

Engineers' News

June 2019

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



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## **June Social Changed to Friday, June 28, 5:00 to 7:00 PM**

### **June Social**

1550 Griffin Street, Fort Wayne, IN 46803

Come and go as you please to a joint gathering with TekVenture. Fort Wayne Engineers Club will provide pizza and refreshments at TekVenture's huge workshop facilities (note the plural) inside 1550 Griffin Street in Fort Wayne. (The volleyball courts are NOT part of TekVenture.) FWEC will provide bottled water and soda pop. Feel free to bring your own drink(s) if that is not sufficient. If needed, contact FWEC President John Magsam at [jomag701@gmail.com](mailto:jomag701@gmail.com) or (260) 579-3431. There is more information about the TekVenture location, below in this newsletter.

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## **Important Technicality About Engineering and STEM in High School & College**

The focus of many academic fields of study has changed and students are graduating (after great expense) into careers they do not want. Electrical Engineering, for instance, is now typically about very low voltage semiconductors, software, and/or electromagnetic fields/waves. A graduate in EE will be unprepared for conventional or green power unless these are studied as a minor or secondary program. In general, "power systems" and other classical EE are now called Industrial Electrical Engineering (IEE). The Industrial series of engineering fields have long been in particularly short supply and sustained demand. Within various specialties, Project Engineers are an often overlooked

subspecialty that has enjoyed sustained demand and higher compensation. There are also potentially lucrative Trades such as Journeyman or Master in fields such as Electrician, Machinist, Welder, and more. Study of these Trades typically includes paid work and the option of a college degree. They have been in sustained demand virtually worldwide. In all cases, a 3.0 GPA or higher always matters and reflects comprehension of underlying detail and meaning. Repeat classes if needed to attain the GPA.

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## **Free Plane Ride for Kids**

**FREE AIRPLANE RIDES BY EAA-2 FOR KIDS: DeKalb County Airport, DeKalb County Airport, Smith Field Airport, and Kendallville Municipal Airport.** [https://www.eaa2.org/young\\_eagles.php](https://www.eaa2.org/young_eagles.php)

Our local Experimental Aircraft Association Chapter 2 (EAA-2) has scheduled more Young Eagles flight events. These are FREE AIRPLANE RIDES for kids, 8-17 years old, which they have conducted annually for decades. The remaining dates for 2019 are: at DeKalb Airport, June 15, August 24, & September 14; at Smith Field, June 8 & August 10; and at Kendallville Muni, June 22 and September 21. It is best to arrive a bit early to avoid waiting in line, and because the atmosphere can get more turbulent as the day warms up.

EAA-2 has CANCELLED its pancake fund raiser of June 29. It will be rescheduled.

EAA-2 is also a primary volunteer group supporting the world-renowned AirVenture near Oshkosh, WI, each year. They would be an outstanding local contact for anyone wishing to be involved at that event. This year's AirVenture is July 22-28, 2019

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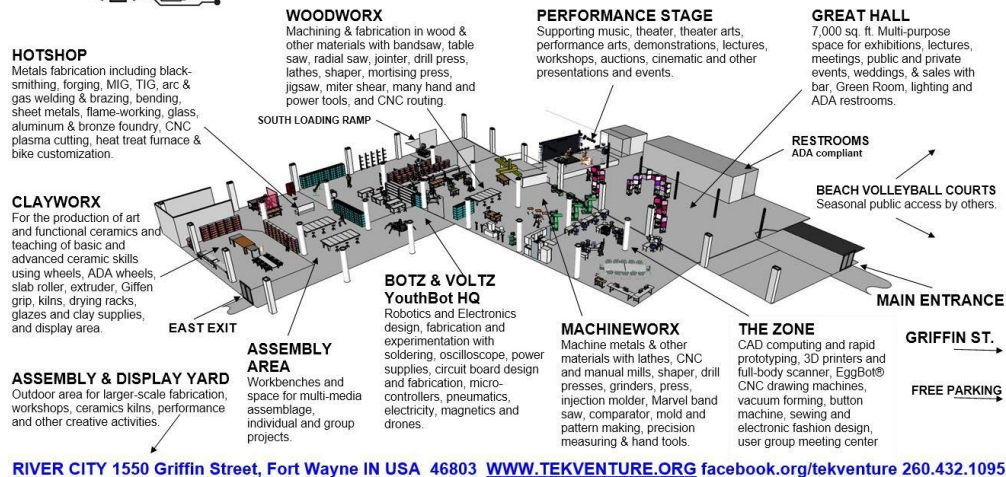
## **TekVenture Meetings Open to The Public**

