The Flightline

Volume 44, Issue 7 Newsletter of the Propstoppers RC Club AMA 1042 July 2014

President's Message

The rain has slowed down and the CA field is in great shape: come one come all.

All show & tells are welcome at the monthly meeting, please bring them in.

If the weather looks good bring your planes and we will have a short meeting and then go flying.

Elywn field is in good shape and cut on Tuesday so it's at its best.

Some of our members are flying on there after Tuesday breakfast and at weekends. Check your emails and join them. Remember this field is ***FUEL.*** Meeting doors will be open 7:00 meeting will start 7:15 and fly when we have done chewing the fat.

Dick Seiwell, President

Agenda for July 8th Meeting At Gateway Community Church, At our CA Field site;

Meeting 7pm till 8:30?

1. Show and Tell
2. Membership Report
3. Finance Report
4. Club Calendar Review

INSIDE THIS ISSUE

Minutes of the Propstoppers Model Airplane Club

June 10th at the Christian Academy meeting room in Brookhaven Pennsylvania

Call to order by Vice-President Al Chung took place at 7:00 pm
Roll call by membership chair Ray Wopatek showed 17 members present
Treasurer's report was presented by Pete Oetinger
Minutes of the May meeting were approved as published

Old Business:

The membership chair informed us that dues have been received from almost all members. Several members volunteered for duties at the June club picnic.

New Business:

The president informed us the Christian Academy field has been mowed and is flyable but be careful of wet areas.
Various members described their recent model mishaps and solutions.

Show and Tell:

Al Chung showed a metal tool box he uses for charging Lithium batteries in a safe container.
Ray Lauser showed 2 FliteTest foam board planes built from plans available online.
The planes were called the Flyer and a Spitfire. Both planes use the same power pod with battery, receiver and motor. The same pod fits several of their planes.
Short kits are available or the planes can be built from plans with Dollar store foam board and glue.

Adjournment took place at 8:10 PM

Dick Bartkowski, Secretary

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Calendar of Events

Club Meetings

Monthly Meetings
Second Tuesday of the month.
Gateway Community Church at the Christian Academy. Doors open at 7:00
Next Meeting; 8th July

Tuesday Breakfast Meeting
Tom Jones Restaurant on Edgemont Avenue in Brookhaven. 9 till 10 am. Just show up.
Flying after in the summer at CA or Elwyn Field 10 am. Weather permitting.
Indoors at the Brookhaven Gym in bad weather 10:30-11:30 See dates allowable.

Regular Club Flying

At Old 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 or Electric
Monday through Saturday 8 am till dusk
Sunday 12 pm till dusk

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;
Hhttp://groups.yahoo.com/group/propstoppers/

Beginners

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

Propstoppers RC Club of
Delaware County, Pennsylvania.
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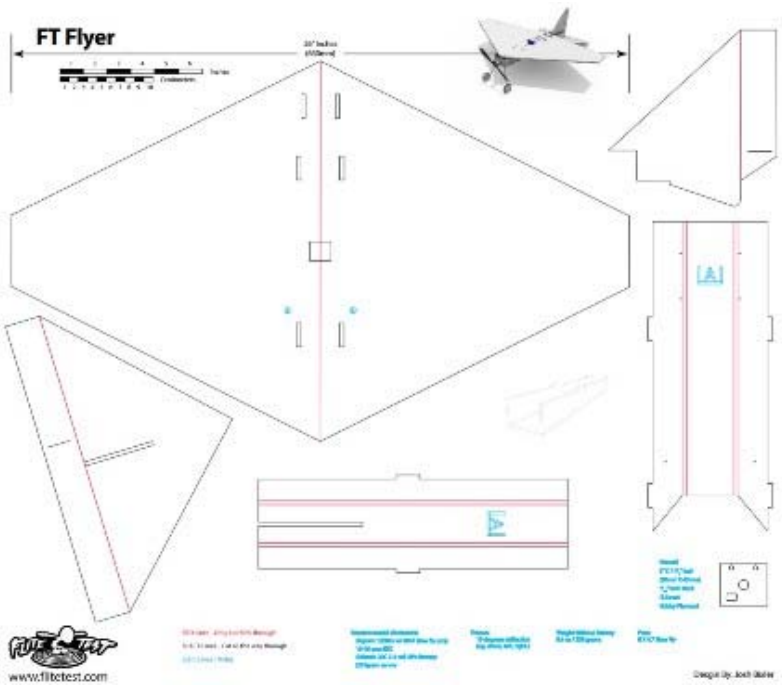
Propstoppers Web Site; www.propstoppers.org

