



Fort Wayne

ENGINEERS' Club

www.FortWayneEngineersClub.org

Engineers News

November 2014 - Vol. LXXVII No. 3

November Tour

PHD Inc. (Fort Wayne Manufacturing)
Thursday, November 20th at 6:30 PM
9030 Clubridge Drive, Fort Wayne, IN 46809

The FWEC November tour is PHD, Inc. (www.phdinc.com). PHD is a leading manufacturer of pneumatic, electric, and hydraulic actuators for assembly, packaging, robotics, and industrial automation. PHD's product line includes cylinders, escapements, grippers, linear slides, rotary actuators, clamps, blow molding equipment and more.

Known for performance, flexibility, and extremely long life, PHD actuators welcome the challenge of many different types of operating environments. Our fast delivery will reduce your inventory costs and keep your production schedule on track. Finding a solution for your specific automation needs has never been easier or faster than it is with PHD.

PHD is a leading manufacturer of industrial automation actuators, designed to help companies across all industries optimize their manufacturing processes. Our products consist of a full line of cylinders, escapements, grippers, linear slides, rotary actuators, clamps, multi-motion actuators, switches and sensors. These actuators provide the fundamental motion to push, pull, lift, rotate, turn, grip, reach, clamp, hold, position, escape, insert, load, unload, pick, place, and orient parts or materials in your manufacturing processes. Known for robustness, precision, and extremely long life, PHD products have the attributes and performance design engineers demand.

Since 1976, Yamaha Robotics has provided assembly robots to the industrial marketplace that are unsurpassed for payload, speed, and dependability. The current robot line-up is the culmination of over 3 decades experience in Yamaha's own plants and thousands of others around the world. From single axis robots to the broadest selection of SCARA robots anywhere, Yamaha can supply the best solution for nearly any automated assembly requirement. Yamaha robots' extraordinary life span gives a return on investment unequalled by any other robot manufacturer.

December Social and Tour

Mad Anthony Brewing Company
Thursday, December 11th: 6:00 PM social, 6:30 PM tour
2002 Broadway, Fort Wayne, IN 46802

The FWEC will once again have their December social at Mad Anthony Brewing Company (www.madbrew.com). The social will begin at 6:00 and a tour of the production brewery (www.madbrew.com/brewery) will begin at 6:30.

The production brewery is located in the parking lot of our restaurant and original brewery. This location produces all bottled beer, draft account beer, and beer for local festivals. The brewery itself is a 15 barrel Bohemian brewery with a copper brew house, two fifteen barrel fermenters and a thirty barrel fermenter. Three fifteen barrel bright tanks give the Mad Anthony beers room for conditioning.

All bottling is currently performed on an older model Meheen style bottler with a capacity of 30-50 cases per hour.

TekVenture Open House for SAE Members and Prospective Members

TekVenture Incorporated Invites the Society of Automotive Engineers (SAE) to a pizza party and tour of TekVenture's new headquarters on Thursday November 13th, 2014 from 5:00 PM to 8:00 PM. TekVenture's new address is: 800 Broadway and Swinney Streets, Fort Wayne, IN (Just South of the old GE Complex).

See: 3D Printers, Get Scanned for 3D printing! See EggBots, Machine Tools, Sweepers! ArtCar Bay! Ride the Car Lift! Hundreds of Tools! & Other Wonders!! Register 4 your Free TekVenture Membership!

Information @ 260.432.1095 or gregj@tekventure.org

RSVP: brajghatta@gmail.com by November 10th, 2014

2014-2015 FWEC Board Candidates and Open Position

The FWEC is still in need of a member to fill the Vice President position. Vice President becomes the President the following membership year.

Below are the 2014-2015 FWEC board candidates. 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.

Board meetings generally last around an hour and are generally held on the first Tuesday of the month during the membership year (September to August).

Current 2014-2015 Membership Year Board Candidates:

President: Marna Renteria Vice President: Open
Treasurer: Ryan Stark Secretary: Elizabeth Garr
1st Year Board Member: Mike Magsam & Jack Phlipot
2nd Year Board Member: John Magsam & Rod Vargo
3rd Year Board Members: Dan Delaney & David Momoh

In Memoriam

The FWEC would like to remember Chris Highlen. Chris was a longtime FWEC member and heavily active in Fort Wayne Astronomical Society and TekVenture.

A celebration of the life of Chris Highlen will be presented in the Achatz Hall of Science, University of Saint Francis, Sunday November 16 at 4 p.m. All are invited to attend this event lead by members of the Planetarium and University staff, members of the Fort Wayne Astronomical Society, and TekVenture. For those wishing to experience Chris. work with the planetarium, there will be 2 screenings of the Planetarium.s .A Canticle Experience. at 3:15 p.m. and 3:30 p.m. prior to the celebration.

Message from the President, Marna Renteria

The 2014-2015 year for the Fort Wayne Engineers' Club promises to be an exciting one, and I am honored to step in as this year's President. In particular, I am excited about our new relationship

with Discover-E (formerly known as E-week) as a sub-committee of FWEC. I also look forward to another year of supporting future engineers with our annual academic award. Your annual donations are vital in supporting this support to students, so please send yours in, if you have not already done so. It will be greatly appreciated . today and beyond!

