



Engineering News

Department of Engineering Newsletter • Volume 10, Number 2A

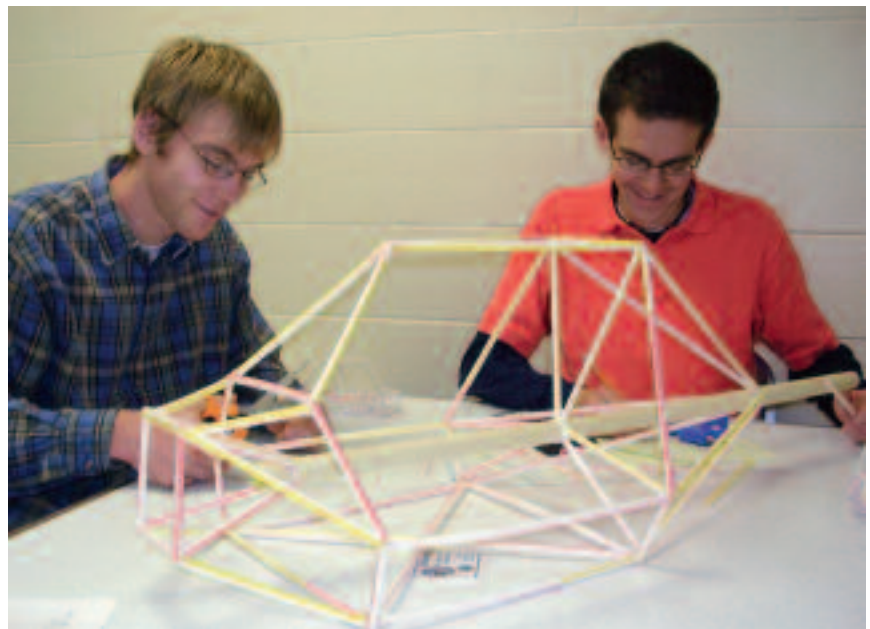
Spring 2006

Flying club designing new missions aircraft

The Messiah College Flying Club is designing a new type of aircraft suitable for use on the mission field. Having already built two working ultralight airplanes in prior projects, the club decided to initiate the new design project after the Federal Aviation Administration announced a new classification of airplane, the Light Sport Aircraft (LSA). Meant to bridge the wide gap between ultralight aircraft and General Aviation (GA) type planes, LSAs can weigh more, go faster, and carry more people than ultralights, but have relaxed licensing and piloting regulations compared to GA planes. The new LSA classification has created the opportunity to design a plane that would be much more practical and useful than an ultralight on the mission field, at a fraction of the cost of a traditional GA aircraft.

Before starting the design, the flying club sought out the advice of several missions agencies and made a list of characteristics that the "ideal" missions plane would have, such as the ability to take off and land from short, unimproved runways, rugged construction, folding wings, and the ability to carry two people with one seat that could be converted into a stretcher. The new plane is expected to meet most, if not all, of these criteria.

The project got a major boost in spring 2005 when it was selected to receive an exploration grant from the Collaboratory for Strategic Partnerships and Applied Research, which has provided funding for many of the major components required for the prototype. While



Jonathan Shenk '08 (left) and Lucas Witmer '08 work on a soda-straw model of the frame for the airplane that the flying club is building.

the flying club is spearheading the design, the project has attracted the attention of students outside of the flying club. Four engineering students are doing their senior engineering design projects designing the engine installation and speed reduction unit for the prop drive. To power the plane, they have chosen a single-rotor Wankel engine weighing about 100 pounds and producing 75 horsepower. In addition, a senior math student is doing her honors project using finite element analysis (FEA) to optimize the design of the fuselage, which will be

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constructed of aircraft steel tubing. Recently, the junior engineering majors in materials science class began working on a semester project studying different methods for connecting the wing ribs to the tubular aluminum spars. Currently, construction of the reduction drive system is well underway and the

construction of the fuselage slated to begin later in the spring semester after the FEA analysis is complete. The new plane is expected to be ready for initial test flights by fall 2007.

