



The Flightline



Volume 42, Issue 9

Newsletter of the Propstoppers RC Club

AMA 1042

Sept 2012

President's Message



Time flies and here comes the last Picnic of the year Sept. 29th this works with a church event ,will discuss at the meeting.

Jeff F. will help with this picnic .as we want to put on a Show for the Church Time 4:00 till 5:30 so please come out.

The dates and times are in for indoor flying at Tincum school. Brookhaven Borough gym dates are coming.

Nomination for the club officers will be held in October, per Article 8 in the byelaws. Anyone wanting to run may make the offer at the Oct meeting.

Dick Seiwel

Agenda for September 11th Meeting

At Middletown Library;

Doors open 6:00, meeting at 6:30

1. Membership Report
2. Finance Report
3. September Picnic Plans
4. Indoor Program Discussion
5. Show and Tell

Minutes of the Propstoppers Model Airplane Club August 14, 2012 at Christian Academy field on a wet and threatening evening

Call to order took place at 6:35 PM by president Dick Seiwel
Roll showed 5 members and 1 guest present
Minutes of the July meeting as published in the newsletter were approved
Treasurer's report was deferred

Old Business:

The president informed us that both fields are in good shape and have been mowed close for easy takeoffs. He also wanted us to take note that next month the meeting will be back at the Middletown library.

New Business:

The club marked and regretted the passing of one of our longtime members, Sam Nevins age 94 who passed away two weeks ago.

Show and Tell:

Mick Harris showed an electrified Dina – Mite from 1954 which was originally a rubber model produced in England. He flew it successfully at the field. He demonstrated the collapsible landing gear feature of the model which was popular at the time.

Adjournment took place at 7:05 PM.

Dick Bartkowski, Secretary

2012 / 2013 Tincum Indoor Flying Program Requested

Mike Black has once again requested the use of the Tincum School gym for indoor flying. The requested dates are;
The first Friday of the months from November through March from 6 – 9 PM. He should hear back from the school in a week or two about final approval. November 2 December 7 January 4 February 1 March 1
This must be our twelfth year or so of this popular activity. Here are some pictures from past indoor meets.

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continued

Calendar of Events

Club Meetings

Monthly Meetings
Second Tuesday of the month.
Middletown Library
Doors open at 6:00, meeting at 6:30 pm.

11th September

Tuesday Breakfast Meeting
Tom Jones Restaurant on Edgemont Avenue in Brookhaven. 9 till 10 am. Just show up.
Flying after at Elwyn or CA Fields 10 am.

Regular Club Flying

At Christian Academy; Electric Only
Monday through Friday after school till dusk
Saturday 10 am till dusk
Sunday, after Church; 12 pm till dusk
At Elwyn field, gas allowed, almost any time
but be respectful to those who live there.
Expert flyers only due to proximity to Rt. 352

Indoor Flying

TBD

Special Club Flying

Saturday mornings 10 am
Wednesday Helicopter evening in summer
Thursday evenings in the Summer
Tuesday mornings 10 am weather permitting
after breakfast.

Check our Yahoo Group for announcements;
<http://groups.yahoo.com/group/propstoppers/>