Welcome new FWEC Members

The FWEC would like to welcome new full member Michael Miller and new associate member Cynthia Miller. 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.

Welcome new FWEC Members

The FWEC would like to welcome new full member Dave Schaller BSEE and new student members Scott Anderson BSEE at Indiana Tech and Will StuckeyWoodlan Jr/Sr High School. 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.

Well Wishes

The FWEC would like to extend well wishes to longtime FWEC member Salvatore Dimilla. His daughter reports his declining health. Please remember Salvatore in your thoughts.



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Schmalz, vacuum products
Tolomatic Automation
WIKA, pressure gauges & instrumentation
www.Sidenereng.com

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.

October Tour History

The October tour history is provided by FWEC Vice President Rod Vargo:

Twenty-six members and spouses turned out for an October 23rd afternoon tour of the Allied Recreation Group's assembly plant in Decatur. Allied is a consolidation of multiple companies begun when the RV industry collapsed during the 2008-2010 Great Recession. They have continued to acquire brands and suppliers.

The industry now has insufficient manufacturing capacity. This seemed evident during the tour and Allied Recreation Group was most gracious in having us underfoot. Interestingly, 80% of national RV manufacturing capacity consolidated into Indiana.

This facility builds gas and diesel powered motor homes with numerous models and custom variations sold under five brands (please see the internet!) ranging from short vans with basically a box on the back, to various lengths of ten-wheeled bus-like vehicles. Weight is the primary limiting factor in designing motor homes. Retail prices range from \$40,000 to \$850,000 but often serve business people as their sole home. The top prices include as much as a week for owner training and to assure the vehicle is properly tweaked for them.

Allied Recreation Group has three locations in Decatur. This assembly facility employs 1500-1700 people (most in one daytime shift) and includes operations consolidated from California and Pennsylvania. They employ six full-time degreed engineers, somewhat unusual for an industry often relying on engineering from suppliers and subcontractors. Our tour guide was a mechanical engineer turned electrical for wiring harnesses and now LED lighting.

Other than extensive dealer networks, Allied's customer service, parts, and phone bank are consolidated in another Decatur facility. A third facility in Decatur builds cabinetry. A husband and wife in our tour were extremely complimentary of the ongoing customer service since the 2008 consolidation, for their much older diesel pusher. The husband stated his pusher gets 10-11 mpg highway while pulling an antique car, about the same as his gas pickup pulling the same car.

In Decatur, the RV units are built upon three types of underlying base vehicles. One is a van or pickup style front cab with a bare frame behind them, referred to as "Class C." Another is a bare truck chassis with just a steering wheel sticking up and a box of parts for a driver's seat, usually referred to as "Class A." Most of these two types are ordered with gasoline engines.

The third type of underlying vehicle is the "diesel pusher," which will eventually look like a full-size bus converted into an RV. These arrive as two sections, basically a bare-bones front frame incorporating the steering axle on its two tires, and a rear frame supporting the powertrain with one or two axles on 4-8 tires. These front and rear sections arrive bolted together by a temporary mid-section frame. That mid-section is replaced in Decatur with custom-made frames of various lengths containing a large amidships fuel tank, clean and dirty water holding tanks, batteries, electronics, "basement" storage space(s), and other potential features. An air conditioning condenser tends to be placed ahead of the front axle. The rear engine's radiator has optional locations, side-mounted being preferred.



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Figure: This is an example of the substructure in a diesel pusher. (Copied from a Liberty Chassis/American Coach brochure available online and during the tour.)

High-end diesel pushers can be equipped so the engine coolant heats the RV's hot water tank and a diesel-fueled burner can take over when needed. Utilizing that waste heat is very fuel efficient and eliminates the need to maintain propane supplies. On-demand water heating requires too much energy in short spans of time, can get too hot for tight spaces, and the equipment is excessively costly. All pushers have a general purpose generator, so refrigeration and cooking tends to be electric. Halogen lighting is rapidly giving way to LEDs, which use 86% less power and seem to have an adequate service life despite the vibrations of road use.

All large RVs come with four or more jacks on the frame to level the living space, eliminate bouncing when parked, preserve tires if the RV is in storage, and help change tires. Some tire contact with the ground prevents rollovers since the jacks are far inboard.

While the underlying vehicle is prepared, flat-tube aluminum frameworks are typically welded on jigs as separate floor, sidewall, and roof units. The vehicle is then moved under its own power from station to station through the assembly building, which is wide enough for six assembly lines. The rough floor framework is attached to the underlying basic vehicle. A subfloor, various cabinetry, and other features are then put in place, including the entire front dashboard.

The two full-length sidewall units are each handled as assemblies separate from the vehicle. First, they are wired. Typically, a fiberglass outside skin is cut out and otherwise prepared from flat rolled stock, then glued onto the aluminum frame. Various interior skins are prepared and attached to the aluminum framework. Various foam units may be installed but eventually careful amounts of liquid foam are inserted. These side units are attached to the vehicle, followed by a roof assembly which was prepared similarly to the sides.