Got something you want to make, a technique you want to learn or a tool you want to use? Come to TekVenture and start Making your future! See [tekventure.org](http://tekventure.org). This location has also substantially lowered their overheads and costs of membership.



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## May Tour Summary

### Tour of American LandMaster Utility Task Vehicles (UTVs) Showroom and Manufacturing facilities at 2499 S. 600E, Columbia City May 21, 2019

Seven FWEC members turned out for this tour on a rainy Tuesday afternoon. American LandMaster is among many diverse businesses locally owned by or associated with Ambassador Enterprises, LLC, an investment company based in Fort Wayne and widely diversified here. American LandMaster grew gradually from a local, still active, go-cart business through product developments and purchases of other businesses.

Their UTV segment originated with light-duty off-road vehicles designed and built in Louisiana for that State's intensely demanding off-road and economically conservative conditions. Devastation from Hurricane Katrina resulted in Ambassador Enterprises purchasing that UTV business and eventually relocating all operations here during 2017 into a single large (75,000 square feet?) and flexible building.

Certain manufacturing capacities were deliberately oversized when the entire facility was designed in 2017. They powder-coat parts up to 4' x 6' x 10' for other businesses, in an obviously good working environment which appears compliant with regulations.

American LandMaster UTVs intentionally target simplicity for ease of use and maintainability, which also provides initial affordability. A large number of easily changeable add-ons includes utility beds, tire types (manufacturing floor, residential, ranch, off-road), electric winch, snow plow, and racks. The picture (below) illustrates their

patented pickup-style steel tilt bed, with tailgate, which readily unfolds into an upholstered bench seat. Mounted on a quad-cab UTV, there can be seating for six.



Their second most popular bed is a flat diamond-pattern steel platform which provides an unrestricted working surface and/or stake bed, with a forward bulkhead to protect the front seat from shifting loads. All their UTVs have a frame-mounted 2" x 2" towing receiver rated for 1200 pound gross weight.

The underlying vehicle is fully suspended and available as rear wheel drive or four-wheel drive. All have locking rear differentials and four-wheel disc brakes. Power can be 48 volts electric motor with regenerative braking or gasoline-fueled Briggs & Stratton or Kohler motors, all readily replaceable if needed. Rear differentials are brand-name, manufactured in Ohio.





The manufacturing floor was a vast affair arranged in contemporary fashion with incoming materials arriving at one end and proceeding to shipping of finished products at the other (actually a loop so the same loading docks can be utilized as needed). Much of the tour discussed continuous improvements in workforce quality and satisfaction, product quality, defect elimination, labor efficiency and ease, and product evolution. One of the important aspects of our tours has been the essential ingredient across successful businesses of continuous improvements in these factors and more, measured in easy-to-understand numbers.

The process begins with laser-cut steel tubing which is bent in long (10'?) CNC controlled bending machines and then briefly confirmed by hand comparison to a work-table jig. A few further details improve overall fit and alignment prior to assembly on jigs in an extensive area for hand welding. Alignments were repeatedly mentioned throughout the tour as highly significant in performance including durability and braking.

Powder coating of these metal assemblies is a water-based process involving thorough cleaning, an anti-corrosion layer, thorough drying, finish coat(s), and at least one baking in a large oven. The powder coating facilities were clean, new, and extensive, to say the least. Powder coating was chosen as more environmentally and worker friendly than appropriate paint systems. All of these systems vary in corrosion-protection and appearance depending on labor and materials, which are "reflected" in product price.

Plastic parts such as fenders and front cowl are obtained from specialty vendors in our region.