The project is being enthusiastically guided by flying club faculty advisor Don Pratt, who has been building

and flying airplanes for more than 25 years. Both he and the students are very excited about the possibility of their new airplane being used to support missions and provide emergency medical transport in developing countries.

ACTS tests missions communication and trading system

by Harold Underwood

As of fall 2004, a new student group has formed at Messiah specializing in Antennas, Communications, and Telemetry Services (ACTS). ACTS has invested some funds granted by the Collaboratory for Strategic Partnerships and Applied Research on radio and GPS equipment capable of demonstrating the Automatic Position Recording System (APRS) used to track the location of a voluntary subject. The mobile end has a GPS unit connected to the transmitting radio and the tracking end uses a receiving radio feeding data to a PC with mapping software for display. APRS may

be used to track travelers, aircraft, and other vehicles in remote locations using GPS rather than radar.

APRS is of particular interest in missionary aviation for pilots flying in otherwise hard-to-reach areas. A version of APRS known as the Automatic Flight Following System (AFFS) by Flightrack International has been in use by Jungle Aviation and Radio Service (JAARS) aircraft for some time, and this year a simplified low-cost version of APRS compatible with the Codan NGT radios preferred by Missions Aviation Fellowship (MAF) has been the subject of a

senior engineering design project. Recently, ACTS has been asked by Missions Safety International (MSI) to test the compatibility of AFFS with the Codan NGT radio, a service project that the group has agreed to pursue.

Any students interested in getting involved with this work and/or finding out more about other ACTS activities should contact student president Marten Beels or faculty advisor Harold Underwood.

Also see photo on back page.

Department welcomes Barbara Ressler as new faculty member



Barbara Ressler

After a national search, we welcome Barbara Ressler to the department as a new faculty member who will begin full-time responsibilities in fall 2006. During fall 2005, Ressler served as a part-time adjunct instructor for the General Physics (PHY 212) lab and continues this semester (spring 2006) by teaching the elective Topics in Engineering (ENGR 495) course on bioengineering, an area of her expertise. Ressler received her Ph.D. in mechanical engineering from the Massachusetts Institute of Technology where she was a Whitaker Foundation Fellow, and obtained

a B.S. in Biomedical Engineering from Northwestern University. After finishing graduate school in 1999, she spent five years with the Genzyme Corporation's Biosurgery Division in Cambridge, Mass., where she developed manufacturing processes for cardiac and cartilage cell therapies.

As of January 2005, Ressler has owned a consulting business in Mechanicsburg, Pa., where she moved with her husband, Kevin, as a result of a job transfer for him. Her family also includes two young children: Brianna, age 5, and Owen, age 2.

Some places where our graduates (since 2001) are working

AAI Corporation
ARDEC
AKF Engineers LLP
Barton Associates
Bergey's Electric, Inc.
BIC World Missions Office
Bitterman Scale Co.
Black and Decker Corp.
BPMI
Calcery Christian Academy
Cambrex BioScience
Camcraft, Inc.
Cardone Industries
Commerce Bank
Concord Atlantic Engineers
Consulting Engineering Services
Department of the Navy
Dilling Mechanical Contractors
Drexel University
E.B. Webber

East End Christian Church
Electric Boat
Evans Engineering
Flowserve Corp.
Garden Spot Electric, Inc.
Garrison Engineering
Gatter and Diehl
General Dynamics Robotic Systems
Grundfos Pumps Co.
Hauser Therapy Services, Ltd
IBM Corporation
Inaifa Roof Systems
Infineon Technologies
Ingersoll-Rand
Innotec
Integrated Building Controls
Jerr-Dan Corp.
Johnson Matthey
KEEN Engineering
Lancaster Labs

The Lee Company
Lockheed Martin
Locus Discovery
Master Manufacturers
Mauell Corporation
Maugus Manufacturing
Metso Automation
Metso Materials
Morefield Communications
Moravian College
Mott's, Inc.
Moxley Electronics
NASA Goddard Space Flight Center
NAVAIR
New Enterprise Stone & Lime
Nextel Communications
North Carolina State University
Oldcastle Glass Telford
Penn State University
Pheonix Contact