Large fiberglass front and rear panels are preformed by a contractor and shipped to Decatur. Attaching these front and rear "caps" convert the underlying vehicle and overlying aluminum assemblies into a rigid box.

Sections of living space, intended to slide out of a vehicle when parked, are assembled separately as rigid boxes and installed. The interior is then finished in a bewildering number of

variations.

The exterior paint processes are performed as sequential assembly lines in another separate huge building that includes "baking" rooms. The exterior finishes consume 5-14 days depending on complexity and quality, involving two shifts of workers per day. As many as three primer coats and four clear coats may be applied. Fancy paint schemes, such as multi-colored swirls, are based on dyecut stencils. Each color is a separate paint process applied between the primer and clear coat processes. These schemes have become complex and often require an inordinate amount of skilled hand labor and masking materials across as much as ten days. The most common defect is a speck of dirt caught under a layer of paint.

Start to finish, an RV will require 20-30 working days, much of the difference being paint rather than size. Almost all vehicles have been ordered for a specific dealer or final user. The range of brands, models, and options precludes having an inventory of finished vehicles on hand, with a few exceptions. Vehicles used at shows are typically en-route to a dealer.

A culture and attitude of safety was evident throughout the facility. Our Club's turn out for this tour was much higher than expected but the floor workers took everything in stride despite many monitors showing the pace of their assembly lines. There was minimal safety signage but unusually widespread and effective use of high visibility tape such as outlining floor spaces, movable stair-work platforms, and some swinging door panels. Use of space was conservative to minimize wasted motion but consistently appropriate. Organization of a multitude of jigs, other storage, and welders was well thought out and made good use of space. We were provided individual audio receivers to clearly hear the tour guide as needed. The facility was reportedly started in the 1980's but appeared modern, clean, and orderly throughout. Ventilation was excellent even in the extensive paint building. Safety and environmental staff include a full-time nurse. Questioning indicated the employees choose to be nonunion.

The industry has extensively reduced waste and expense. The temporary frames between sections of arriving diesel pushers are returned for reuse. Some packaging is also returned, such as for fiberglass front and rear caps. Viable recycling programs were evident, including large compactors. Dumpsters were relatively few and the contents sensible.

The afternoon timing was chosen so we could see workers in action and accommodate the drive from/to Fort Wayne. Some of our members did not attend due to conflicts with work. But, this topic was widely attractive and Decatur an inviting short road trip for a fall afternoon. Turnout was much higher than expected, but that showcased the good mood and organization within the plant.

This was a very worthwhile tour with substantial personal and professional interest among the participants and many spouses. The facility was a gracious host and well equipped for tours, including those individual audio receivers to hear the tour guide regardless of our various movements.

YOU ARE INVITED TO ATTEND

BUSINESS AFTER HOURS

ADAMS RADIO GROUP'S OPEN HOUSE

TUESDAY, NOVEMBER 18, 2014

OPEN HOUSE from 5 - 7 p.m.

ADAMS RADIO GROUP

2000 LOWER HUNTINGTON RD., FORT WAYNE
46819

FREE EVENT

COME SEE ADAMS
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NEWLY REMODELED
AND REDESIGNED
FACILITY

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&
HOR D'OEUVRES
WILL BE PROVIDED BY
CS3 (CALHOUN STREET
SOUPS, SALADS, &
SPIRITS)

ADAMS
RADIO GROUP



Northeast Indiana Discover-E Committee

Northeast Indiana Discover-E Committee (formerly Northeast Indiana Engineers' Week) is now a standing committee within the FWEC. The committee's mission is to sustain and grow a dynamic engineering profession through outreach, education, celebration, and volunteerism. The Discover-E Committee shall support the Northeast Indiana region by connecting area engineering companies with engineers and students to encourage retention of local talent within the profession.

The incorporation of the Northeast Indiana Discover-E Committee as a standing committee within the FWEC was a result of a 2013-2014 board member vote and corresponding update to the FWEC bylaws (<http://fortwayneengineersclub.org/constitution.pdf>).

The Northeast Indiana Discover Committee will be working to upgrade their website with more information to follow.

FWEC Board Meetings

Fort Wayne Engineers' Club board meetings are open to all FWEC members. The next FWEC board meeting will be Tuesday December 2nd at 7:00 PM. Board meetings are held on the Indiana Tech campus in the Zollner Engineering Center in room Z-203 (www.indianatech.edu/SiteCollectionDocuments/Campus_Life/Campus_Map.pdf).

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 November 19th, 1943](#) (and was specially selected by our Treasurer Ryan Stark:

This is Mr. C.E. Carlson. Mr. Carlson is Treasurer of FWEC.

He is unhappy.

FWEC members are not paying their dues.

The Engineers News has not been giving Mr. Carlson and his problems enough publicity.

He can't be blamed for being unhappy.

As long as Mr. Carlson is unhappy his picture will appear in the News.

Mr. Carlson will accept payment of dues at the Chamber of Commerce on November 19. The dues are \$3.00 for regular and associate members and \$1.00 for non-resident members.

Fort Wayne Engineers' Club
www.FortWayneEngineersClub.org

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