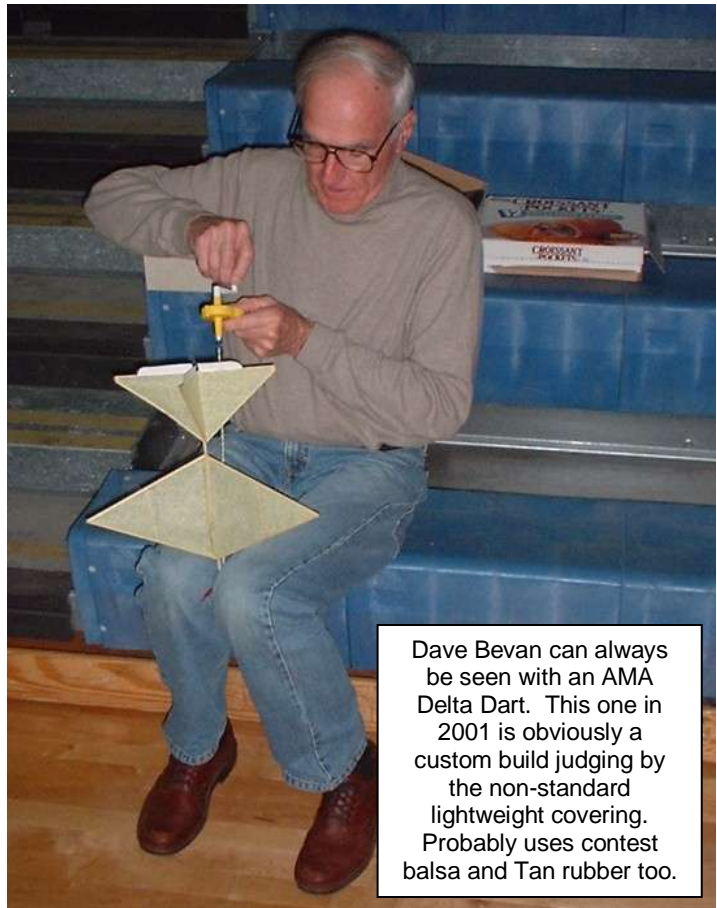
Beginners

Beginners using due caution and respecting club rules may fly GWS Slow Stick or similar models without instructors at Christian Academy ONLY. The club also provides the AMA Introductory Pilot Program for beginners without AMA insurance.

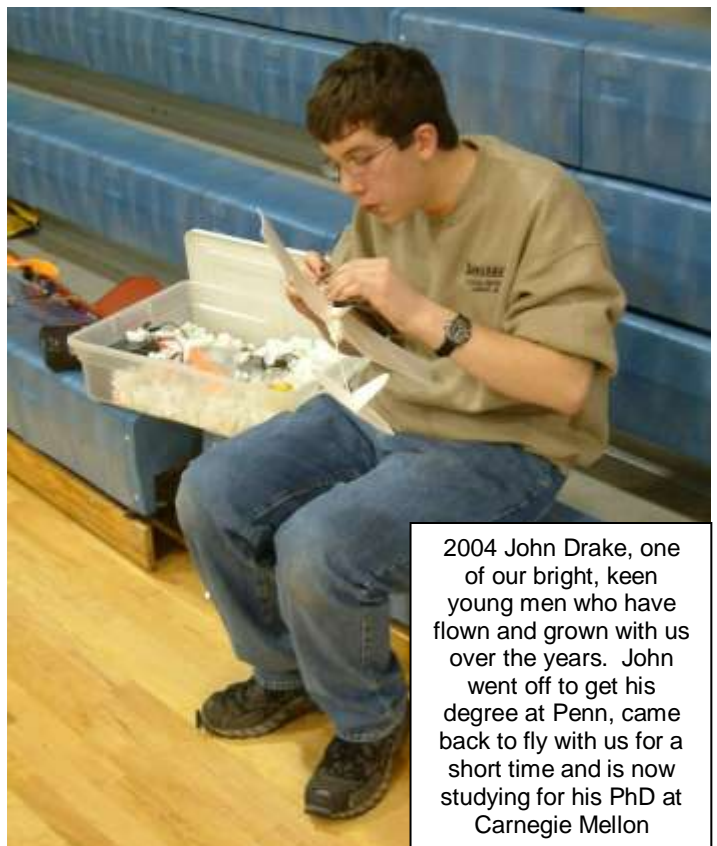
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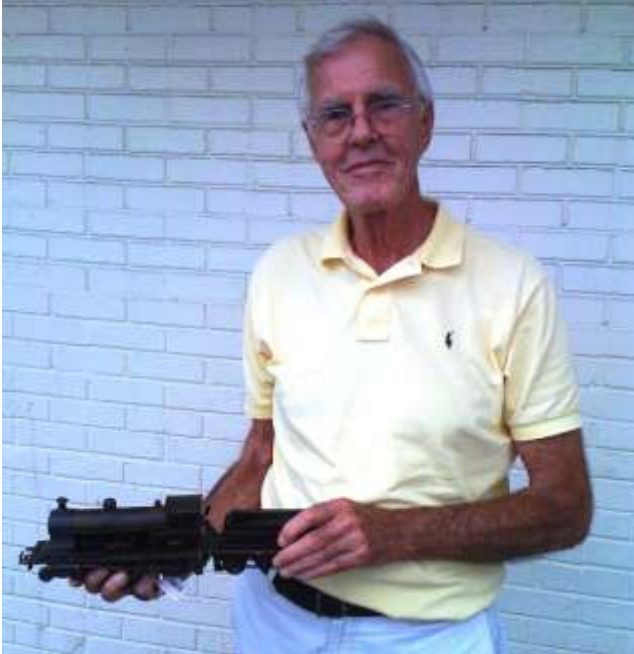
Dave Bevan can always be seen with an AMA Delta Dart. This one in 2001 is obviously a custom build judging by the non-standard lightweight covering. Probably uses contest balsa and Tan rubber too.