Show and Tell

Ron Lauser showed the Dollar Store foam board FT Flyer he is building from plans off the internet;
Hhttp://flitetest.com/articles/FT_Flyer_Scratch_build
For the Spitfire see Hhttp://flitetest.com/articles/ft-spitfireH and Hhttp://flitetest.com/articles/ft-spitfire-build



Another Great Club Picnic

There was a good turn out and plenty of flying at the picnic and best of all there were a number of family members who came out to watch the fun and enjoy President Dick Seiwell's cooking. Al Cheung and family produced a couple of videos of the affair.

Chris Maruzzi brought this magnificent Sukoy acrobat powered by a motorcycle engine, well, it looks like one. He also brought his mother to enjoy the day. You weren't trying to justify your "investment" in your hobby, were you Chris?

Al Cheung's Videos

GoPro Camera was mounted to the Flyzone Beaver. Camera was mounted to the plastic mount that was part of the display case that came with the camera. It makes a great based for mounting on a variety of objects. The mounted camera on the base was then attached to the bottom of the plane using rubber bands. The rubber bands were attached to little hooks fashioned out of picture hanging hooks that were screwed into the holes in the fuselage for mounting the float struts. I also used these hooks for guide wires when mounting skis on this plane. Obviously I used many more rubber bands to secure the camera in actual flight. The GoPro settings were medium field view (not full wide angle), inverted (since camera was mounted upside down), and 1080 HD video.

Here is Al's Beaver with skis and floats. A truly versatile bird, just like its big parent the de Havilland Beaver.

The Flyzone Beaver had plenty of power to lift off and fly with the camera, but the take off runs are a little longer. I have also used a similar set up for the Eflite Apprentice with long rubber bands attached to the wing hold-down struts. The Apprentice also has plenty of power to fly with the camera.

Takeoff is a bit of a challenge as the camera drags through the grass, but these popular units can take it. See all manner of videos taken with GoPro cameras here; http://www.youtube.com/results?search_query=gopro+videos
They are the favorite accessory for bike riding, car racing, skiing, diving and even voyeuring! So popular are they that this week the company went public, listing on the Nasdaq with a share value taking the company net worth to $3 B.

Here are some stills taken from the video. For those of you that might want to capture such pictures from a video here is how you might do it. First run the video in full screen mode and seek the pictures you wish to capture. Note the time in the video where they occur. Then re-run the video pausing it just before the frame you want. You should be able to grab the “progress button” that moves across the bottom of the video and nudge it a frame at a time till you get the one you want. Then hit Alt and prtScn at the same time. This will save the image to the clipboard. Next open a graphics program. I use Corel Photo but Photoshop or even Microsoft Paint should work. Go to File then open from clipboard and hey presto; your captured image should be opened in the program screen.
You might then want to crop it to frame the interesting stuff and eliminate the clutter, then save it as a jpg file. And there you have it, a nice still shot from a video, like those below.

Bandits at eleven o’clock low.

We have to thank Al Cheung’s Video Team Jennifer and Natalie (Producer and Director Al?) for the interesting videos which can be found here; https://www.dropbox.com/sh/h3aknmfcm0dca7n/AADP3qnMWhpON-UdfVMfjp8ia

Jeff Frazier's 3D Hobby Shop Extra 330sc 74"

Couple of nice pictures of Jeff's latest aerobat that came too late to make the last newsletter. Jeff, this plane needs a pilot!

Flying Scale Model of the LTV XC-142 VTOL Transport

The world of vertical lift is hugely complex and this is probably the reason that so many programs have produced so few successful air vehicles. What seems easy and obvious as a simple concept may become completely intractable in practice where it has to meet stringent operational and safety criteria.

The XC-142 grew out of a mid 1959 Tri-Service program to investigate the feasibility of a VTOL transport that could fly much faster than the current helicopters. The thinking was runways would be unavailable in a real shooting war so produce a vehicle that could fly out of anywhere.