Philadelphia Water Dept.
Remington and Vernick Eng.
Sensenich Propeller
Sigma Electronics, Inc.
Stone and Webster
Stonybrook School
Surface Radar Division
Synergy Investments
T.B. Wood's Sons Company
Tikiny Arsenal
Trane
UPS
U.S. Air Force
U.S. Army
U.S. Department of Defense
U.S. Navy
U.S. Patent and Trademark Office
Wiley and Wilson, Inc.
York International

Note: If you don't see your company, organization, or institution here, please contact us or the Office of Alumni to let us know, and give us an update. Thanks!

Department wishes farewell to Job Ebenezer

by Harold Underwood



Job Ebenezer

After five years of service as a visiting assistant professor for the Department of Engineering at Messiah College, Job Ebenezer has announced his intention to retire at the end of the spring 2006 semester. Ebenezer joined us in spring 2001 after serving with the Evangelical Lutheran Church in America in their headquarters as the director of environmental stewardship and hunger education. As an engineering faculty member at Messiah College, he taught courses

on statics, dynamics, thermodynamics, heat transfer, general physics, and global sustainability and general education courses on the Dalits of India.

Some of the student groups and activities for which he has served and provided leadership include the Hunger and Homeless Coalition, Service and Learning Together (SALT), Agapé Center Service Day projects, establishing urban gardens at the Silence of Mary House and Catholic Worker House in Harrisburg, Pa., and constructing two buildings using straw, one

in Harrisburg and another near Elizabethtown, Pa., in a Lutheran church camp. Ebenezer shared personal details of his journey of faith and call to service through a Presidential Scholars Lecture entitled "Called to Serve the Poor through Technology."

As a next step in his journey beyond Messiah College, God willing, he plans to promote "Earthkeeping Ministries" in churches and work with the Brethren in Christ church in Zambia. When he visited their churches recently, he found opportunities to promote container gardens, pedal power devices, solar pasteurization devices, and sustainable buildings constructed with grass.

As he prepares for this transition, Ebenezer shares the following words of reflection with us: "I have been promoting conservation of energy, water, food, and other resources at Messiah College. Recently some students, led by Ross Billings, have launched a water conservation program. I hope to see this conservation effort extended to other resources. I hope and pray that Messiah will live up to the Anabaptist values of frugality and earthkeeping and be a model to other institutions."

We would like to thank Ebenezer for his presence and service with us during these years and for modeling his vision through acts of wisdom and grace. We wish him many blessings as the Lord leads him onward.

P.O. Box 3034
One College Avenue
Grantham, PA 17027

Address Service Requested

The mission of Messiah College is to educate men and women toward maturity of intellect, character, and Christian faith in preparation for lives of service, leadership, and reconciliation in church and society. Graduates of the engineering program will therefore be technically competent and broadly educated, prepared for interdisciplinary work in the global workplace. The character and conduct of Messiah engineering graduates will be consistent with Christian faith commitments. We accomplish this mission through engineering instruction and experiences, an education in the liberal arts tradition, and mentoring relationships with students.

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First accepted students preview day



Marten Beels '06 shows accepted student and parents about ACTS using demonstrations of Software Defined Radio (SDR) and Automatic Position Recording System (APRS).

On Monday February 6, 2006, the Department of Engineering participated with the School of Mathematics, Engineering, and Business in our first Accepted Students Preview Day. The purpose was to host newly accepted students and their families and introduce them to the Messiah College campus, Frey Hall facilities, faculty, and current students. Several planned events were held, including a welcome by our dean, Ray Norman, an introduction to major areas in the school by chairs and faculty, and regular classes for the accepted students to visit during the morning.

After lunch with faculty, tours were offered of Frey Hall and the Collaboratory held a presentation/fair, featuring active student project groups using displays on tables in Frey 68. In the future, the engineering department hopes to couple Accepted Students Preview Day with the already established and successful tradition of Engineer's Day (weekend) for prospective students.