2004 John Drake, one of our bright, keen young men who have flown and grown with us over the years. John went off to get his degree at Penn, came back to fly with us for a short time and is now studying for his PhD at Carnegie Mellon

New Members and Old Members at the Field

We are fortunate to have a continuing flow of new members to our club. Murray Wilson has joined us via his friendship with Eric and the steam train hobby.



Phil Whittingham has been out flying with us and joined this month. He has started with this small foamy but has since bought some planes and accessories from Jim Barrow who is downsizing his hanger due to eyesight problems with up and away planes.



Matt Borden joined the other month. He is into helicopters but says he wants to fly planes soon.



Long time member who we haven't seen much this past few years, Joe Mesko, is trying out a new home-built and programmed Quad Rotor helicopter. Joe made this model from parts he bought via <http://diydrone.com/>. He then programmed the microprocessor and succeeded in making his first stable and controllable flights. Joe will do a write up on his work for a future newsletter.



So come out to the fields and say hi to the new members and welcome back those we haven't seen for a while.

Dave Harding

AeroVironment's Hummingbird UAV

From the American Helicopter Society Journal

We don't often see an aircraft flying during the presentation of a paper at an AHS Specialists' Conference, but those who attended the one in San Francisco in January of 2012 did. Matt Keennon of the AeroVironment company flew his battery-powered Hummingbird all around the conference room.

The company, founded by Paul MacCready of man-powered airplane fame, has been busy developing unmanned aircraft for the military for many years. In 2005, DARPA opened a competition for a "Nano Air Vehicle" (NAV) in the shape of a hummingbird that could carry a color television camera the size of a pea into an open window or door to see what was in there.

AeroVironment won the contract in 2006 and assigned Keennon and an experienced team to the project. Four and a half years and \$4 million later, the "Hummingbird Drone" was a cover subject for *Time* magazine and I was invited to the plant for a personal demonstration.

The development had gone through fourteen prototypes involving approximately 300 investigations of wing



shapes and materials and many arrangements of the flapping mechanism which rotates and twists the wings. Much of the work was done under a microscope.