The Tilt Wing concept had been proven by Boeing (then Vertol) VZ-2, which flew in the late 1950s.

The Tri Service Transport program let a contract to Ling Temco Vought to build the XC-142. While the small fleet of prototypes met all the basic performance requirements it was a monster to maintain. This was primarily due to it being build from many existing systems and parts expediently assembled to keep the prototype costs down. So the program was not taken into further production.

However, subsequent Viet Nam experience and studies of potential Cold War instabilities led the Air Force to institute a program for a C-130 V/STOL replacement, called the Light Intra-theater Transport; LIT. We at Boeing worked on the program through the mid 1960s doing a substantial amount of design and development work until the Air Force cancelled it.

Now among the complex problems you have to solve in a VTOL air vehicle is the stability and control over the entire flight envelope. And since the airplane can fly with a range of wing and propeller tilt angles between vertical and horizontal the combination of configuration, speed and attitude is vast. The wing may or may not be stalled and in varying amounts producing huge ranges of forces that must be controlled, and stability achieved through automatic control. The of course the flight envelop includes not only hover but rearward and sideways flight.

To some extent these problems were solved for piloted air vehicle configurations, including the Tilt Wing XC-142 and the Tilt Rotor V-22. On the V-22 the wing remains in the horizontal position, but you still have to handle a range of wing loading conditions.

Fast forward to the programs that took these VTOL approaches into the **UAV** realm and you find Boeing programs for two such machines; the Heliwing and the Canard Rotor Wing; CRW.

The Heliwing concept was for a VTOL UAV where the entire vehicle would rotate with the wing from hover to forward flight.

The CRW concept was for a stopped rotor configuration that would takeoff and hover like a helicopter then transition to a wing borne mode while the rotor was stopped, whereupon it would fly like a fixed wing airplane, albeit one with three lifting surfaces. The idea was a VTOL UAV with high speed capability.

Of course both of these vehicles had to be stable and controllable through the whole flight envelope, as did the XC-142. The difference being, in addition to the unique configurations, it must be done entirely through automatic means.

Sad to say both programs foundered in failure at this very point and both were cancelled after crashes from such failures, after spending tens of millions of dollars.

OK you say, so what? Why are we reading this (I will be taking a head count on how many of your are!)

Well, some chap just went ahead and built himself a XC-142 model that demonstrated the full flight envelope successfully in an RC model **ON THE FIRST FLIGHT! Here is his model.**