Various finished components are placed into LandMaster vehicles on three adjoining assembly lines. Scheduling the sequence of their various types of vehicles is an important and ever-improving parameter in cost control. Use and ease of labor seemed well refined but another round of employee suggestions was about to be tried out.

The UTV body is primarily a passenger safety cage with attachment points for specifics such as power train, rear bed, front cowl, optional load racks, winch, snowplow and more.

The front axle has four flex joints (did not discuss what kind) suspended with control arms and shock-in-coil spring assemblies. The engine, drive train, and tow receiver is effectively a platform which pivots on a forward gimbal and which is controlled on the sides/rear by at least four shock-in-coil units. The vehicles appear effectively mid-engined.

The market used to prefer shipping the vehicles partially assembled in crates, to save on shipping costs. A shortage of labor in seasonal businesses is shifting the mix towards shipping fully assembled vehicles. Factory assembled vehicles receive far fewer customer complaints. But, customer interactions help drive relentless improvement processes often discussed by our hosts (and which have proven essential to business survival in most of our private sector tours).

Many suppliers are trying to raise prices "due to tariffs". LandMaster has a very interesting response in requesting tariff increases as a line item, arguing tariffs are constantly changing and potentially temporary. We could see multiple lucrative and astute ways of utilizing this line of discussion.

There were some questions about how fast these UTV's could go. As encountered in our other tours, vehicle products exceeding their envelopes of the regulation (roughly 26 mph in the case of UTVs) must undergo additional, extensive, and expensive prototype testing (such as crash or crush standards) including even seats and fuel tank considerations.

Staying within utterly necessary safety and other envelopes makes it much easier and affordable to experiment with modifications and ongoing quality improvement. While any vehicle might be altered by its owner, even straight-forward choices such as tire types are optimal for specific uses and generally frustrating or worse if used in other roles.

By chance, I stopped at my local auto repair shop en route to this tour. The auto shop happened to be rebuilding the transmission of a 1946 Willy's "quarter ton" U.S. Army "Jeep" in mint condition, complete with hand-powered windshield wipers, canvas roof, no doors, no heater, narrow kidney-beater tires, and inflexible one-piece front and rear axle housings suspended on implausibly-thin straps of leaf spring. There were no safety protections whatsoever. The driver essentially sat on a generous gas tank protruding through the floor. Maximum speed in low range was placarded at 31 mph. A mass of thick Manila-like towrope was wrapped in figure eight around the front bumper. A very small

towing pintle was bolted to the rear frame.

These are very closely comparable utility task vehicles, 76 years apart, except the changes in technology and space utilization are remarkable. The Jeep is more than twice as heavy (despite no safety cage) yet placarded for lower payload and towing. Adjusted for inflation, original pricing appears equivalent.

Sincere thanks to our hosts: American LandMaster, Mike Barnhill, Paul Perrin, and Victor Riedman.

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## **FWEC roster for FY2018-2019**

FWEC roster for FY 2018-2019:

President: John Magsam

Vice President: Open and under discussion; comments and suggestions welcome.

Treasurer: Ryan Stark (456-0809).

Treasurer Trainee: Volunteer needed.

Secretary: Marna Renteria.

First-year Board Members: Rob Cisz. Another volunteer needed.

Second-year Board Member: Dave Gordon, Morgan Miller. Another volunteer needed.

Third-year Board Member: Rod Vargo (416-0986). Craig Welch.

Editor of Engineer News: Maruf Ahmad.

Membership and Contact Chair: Dave Schaller.

Northeast Indiana DiscoverE Chair: Rob Cisz.

PLEASE CONSIDER STEPPING UP INTO ONE OF THE OPEN POSITIONS. Most require very little time. The economy is booming, so tasks are being distributed across more people. Outgoing individuals are experiencing increased demands outside FWEC. Historically, Board Member ages range from high school through retirement. Participation tends to return more than it takes.

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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 on August 27 at 7:00 PM. Board meetings are held on the [Indiana Tech campus in the Academic Center](#) in room ACC-201.

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## **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](mailto:info@fortwayneengineersclub.org).

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