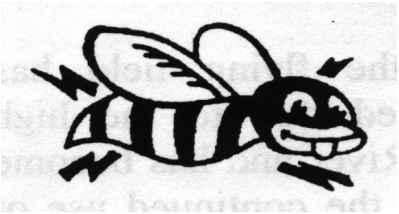
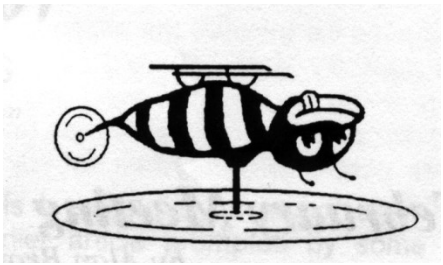


BEES BREEZE



RC BEES of Santa Cruz County, Inc.

AMA Chapter 144

Newsletter December 2016

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Next meeting

Thursday, December 15th, at the EAA building, Aviation Way, Watsonville Airport, 6:30 PM. Note that this will be the annual club dinner, with no formal meeting, per se. Just an evening of holiday cheer enjoyment!

November 17th Meeting

Steve Boracca called the meeting to order at 7:35 p.m. with 21 members in attendance, including new member Kenneth Kirsch. Welcome aboard, Ken!.

Richard Ludt shared the treasurer's report, which was approved unanimously, as were the minutes of the previous meeting, both as reported in the November newsletter.

Old Business:

There were further discussions on the December Holiday dinner. Laurie Trescott is anxious to have news about what food members will be bringing. Please contact her appropriately. She and Allen Ginzburg between them will put out an E-Vite invitation which will contain all the necessary information.

Vice-president Dan Morris reported that having replaced the squeegee in our runway sweeper, it was now appropriate to replace the pole! Dan will get one at Home Depot.

Dan also reminded us about the evening fun-fly, scheduled for Saturday, December 10th, which will be close to a full moon. Starting time should be a little earlier than 5 p.m.

New Business:

Steve Boracca pointed out that strawberries were being planted in one of our adjacent fields, which implies that pickers would be in the field probably starting in February.

Note also that both AMA and RC Bees membership renewals will generally be due by January 1st. *(The appropriate RC Bees form is attached to this newsletter).* Note that the club does not recognize AMA park flyer membership, only full membership. If you can renew your AMA membership to start on the first of the year, it will make things much easier for your hard-working treasurer!

The club has two Apprentice trainers, but we need duplicate transmitters for each one, master and slave. We are also looking for more volunteers to help with training. Any prospective teachers should talk to Steve Boracca.

Annual Officers' election:

The final formal part of the meeting was to elect club officers for the coming year. To no-one's surprise, all former officers were re-elected, as follows.

President: Steve Boracca

Vice-President: Dan Morris

Treasurer: Richard Ludt

Secretary/Editor: Alan Brown

Safety Officers: Laurie Trescott & Jeff Wells

Board of Governors: Allen Ginzburg, George Ribeiro & Laurie Trescott

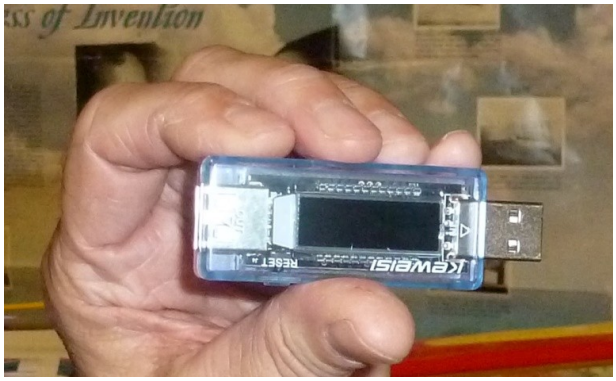
Show and Tell:

Dan Morris brought along his latest model.

This one has the simplifying feature of having one fixed motor for conventional forward flight, and four fixed motors for vertical flight. No reports to date on flight results for this SLT (separate lift-thrust) airplane, but the avionics should be much more straightforward.

Richard Ludt tries out the latest in First Person View equipment, courtesy of Allen Ginzburg, price apparently down to $59 from Bangood.

And here we see the latest in measuring while charging, telling all criteria for all cells – oh, and it's all of $4!