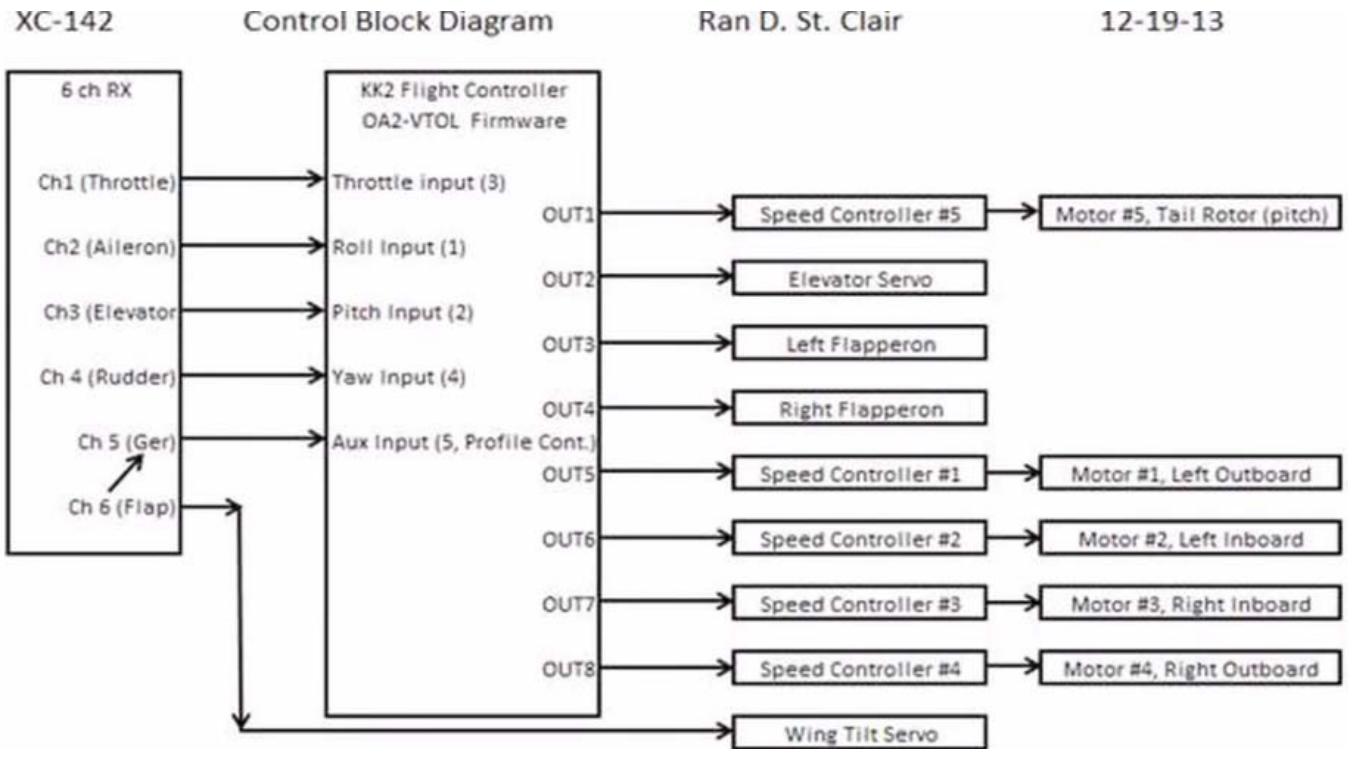
First, let's read his description of his work;

The XC-142 is a stand-off scale model of a full scale VTOL transport. Five full scale aircraft were built in the 1960s and evaluated in various roles. Despite meeting most of the requirements it was never developed further. It had high vibration levels, poor lateral stability in forward flight and a tendency towards a long period pitch oscillation in hover that eventually resulted in a crash and ended the program. The model has similar aerodynamic issues and it is only though the capability of the OpenAero2-VTOL firmware that it can be made to fly and fly well. The flight controller provides 3 axis stabilization in hover mode and stabilization in roll and yaw for forward flight.

Unlike the full scale aircraft, which had variable pitch propellers for control, the model uses fixed pitch propellers. In hover mode it is similar to a tri-copter except that there are 4 motors up front instead of 2, and the tail rotor is very small, lightly loaded, and doesn't tilt to control yaw. Instead the ailerons are used for yaw control. In forward flight it is a normal airplane except that it uses differential motor thrust instead of rudder.

Flight Controller: KK2.0
Flight Controller Firmware: OpenAero2-VTOL
Radio: Spectrum DX7s TX with 6 ch RX, AR6200
Tilt Wing Servo: Hitec, HS-645MG
Elevator Servo: Hitec, HS5055MG
Aileron Servos: Hextronix, HXT900, 2 each
Switching Battery Eliminator Circuit: Castle Creations CC BEC 10A (peak)
Main Motor ESC: CarbonBird, 18Amp, MultiCopter, 4S, Double Heatsink, 302W, 4 each
Tail Motor ESC: Castle Creations, Phoenix-10, 10A, 4s
Main Propellers: GWS, 9"dia. x 5" pitch, 3 blade, Counter Rotating
Tail propeller: GWS 4.5" dia. x 3" pitch, 2 blade
Battery: 3.3Ah, Li-Po, 3 cell, 11.1V
Wing Span: 39"
Wing Area: 185 sq. in.
Weight: 3 lb. 2 oz.
Maximum thrust at full throttle: Over 5 lb.
Construction: Carbon Fiber and Depron (foam)
Designer/Pilot: Ran D. St. Clair

