Fort Wayne ENGINEERS' Club

Engineers' News **September 2022** **Vol. 85 No. 1**

www.FortWayneEngineersClub.org

May Tour Summary

FWEC tour of PHD, Inc.
May 26, 2022
Summary by Rod Vargo

PHD, for pneumatic hydraulic development, began as a Fort Wayne shop in 1957 manufacturing a small pneumatic piston actuator called "Tom Thumb". It was marketed as essentially the only unit available which could be easily disassembled for rebuilding. Rebuilding meant replacing parts such as o-rings. This provided substantial savings compared to complete replacement of highly machined metal bodies, as well as logistics and delays. The business expanded by providing

various sizes of the air-driven actuator and introducing units that used the newer technology of hydraulic oil. The expanding technology nowadays is electro-mechanical devices, often teamed with the older types.

Read full summary here

September Tour

When: **Saturday, September 24 @ 1:00 PM**
Please note the non-standard Saturday meeting day.

Where: Fort Wayne Flying Circuits Flying Field
1702 S. Webster Road, New Haven, IN 46774

Website: https://www.flyingcircuits.org/event/helicopter-event/

Info: The public is invited and welcome anytime after 9:00am. Lunch is open to the public and served between 11am-12pm (normally $5-$8). **The Engineers' Club meeting starts at 1:00pm.** Our plan is to have a Flying Circuits member talk about the old days of RC helicopters and where the technology is at now. It is truly remarkable what they can do! Prior and after, watch the helicopters...

No signup required.

October Tour #1

Indiana's First Skyscraper - The Lincoln Tower

When: **Friday, October 14 @ 4:00 PM**

Where: The Lincoln Tower
116 E Berry St, Fort Wayne, IN 46802

Website: *https://archfw.org/heritagetrail/centraldowntown/the-lincoln-tower/*

Info: Join us for a behind the scenes tour of one of Fort Wayne's best known landmarks and Indiana's first skyscraper. Starting in the beautiful lobby, this tour will work its way up, include climbing 4 flights of stairs from the 19th floor to the Observation Deck. This jaunt will be worth it for the view, including the city's fall foliage.

No signup required.

October Tour #2

MetalTechnologies™
More than metal.

When: **Thursday, October 27 @ 7:00 PM**

Where: Metal Technologies
1537 Auburn Dr, Auburn, IN 46706

Website: http://www.metal-technologies.com/

Info: Metal Technologies is a premier metal casting company that uses modern technology and a highly productive workforce to produce the best quality product. In

business since 1997, they produce high quality gray iron, ductile iron, austempered ductile, and value-added machining for a variety of industries.

No signup required.

Items of Note

FWEC member Rod Vargo is Chair of the 27 year-old and all-volunteer Utility Advisory Group, which formally advises Fort Wayne City Utilities and often City Council. Your comments are welcome at rodvargo@comcast.net

---

Volunteer Positions within the Club

Membership and Contact Chair: Open
Northeast Indiana DiscoverE Chair: Open

Let us know if you're interested!

Volunteer

General Club Info

Fort Wayne Engineers Club dues are $0. Donations are welcome but strictly voluntary. In recent years, club funds have helped support Discover-E, the Regional Science and Engineering Fair, annual bridge building contests in schools, academic awards, networking events, mentoring, our website, and facilitating free tours.

Please see FortWayneEngineersClub.org, LinkedIn, or Facebook for updates on current Club activities, other news, and past newsletters.

Those participating in activities or hosting tours through FWEC do so strictly at their own risk, including disease exposures. Participation in club events is voluntary, free, nonprofit, and solely for the benefit of participants and the community at large. Anyone with an interest may participate unless restrictions are specified for specific

events, such as minimum age or minimum safety attire.

Interested in hosting a tour?

Contact us today!