Richard Tacklind brought along a very nicely (as always) finished FlyBaby, also from Bamgood via HobbyKing. The covering is yellow HobbyKing plastic, very inexpensive, with red Rustoleum paint expertly applied. The airplane weighs in at 32 ounces.

Alan Brown showed his latest fun-fly competition airplane, not pictured here, because it was seen and described in last month's "Down by the River" section.

And with that the meeting closed at 8:50 p.m.

Down by the River

With the recent inclement weather, your editor has nothing to report this month regarding field activity. As you will all know, the planned night fun-fly for December 10th has also been cancelled, so how to fill up the rest of the newsletter?

Your editor's airplane designing background has had him look at a number of airplane designs, make models of them, and try to figure out why they finished up the way they did. So here goes.

Flying Flea

This is a ¼ scale model of Henri Mignet's Flying Flea, or Pou du Ciel, his 14th in a series of projected home-built airplanes of the 1930's. And yes, the 66" span model flies nicely with a 0.30-sized motor.

My reason for building it is that I was looking for an airplane which would have an extremely small safe c.g. range in terms of percentage wing chord. The Flying Flea looked like the best example I could find for two reasons. First, very short tail moment arm and second, low aspect ratio wing.

The original airplane (note that it was architect Henri's fourteenth attempt!) had some novel features. First, the wing and tail airfoils were both reflexed to minimize center of pressure shift with angle of attack, second they both had dihedral to help lateral stability (no ailerons), and third, an all-moving wing was on a pivot with a completely fixed tailplane for longitudinal control. The resultant c.g. position had to be, I thought, between 26 and 28% back from the wing leading edge.

Mignet demonstrated the airplane successfully in both England and France, it was featured in the English Popular Mechanics magazine, and a number of people built them in both countries. When the pilot death toll got to be over 50, both countries' governments banned them, and it wasn't until the 1970's that sufficient analysis was done to be sure that safe replicas could be made.

A casual glance at the airplane design will explain why it was such a problem. Firstly, the pilot sits well behind the c.g., so it's diet or die! Secondly, the builder could install any one of a number of possible engines according to what was available, and thirdly and most importantly, the average builder would have no way of measuring where the c.g. was on his particular airplane. Whether Henri knew what he was doing or just lucked out, I don't know, but that's the Flying Flea story as I see it.

Westland-Hill Pterodactyl Mark IV

This is a 1/6 scale model at 88" wingspan of this 1931, very art-deco airplane (check out the diamond-shaped window in the door). I had two reasons for building this airplane, one

because it was extremely unusual for an airplane designed to compete with Taylorcrafts and Piper Cubs as a general aviation airplane, and secondly because a late close friend of mine, John McDonald, who retired from Lockheed to live in Carmel Valley, was the last surviving person to have flown in this one-only-built airplane.

Again, the model flies nicely, once you can get it off the ground in a straight line!

So let's try to figure out what Westland was thinking about!

The first unique feature is that this, to my knowledge, was the first airplane to feature a swing wing. This again comes back to c.g. position. The wing, however, did not swing in flight. As John McDonald told me (he was a sixteen-year-old apprentice when he badgered the chief test pilot into giving him a ride), when he climbed into the adjacent passenger seat (one pilot, two passengers), he was told to set the wing via a lever in the cockpit area to the two-person position. As the people sat well forward of the c.g., the wing had maximum sweep for the pilot alone, and minimum sweep when all three seats were occupied. Can you imagine general aviation pilots doing this correctly every time they flew?

The second interesting feature is the landing gear. You can see that there are two wheels in tandem spaced only three feet apart on the full-scale 44-foot wingspan airplane, or six inches on my model. The front wheel is steerable. Two skids are mounted on outboard fins for lateral balance. They just clear the ground when the airplane is on a runway.

Then note the fairly high thrust-line to accommodate the typical De Havilland 4-cylinder inverted inline engine. This means, in my experience, that thrust management on take-off gets a tad sensitive. Too much thrust and the airplane noses over, and too little and one of the outboard skids digs in and the airplane ground loops.