Here is the block diagram of his control scheme



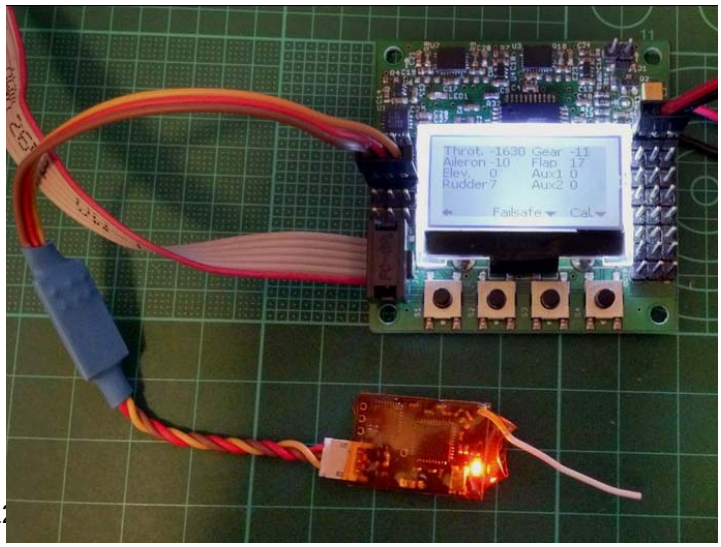
Of course the stability is largely controlled by the KK2 Flight Controller with OA2- VTOL Firmware.

I found the video of his first, second and third flights stunning. It was completely controllable and demonstrated the full flight envelope on the first flight. Here are a few stills from the video. http://www.youtube.com/watch?v=ZOtVyxwNHQg

Here is a series showing the conversion from hover mode wing up through full transition to forward flight wing down.

The model is a very simple scratch built foam design with conventional motors and controllers. Servos control wing tilt, ailerons/flaperons and horizontal tail incidence (elevator). Pitch control in hover and slow speed flight is via a small motor/propeller mounted vertically in the tail (just like the VZ-2). Yaw control in hover is via the flaperons in the wake of propellers and yaw control in forward flight is via differential propeller thrust, side to side.
Of course the magic is in the KK2 Flight Controller and OA2- VTOL Firmware. I can't imagine how he got the coupling and rates in the acceptable region before first flight, but he did.

Here is the Flight Controller connected to the Spektrum Rx.
And the most amazing thing is this controller only costs $29 at Hobby King!



I just can't tell you how mind boggling is the vast chasm between the many $Millions spent on full size piloted programs to attempt to achieve this kind of success ……. I just can't express it!

So, go forth Propstoppers, who is man enough to make a flying model of Delaware County's VZ-2?

Dave

HISTORY OF AMBROID GLUE

An article published in the May 2012 edition of MaxFax, Stew Meyers, Editor

While cruising the web, I stumbled across this fascinating history:

Before Ambroid glue, you patched the birch bark or canvas on your canoe with spruce gum. It was an art and an ordeal. You gathered dried knots of pitch from spruce or pine trees. These were nurtured with patience from the trees by creating gumming notches. You harvested the knots and took them on trip with you. When you sprung a leak you started up a fire and rendered them with fat. The gum was applied while still hot. And if you didn't get your mix just right!

In 1900 the canvas canoe was on the cusp of revolutionizing canoeing and launching the canoe-building industry. Charles Seavern, president of Howe & French, Inc. a Boston chemical company, was an ardent trout fisherman and canoeist. He was more than familiar with the time-consuming, messy gumming process from his Maine fishing trips in birch bark canoes. Howe & French processed used tortoise-shell glasses to recover camphor. The leftover celluloid was burned. Celluloid had made its debut as the first plastic. It was little more than cellulose, obtained from plants such as cotton, and camphor the plasticizer. As plastic was waterproof, it occurred to Seavern that a replacement for gum could be made from this waste. No more pitch gathering. No more fires. No more rendering. Just open a tin can and apply. It might have some color problems but the bottom of a birchbark canoe was not a designer's paradise. And since his company had waste celluloid to burn, the price of the raw material couldn't be beat.

With testing, Seavern found that his glue exceeded his original hopes as an adhesive, not only for birch bark, but the new canvas canoes as well. It was fast-drying, flexible, strong and above all, waterproof - as the packaging would later boast. Two words, amber (its color) and celluloid were combined to create the brand name Ambroid.