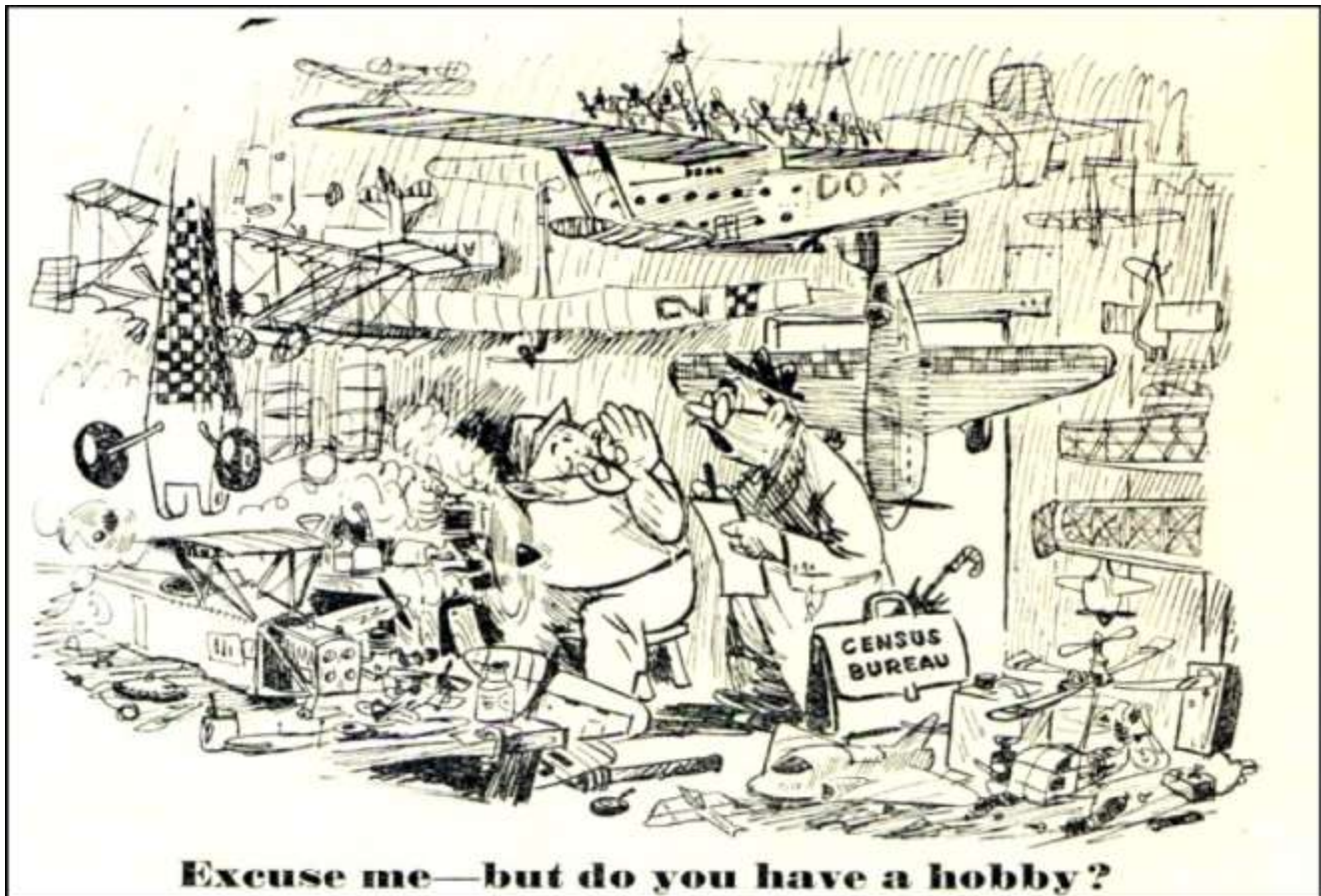
The result is a tiny aircraft with only two flapping wings and no tail surfaces that can climb, pitch, roll, and yaw in response to the remote pilot's wishes. It has a wing span of 6.5 inches and the gross weight is less than a AA battery. The wings beat thirty times per second, and it can hover and fly forward at eleven miles per hour. It has an endurance of eleven minutes before the battery needs

recharging.

Since it is inherently unstable, the control system includes miniature gyros and actuators to stabilize it. It can be controlled by a pilot using a flight controller who has it in plain sight or from what he sees "heads-down" on his monitor from the camera.

