Hall's GuestHouse. Networking begins at 5:30 PM, dinner will be served at 6:00 PM, chapter announcements at 6:45 PM and the presentation begins at 7:00 PM. Pay now with credit card. Pay at door option is no longer available.

- NEIC chapter members: dinner and speaker-$20, speaker only-free
- PMI Hardship Provision or PMI Student Membership-$10
- Non-members: Dinner and speaker-$30, Speaker only-$10 Register Now

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Maumee Valley Blacksmiths

The Maumee Valley Blacksmiths, part of the Maumee Valley Antique Steam & Gas Association, meet on the 2nd Saturday of each month in the blacksmith building at showgrounds of Jefferson Township Park, New Haven and also meet on the 4th Saturday of each month at the Solomon Farm.
For more information please contact John Schamber via e-mail at: fwtoolman@hotmail.com.

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):

February 1986

TOP LOCAL SPEAKER FOR ENGINEERS' WEEK BANQUET:

J.O.WINTER.P.E.. OF PROGRAM DYNAMICS WILL BE THE KEYNOTE SPEAKER FOLLOWING THE RECOGNITION OF "ENGINEER OF THE YEAR" AND PRESENTATION OF SCHOLARSHIP AWARDS TO REGIONAL ENGINEERING AND TECHNOLOGY STUDENTS AND THE ENTERTAINMENT FOR THE EVENING.

WINTER IS A MATERIAL HANDLING SPECIALIST. BORN IN BOWLING GREEN. OHIO. A WIDOWER WITH THREE ADULT CHILDREN. AIR FORCE VETERAN. BSME FROM PURDUE.'49. HAS HAD MEMBERSHIP IN 16 NATIONAL AND LOCAL CIVIC AND PROFESSIONAL ORGANIZATIONS. AND A MEMBER OF THE NATIONAL SPEAKERS ASSOCIATION.

LICENSED PILOT. WINNER OF SPEECH CONTESTS. MAGAZINE AUTHOR. NOTED LOCAL SPEAKER AT OVER 40 PAST EVENTS. HE COMES WITH HIGH CREDENTIALS FOR A BRIEF BUT INTERESTING SPEECH WITH A VITAL MESSAGE: "ARE YOU LISTEN' ? ARE YOU LOOKIN' ? --TO REALITY." JIM'S LIVELY AND CAPTIVATING STYLE SPARKLES WITH POINTED HUMOR AND ILLUSTRATIONS IN REVEALING HIS FUNDAMENTAL KEYS TO EFFECTIVE COMMUNICATION BACKED BY 25 YEARS EXPERIENCE SUCCESSFUL DIRECT MARKETING TECHNIQUES.
IF EVERYONE UNDERSTOOD AND PUT JIM'S COMMUNICATION "KEYS" INTO EVERYDAY USE. THERE WOULD BE MUCH LESS UNREST AND MISUNDERSTANDING IN OUR WORLD TODAY.

SEE THE REVERSE SIDE FOR DETAILS AND TIMES OF THE ENGINEERS' WEEK BANQUET