The liquid plastic was sold in small, round tins to sporting-goods outlets and in larger one-gallon cans to canoe-repair shops. Old Town Canoe Company became one of the first customers of the Ambroid Company, apparently even for a time, providing a tube with each canvas canoe sold. Old Town still sells Ambroid in its Wood/Canvas Repair Kit. Hudson's Bay Company became another early customer, selling large quantities across Canada through its posts and inland stores to hunters, trappers, surveyors, prospectors and natives. Ambroid is still sold by the successor, The North West Company, which operates the inland stores.

Old-time builders swear by the stuff for patching canvas. "I had an old canoe come into my shop with a complete double bottom of canvas glued on with Ambroid," says Rollin Thurlow, of Northwoods Canoe Co. in Maine.

Northern Ontario-based Camp Keewaydin, founded in 1894, is the world's oldest canoe-trip operator. As one of the few institutions still running whitewater in wood-canvas canoes, its six-week trips into remote areas carry a pound and a half of Ambroid. As you can imagine, the staff are adept at handed-down, backwoods, canvas-repair tricks like double-patching and burning on a patch, all with Ambroid.

The reconstituted tortoise-shell glasses did not immediately go into lead tubes because the lead caused the cement to gel. Citric acid was eventually added as a preventive. With the adoption of the tube, it replaced tin cans on canoe trips. Old-timers have told the Ambroid Company that it lasts for decades in the tubes. (Today, lead tubes have been replaced for safety and health with annealed-aluminum tubes.)

Not only was the amber liquid one of the world's first plastic glues (chemists like to point out it is not a glue but a cement), but it became one of the most widely-known brand names in the wood-canvas canoe industry. You didn't leave home without it. Its ease of use revolutionized repairs and must have helped accelerate the popularity of the canvas canoe.

The original Ambroid, marketed as Original Liquid Cement, is still popular with hobbyists who use it on wood models because it bonds so well to porous materials. It is widely available at hobby shops. Though sales of Ambroid to canoeists have fallen with the decline in wood-canvas canoe use over the past three decades, the first commercial canvas cement is still holding on patches and outshining today's high-tech glues.

Record Breaking UAV Model Airplane Made Record Breaking Transatlantic Flight in 2003.

Among all the hoopla about UAVs these days I thought it appropriate to remind you (or introduce you) to Maynard Hill's magnificent "UAV" achievement eleven years ago. He built a model airplane which he flew from Newfoundland to Ireland. By FAI rule the all up weight, fueled, must be less than 11 lb. The OS 61 four stroke engine was modified to burn gas at very low rpm by IC engine standards. Takeoff was flown manually then the GPS aided autopilot engaged. Landing in Ireland was the reverse procedure. http://news.bbc.co.uk/2/hi/europe/3145577.stm

The late Maynard Hill and some of his fleet of TAM-5 Transatlantic UAVs

Name:	TAM-5
Weight:	Dry: 5.96 lb (2.705 kg); Fully fueled: 10.99 lb (4.987 kg)[8]
Time:	38 hours, 52 minutes, 19 seconds[3]
Start time:	2003-08-09 22:15:41 UTC (chosen for favorable Atlantic weather and to arrive during Irish daylight)[7]
End time:	2003-08-11 13:08:00 UTC[7]
Distance:	1,881.6 mi (3,028.1 km)[3]
Flight Altitude:	Approx. 1,000 feet (300 m)
Fuel tank:	Approx. 118 US fluid ounces (3.5 l)
Fuel:	Coleman lantern fuel with 16 US fl oz (470 ml) of Indopol L-50 lubricant additive per 1 US gal (3,785 ml). Single fuel tank in the fuselage at the CG point [9] (normal: alcohol)
Engine:	O.S. Engines 0.61 cubic inch (10cc) four-stroke, C & H Electronics CDI spark ignition system, carburetor from a "PET" O.S. 0.10 two-stroke engine
Engine Modifications:	Smaller valves in engine, custom carburetor mounted remotely, triple fuel filtration down to 1 micron, pressurized fuel tank using crankcase pressure, custom power take-off to run electronics
Cruising speed:	42 mph (68 km/h), the transatlantic flight had an average ground speed of 48 mph (77 km/h) including tailwinds
Size:	Wingspan 72.1 in (1,831 mm), Length 74 in (1,880 mm)[10]
Propeller:	Zinger wooden propeller, 14 in (356 mm) diameter, 12 in (305 mm) pitch with trailing edge sanded to razor sharpness,[3] ~3900 RPM