Host a Tour

FWEC Roster for FY2022-2023

President: Nate Berndt
Vice President: Nathaniel Wisel
Secretary: Marna Renteria
Treasurer: John Magsam
First-year Board Members: Ryan Stark, Ed Woodward
Second-year Board Member: Mike Magsam, Rod Vargo
Third-year Board Member: Dave Gordon, Bert Spellman
Editor of Engineer News: Melissa Kurten
Membership and Contact Chair: Open
Northeast Indiana DiscoverE Chair: Open

Job posting and resumes listed

The club accepts both job openings from around the area, as well as resumes from those seeking employment. Please submit these to the following email address: Info@FortWayneEngineersClub.org

Advertise in the Engineers' News

The FWEC provides advertising space within the Engineers' News.
Advertisements are only $10 per issue and limited to ½ page of content.

Advertise Your Business

May Summary Continued

A parallel business evolved developing specialized variations for customers, but only if a suitable item is not already available from other sources. PHD holds 32 active U.S. patents, which compound out to over 100 patent interests in various companies worldwide. Protecting and overseeing patents adds up to "quite an expense".

Over time, PHD ended up developing "virtually anything that moves on the end of a robot", including the classic hand and fingers which grasp and position almost anything imaginable in global commercial activity. PHD also conceived robotic work tables and other platforms which can reposition themselves by sliding on rails. The product catalog at phdinc.com currently offers 750 million potential combinations of products and characteristics. Many can be delivered to a customer within 24 hours and most within days, using a combination of parts on hand in inventory and various overlapping forms of rapid manufacturing. Lost time on a robotic production line can represent losses of a million dollars per hour. Responsive and capable customer service is required.

Over time, they've been forced to systematically expand business and supporting locations almost worldwide. "Home" is three major modern buildings on a large campus near the Fort Wayne airport and another near Huntington, each for multiple specific roles. PHD is also in a strategic partnership with YRG, which is Yamaha's robots, including robotic arms.

PHD claims to employ 32 engineers, but that seriously understates obvious outlays in extremely technical people and specialized equipment across both buildings that we toured. Quality control and oversight is constant throughout, including incoming fasteners and outgoing packaging. Packaging was characterized as among the most challenging in terms of sheer variation of materials such as boxes and padding for PHD's millions of potentially awkward and/or heavy products.

Officially, half those engineers are employed designing, developing, and testing specialized customer solutions. One of the buildings on campus is dedicated to it. Multiple design and testing softwares are used. A tenet of PHD business philosophy is to engineer for durability, allowing a somewhat higher price that readily justifies

itself in decreased lost time on customers' production lines.

The robotics industry is in transition. In general, pneumatic (air) activated equipment is obsolete. Reasons include slow or delayed responses which are inherent with air (which leaks, compresses, and decompresses over the length of air lines) and higher energy consumption maintaining air pressure. Hydraulic units are mainstream but rapidly becoming outdated. Far more precise speed and movement is obtained with electro-mechanics, the combination of electric motors and controls (such as programmable computer chips) with mechanical devices such as servos and/or modern chains.

The picture shows a mesmerizing demonstration unit for trade shows which utilized PHD's modern "hand" with fingers (partially pneumatic) and electromechanical arm to assemble and disassemble a drink container at lightning speed. It can vary almost instantly between a very wide range of speeds, but does NOT need safety shielding because it stops instantly and gently enough when someone bumps into it. (Ed.: Even incidental contact with heavy or powerful moving entities can shatter bones almost regardless of speed.)

A similar demonstrator, which did need safety shielding, used a gantry system on a worktable, analogous to the gantry cranes which load and unload container ships. Like those cranes, components on it moved along rails in combinations of ultra-precise x, y, and z coordinates using chains driven by electric motors. It is extremely easy to program precise x, y, z movements and speed changes across the unit's workspace. The unit can be manufactured in almost any size, although currently offered only up to 49 feet in any dimension. Currently, it can manipulate items up to 140 pounds.

PHD underscored that extremely well honed and broad management is required for survival in modern business, particularly on a global scale. The internal and external demands are unrelenting, engineering curiosity essential. Our sincere thank you to the many who were on hand for our visit.


mailchimp