During my visit, I saw it fly and was also shown a PowerPoint presentation of the project. One slide that got my attention showed that the maximum Figure of Merit was only 0.2. This low value, compared to a higher value for a rotor-supported aircraft, is due to two sources. The first is the high drag coefficients associated with the very low Reynolds numbers that exist. The second, compared to a rotor where the blade elements are producing continuous lift, is that on a flapping wing during part of the stroke, the wing is not producing lift, but still has drag.

While real hummingbirds are essentially silent while hovering, the Nano Hummingbird sounds like a giant beetle. This detracts from DARPA's stealth desire. Feathers are needed.



Excuse me—but do you have a hobby?

Over the past three years, tremendous progress has been made in pursuit of the AHS Igor I. Sikorsky Human Powered Helicopter (HPH) Competition, with a half dozen official registrants for the Competition. Recent progress has been made by several teams, with three related here.

On June 21, the University of Maryland established a (currently uncertified) world record of 50 seconds – more than 2.5 times the previous maximum demonstrated duration. In addition, the NTSWorks Upturn made its first flight on June 24 and another team, AeroVelo, hopes to fly its Atlas HPH in August.

A Little History

In 1977, the Gossamer Condor human-powered aircraft won the first Kremer Prize for flying a figure 8 around two marker ½ mile apart. Inspired by this accomplishment, AHS looked into the feasibility of a human powered helicopter. Based on at least six attempts that had already been made and studies published in England in the 1960s that indicated that an HPH was perhaps possible, an ad hoc AHS committee found that it must be feasible. Since a figure 8 was thought too difficult initially, the first step was set to be just hovering.

In 1980, the AHS Board of Directors approved the initiation of the Igor I. Sikorsky HPH Competition, initially with an award of just \$10,000 pledged to the first successful controlled flight of a human powered helicopter that meets all of the conditions of the rules (the prize was soon raised to \$20,000 and much later to \$25,000). The key requirements are to demonstrate a one minute hovering time and a momentary achievement of 3 m altitude, while staying within a 10 meter square (see www.vtol.org/hph for the full rules).

In the first dozen years, about 17 HPH machines were built. California State Polytechnic University at San Luis Obispo students built a series of

machines, culminating in their "Da Vinci IV" with a 100 ft (30.5 m) diameter rotor machine in 1989. It established a record by flying for 8.6 seconds and reaching a height of 8 inches. The design used a 100 ft (30.5 m) diameter two-bladed rotor driven by propellers at the tips. The Cal Poly reaction-drive rotor aircraft weighed 96 lb (43.5 kg).

In Japan, Professor Akira Naito of Nihon University was responsible for five attempts at an HPH between 1985 and 1994. The final version, Yuri-1, achieved an altitude of 0.2 m (8 inches) and a flight duration of 19.46 seconds. The quadrotor had a 10 m (33 ft) diameter rotor on each arm of the cruciform structure and weighed 38 kg (83 lb). (Apparently neither the Da Vinci and Yuri successes were certified by the Fédération Aéronautique Internationale (FAI), the world record-keeping body for aviation.)

After these two breakthroughs, later HPH attempts failed to get off the ground and the competition lay stagnant.

In 2009, the AHS HPH coordinator, Matt Tarascio, secured from Sikorsky Aircraft Corporation a pledge of \$250,000 as the prize for the AHS Igor I. Sikorsky Human Powered Helicopter Competition, which Sikorsky President Jeff Pino announced at the AHS Annual

Forum 65. With the deluge of sudden interest in the AHS Sikorsky prize, Tarascio formed the HPH Committee, now headed by Ben Hein.