The Spirit of Butts' Farm (also known as TAM 5) became the first model aircraft to cross the Atlantic Ocean on August 11, 2003. The aircraft was launched from Cape Spear near St. John's, Newfoundland and Labrador, and landed at Mannin Beach near Clifden, Ireland 38.9 hours later.[1] It was recognized by the FAI as a double world record[2] flight for its duration of 38h 52 min 19 sec (FAI Record 7883) and straight line distance of 1,881.6 mi (3,028.1 km) using an autopilot (FAI record 7882); the team's use of technology also spurred the FAI to create new record categories.[2] The aircraft was controlled by autopilot for >99% of the flight in a manner similar to that used by the Insitu Aerosonde UAV "Laima" that crossed the Atlantic in 1998. The flight used 99.2% of its fuel and left only 1.5 US fluid ounces (44 ml) (or 44 minutes of flight time) remaining when it reached its destination.
The aircraft was built by a team led by Maynard Hill, a retired metallurgist. Hill had previously set 25 model airplane records and was inducted into the Model Aviation Hall of Fame in 1977. ***The Spirit of Butts' Farm*** was the 25th of 28 airframes the team had built in the attempt to cross the Atlantic; the five best models were selected for actual transatlantic flight attempts. The 25th airframe was the fifth selected for the record attempt and was re-designated TAM-5. Later, describing his reaction to learning that the flight had been successful, Hill said, "I just grabbed my wife, hugged her and cried like a baby."
The aircraft was named after R. Beecher Butts, an aviation enthusiast who allowed use of his farm for testing of the aircraft. The name echoes that of the *Spirit of St. Louis*, the aircraft used by Charles Lindbergh in his trans-Atlantic flight. The aircraft is on display at the National Model Aviation Museum. A backup plane for the trans-Atlantic effort is in the collection of the National Air and Space Museum.

A personal and historical note; Then AMA President Dave Brown wrote a piece in Model Aviation on his visit to Ireland to land Maynard's transatlantic plane, which he did;

They launched TAM-5 at 7:45 p.m. The launch was easy because of a mild west wind. Joe's climb out was quick and smooth. TAM-5 did a graceful turn toward the northern waypoint then went out of sight heading to Ireland. When Maynard awoke the next morning there was good news, the TAM-5 was still flying and was roughly 560 miles out. The next morning, Maynard was told that there had been no satellite data for three hours. The crew decided to alert those following the trail to Dublin, and called then-AMA President Dave Brown, who had volunteered to land the model.
Within minutes of saying goodbye to Dave, the model was picked up again by satellite. The team immediately called the others to alert them. They found that the model was still flying, and flying even better. It had flown over the Gulf Stream during the night. At 9 a.m. Newfoundland time (12:30 Ireland time), or 37.25 hours into the flight, the model was approximately 70 miles from the Irish coast. Its speed was down to 43 mph. Its heading was right on target at 95°. They were all very excited, and Maynard recollected the moment as "intense."
Soon enough, at 2 p.m. Ireland time the model came into sight at Mannin Beach on Monday afternoon. Dave Brown, a member of six US World Championships teams in the 1980s, confidently toggled the landing-gear switch to gain manual control of the airplane. Dave glided the model into a dead-stick landing approximately 5 feet from the designated spot. At 2:08 p.m. Ireland time

Dave wrote in his MA article that while in Ireland he was contacted by the National Aviation Association to request he represent them at the dedication of a memorial to Alcock and Brown's landing of the first nonstop Transatlantic flight in their Vickers's Vimy in 1919. Dave had spelled Alcock's name incorrectly and we corresponded on the point during which he gave me a firsthand account of both his landing of Maynard's airplane and the ceremony at the Alcock and Brown landing site. The two sites were only five miles from each other. Of course the Alcock and Brown story is a fascinating tail of one of Aviations early landmarks. You can read their account here; http://www.aviation-history.com/airmen/alcock.htm

Alcock and Brown's landing in the Irish Bog. The airplane was restored and is now on display in London's Science Museum.

Modern Replica of Alcock and Brown's Vickers Vimy