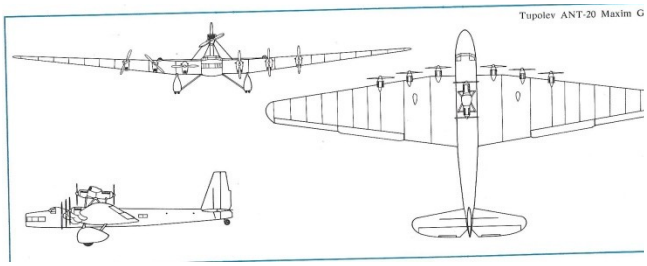
A further complication is that when the airplane was original designed, most airfields were all-grass, and you could always take off directly into the wind. Put this airplane on a tarmac runway with a cross-wind, and it really gets interesting to take-off and land!

On the plus side, John told me that this was a beautiful airplane to fly in (of course he had a very competent pilot!). The noise level was very low with the rear mounted engine, and the view compared to most conventional single-engined airplanes was outstanding. So that must have been what Westland had in mind with this very futuristic airplane for its time. However, only one was built compared to the thousands of Taylorcrafts and Piper Cubs, which really tells the whole story.

Maxim Gorky

In 1933 Josef Stalin, the Russian ruler, decided that Russia should have the largest airplane in the world. He called upon A.N. Tupolev to design and build such an airplane. It was to be completed and flown successfully within two years. Stalin had great incentive programs for people who didn't fulfill his requirements, so no doubt Tupolev was under the gun from the start. In fact the airplane was completed in thirteen months, and flew less than two months later. Tupolev had previously designed the successful all-metal 4-engined bomber ANT-6, which first flew in 1930, a world leader at that time. The new airplane, the ANT-20, was named the Maxim Gorky, after Soviet Russia's great poet. When the airplane was commissioned, new engines had to be developed simultaneously. It was then a fairly general rule in the industry that

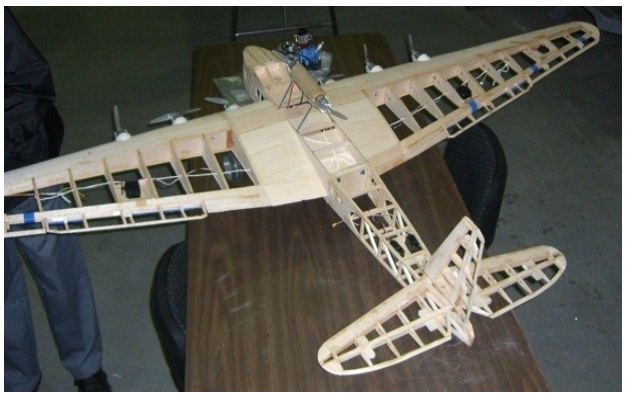
you don't generally develop new airplanes coincidentally with new engines. Nowadays, modern design techniques are more inclined to allow this, but it wasn't the case generally in the 1930's.



The three-view of the airplane gives some clues as to the results of this all-new combination. Tupolev generally designed fairly clean-looking airplanes, but you will notice some things that look like afterthoughts. All of them to my mind have the same source – the engines didn't come up to power expectations.

The airfields available in Russia that were expected to be used for the airplane demonstrations (generally to show the Russian people how great their country was) were limited in length. With the lower power available, what I believe was originally a six-engined design had to be changed to eight engines, with the last two being added in a push-pull arrangement on top of the fuselage. This increased the weight of the airplane, so the flap area had to be increased, which can be seen in the plan view as a chordwise extension. To improve lateral control, the rudder area has also had a last minute increase, I believe. This can be seen on the side view.

Here is my model, which follows these features, in skeleton and flying configuration.



One final last-minute item that poor old Mr. Tupolev had to put up with was that the Russian tire industry couldn't produce the large tires that he needed to support his big airplane, and so while it was designed to have two very large wheels with big wheel spats, the flights were initially made with twin wheels on each side and no spats, as seen on the model. Here is my model in flight. It also forms the heading for our website.

The full-sized airplane unfortunately only lasted for a year. It was demonstrated throughout Russia, often with a couple of Polikarpov fighters alongside to show how big this giant airplane really was. One of the fighter pilots thought it would be neat to do a loop around the wing of the Maxim Gorky while in flight, and either got caught up in the trailing vortex and smashed into the tail, or actually flew into the wing. I've read both stories. Either way, both airplanes and everyone on board were lost.

As an epilog, a second airplane was built about a year later, and it only had the six engines which I think were originally planned. World War II put a stop to any future work in this area.

And that's it for this month. Enjoy!