EAA CHAPTER 80 NEBRASKA IOWA

News!

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November 2014 Newsletter

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Introduction To Unmanned Aircraft Systems

Wayne Woldt, an associate Professor in UNL Department of Biological Systems Engineering and School of Natural Resources, and Jacob “Buddy” Smith, presented the members with an overview of the advances in unmanned aircraft systems combined with next generation sensors will contribute to the challenge of feeding our future world in sustainable manner. Dr. Woldt has developed the NU-AIRE laboratory and flight program with a focus on research and education in unmanned aircraft systems. He is a certified pilot in multiple aircraft to include SEL, glider, and hot air balloons. Buddy Smith works with Dr. Woldt. He has 31 years experience flying tactical and strategic reconnaissance aircraft with the USAF and was a technical expert on satellite-based remote sensing. He is a commercial pilot, CFI, and Unmanned Aircraft Systems expert.

Dr. Woldt is showing farmers and crop scouts that using unmanned aircraft outfitted with advanced imaging sensors is beneficial in locating problem areas, such as weeds, water stress,

insect stress, and crop stress. The UAS initial studies focused on evaluating flight plan tracking performance using the SwiftPilot navigation system integrated into the Tempest fixed -wing aircraft. Flight path performance is an important variable in terms of placing sensors in an efficient manner to support the extreme data demands of precision agriculture. The SwiftPilot is a state of the art flight computer (i.e., embedded processor) serving as a lightweight customizable, and low-cost autopilot. The package and utilizes a 6-axis inertial measuring unit, global positioning system, a dynamic pressure sensor for airspeed, and a static pressure sensor for determining altitude. The SwiftPilot allows access to every control loop using a cascaded proportional-integrated-differential {PID} controller through the SwiftPilot SDK unit, allowing high level algorithms for performing robust trajectory planning and flight path following.

The Tempest unmanned aircraft is light-weight but strong, made primarily of fiberglass with carbon-fiber composite for reinforcement in the wing spar and the lower surface of the wing. The detachable wings have a span of 3.2 meters with a maximum gross takeoff weight of 6.8 kg. A smooth undersurface-and a folding propeller enables landing in grassy fields and with road surfaces with no landing gear. The Tempest utilizes an in-runner electric motor with a gearbox manufactured by Neu Motors, a Castle Creations ICE speed control, a Graupner propeller, and a 10,000 mAh lithium polymer battery manufactured by MaxAmps, providing flight time of approximately 45 to 75 minutes depending on the cruise speed setting. Realization of these, as well as many other applications, will require continued creative research and development in the process of data fusion of information and sensor systems, as well as the integration of technology capable of placing the sensors at the desired location and time into the UAS. Perhaps the effectiveness of an aerial sensor program will depend on its ability to both 1) cover a large expanse of land, and 2) levitate over desired areas of the agricultural operation. In addition, to achieve the long range potential of precision agriculture, the UAS will need to carry an appropriate sensor and data storage package, remain on a given target area, and work in tandem with on-the ground robots via wireless communications such as mesh net radio systems. Currently, fixed wing UASs have the longest range, with a flight time of hours. Multi -rotor copters which can have flight times as low as only 20 minutes, have the advantage in hovering over a target area, but maybe more susceptible to environmental conditions that restrict flight. In order to meet the evolving global demands for food and fiber into year

2050, research and development on UASs will need to advance. Of course, it will also require the engagement of our best and brightest human resources.

Next Chapter Meeting

Next meeting will be November 10, 7 pm, at Millard Airport. Hope to see you there.

Chapter Meeting Minutes
October 11, 2014

Meeting opened at 1900 by President Tom Mann.

Minutes: Due to some administrative problems, a motion was made and passed to discard the minutes for the meeting held on September 8, 2014.

Treasurer Report: No Report.

Membership Report: Nothing new.

Tool Report: All accounted for.

Young Eagles: The final 2014 Young Eagles rally was held on October 18 at Millard. The chapter flew 76 kids. My thanks goes out to the eight pilots who flew and the many members who turned out to support the ground crew functions. It was a day to remember.

Tech Counselor / Fly-Out: Six aircraft flew to Wichita, KS for lunch. Good flight and good food.

Flight Advisor: No Report.

Social Coordinator: TW reminded members of the December 12 date for our XMAS party. It will be held at Arbor Hall (same place as last year) and will cost $27.00 per person. Plan to attend.

Builders Reports:

-Chris Halfman has put about 57 hours on his RV-7A.

-Tim Hewitt working on fuselage of RV-8A.

Ted Drefs working a Zenith 750 Cruiser.

Old Business: Kevin Marking took the propane tank at Wahoo which was the last item we had at the Wahoo hanger.

New Business: TW has access to an engine that needs a new home. Contact him for further information.

The president asked for nominations for officers to serve next year, 2015:

Two nominations:

-Jerry Roth for President

-Chris Halfman for Vice President

Already Accepted:

-Young Eagle Coordinators Lester Tinnin & Dale McClure

-Newsletter Editor / Lester Tinnin

Open Offices:

-President

-Vice President

-Membership

-Social Coordinator

Unconfirmed Offices Status:

-Treasurer

-Secretary

-Tech Counselor

-Website Manager

Raffle won by Lester Tinnin and donated back to the chapter.

Program: Unmanned Aircraft Systems (UAS). Further info on this program can be found at http://www.nuaire.unl.edu

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Website: www.eaa80.org

For the Secretary, Lester Tinnin

Experimental Aircraft Association
- Chapter 80 C/O Hangar One
12916 Millard Airport Plz.
Omaha, NE 68137-4280

SportAir Workshops

Nov 8-9, Indianapolis, IN

Composite Construction	$349/$389
Fabric Covering	$349/$389
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Electrical Systems & Avionics	$349/$389
Gas Welding	$349$389

Nov 22-23, Pittsburgh, PA

Composite Construction	$349/$389
Fabric Covering	$349/$389
Sheet Metal Basics	$349/$389
Electrical Systems & Avionics	$349/$389
Gas Welding	$349/$389

For Workshop Info go to: http://www.sportair.com and select the workshop you want. E-Z pay is available. Call 800-967-5746 if interested in this option.

PIREPS
Nebraska Department of Aeronautics

York Airport (JYR) EAA Chapter 1055 Fly-in breakfast (free will donation) on 1st Saturday of every month 8:00 am to 10:00 am.

Crete Airport (CEK), EAA Chapter 569 Fly-in breakfast on the 3rd Saturday of every month 8:00 am to 10:00 am.

October 8—Bellevue, Safety Seminar provided by AOPA from 7:00 pm to 9:00pm at Bellevue West High School., Cafeteria, 1501 Thurston Ave, Bellevue, NE.

October 18 Sidney (SNY) Fly-In breakfast 7am—Noon. Free airplane rides ages 8-18 by EAA. Adults $8, Children under 12 $4. PIC eats free. More Info: 308-254-7448.