Gamera

In 2008, students at the University of Maryland's Alfred Gessow Rotorcraft Center began considering the AHS HPH Competition. Inspired by the success of the Yuri-1, they extrapolated the design to an even larger cruciform quadrotor, with 13 ft (42.6 ft) diameter rotors and a total weight of 48.6 kg (107 lb). The HPH was named "Gamera" after the giant flying turtle of Japanese monster movies, in homage to the University of Maryland's Terrapin mascot and to Nihon University in Japan.

On July 13, 2011, the Gamera set an FAI-recognized hover duration record of 11.4 seconds, driven by biology student Judy Wexler. (See *Vertiflite* Fall 2010 for more details on Gamera I.)

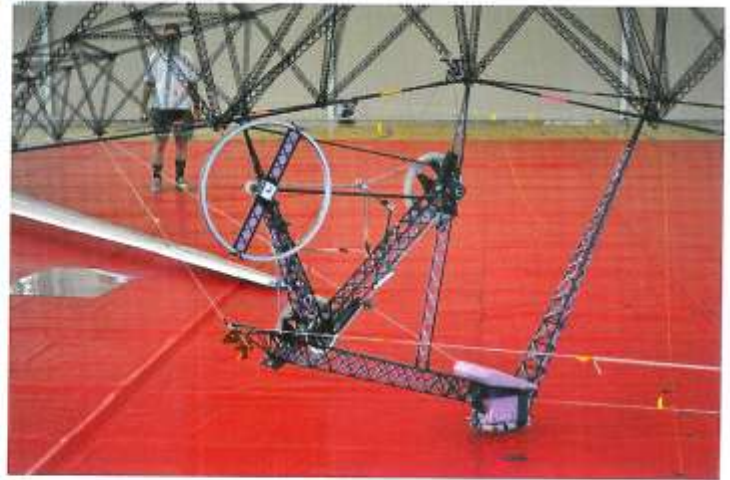
Over the past year, the University of Maryland has publicized much of its research in a number of conference proceedings and established a website with their papers, videos and other details on their efforts (www.agrc.umd.edu/gamera), adding to the body of knowledge of human powered helicopter science and engineering.



University of Maryland has established what should soon be an official world record of around 50 seconds with its Gamera II, shown here during its record flight on June 21. (Photo by Earl Zubkoff.)



University of Maryland team of students and faculty advisors pose with Gamera II. (Photo by John Consoli.)



The Gamera cockpit was improved. Miniature trusses comprise the macro truss structure. (AHS photo.)

Maryland students have now developed a new aircraft, Gamera II, which is 30% lighter and capable of flights over 60 seconds – one of the key pillars of the AHS Igor Sikorsky HPH Competition. The Gamera II had significant improvements in structural approach, cockpit, transmission and rotor design. The cruciform structure of the new vehicle is a trusswork of trussworks, further reducing the weight and increasing the stiffness. Although the rotors are the same diameter, taper was introduced, as well as a sixfold increase in root stiffness. Each blade was reduced from 3.3 kg (7.3 lb) to 2.0 kg (4.4 lb) – a 40% reduction.

Testing began in mid-June and a media event was held on June 20. Regular flights were made beyond 40 seconds, but often the lack of control would require aborting the flight to avoid impacting the walls of the armory where it was being tested. The longest flight was approximately 50 seconds on June 21, driven by Kyle Gluesenkamp, a mechanical engineering Ph.D. candidate.

candidate. This was witnessed by an observer of the National Aeronautic Association (NAA), the U.S. affiliate of FAI. The NAA will review the evidence to determine the exact duration of flight and certify this as a new official record, which will be recognized as a world record by FAI.

Additional testing is planned for later this summer. The other student power plants who flew Gamera II were Colin Gore and Dennis Bodewits, each with similar results. Judy Wexler's world record for flight duration by a female

pilot still stands.

The University of Maryland team is continuing to refine Gamera II and studying approaches to accomplish the altitude and control requirement of the AHS Sikorsky Prize.

This is a part of an article in the American Helicopter Society Journal. To be continued in the next edition.

Dave Harding