

Silent Knights Soaring Newsletter

Volume X

Issue No. 1

March 2007

We need articles for future issues of SKSS Soaring News. Please email me with items you would like to contribute. Taylorfiederlein1@hotmail.com Ed.

Editorial corner

Hello Everyone. This is my first attempt at publishing a Newsletter for SKSS. I expect to publish the newsletter quarterly. I have asked some of you for ideas and came up a little short so everyone will just have to put up with my own ideas for what I consider to be appropriate for a newsletter. Since we already have a WEB site with the club minutes and a host of other information, it will be challenging for me to bring you something extra. In this issue, I have three articles, one on motors, batteries and props, another on the "possible" history of aviation and a third on a slope soaring site within 90 minutes of our field. I hope to be able to add to the slope soaring sites in future issues. Anything expressed in these articles is based upon my own research and ideas. I will also include a column called "Random thoughts" and publish just about any random thoughts from anyone in the club as long as they are not inflammatory or personal in nature. However, we all have ideas that we would like to share and the newsletter is the perfect place to do it. We can then discuss these ideas at the field, at Bamboo house, Charlie's garage, over the phone etc. etc.

Motor, Props and Batteries

I had never done a lot of electric flying. Most of my participation in the sport has been flying power and gliders. I flew a number of electrics in Switzerland. However, I just used the parts that came with the plane or were recommended by the guy in the store. The planes flew pretty good but I was using brushed motors and NICAD batteries. Since joining SKSS I found a whole new world of batteries and motors. Bill gave me loads of information and advice and he got me started. Thanks Bill. I built a number of planes but never really got into calculating what motor or prop I was using and why. I also noted several club members changing batteries, props, etc. with mixed results; some catastrophic. Some of you are way ahead of me in knowledge and know this stuff. This article is for those who are having the "mixed" results. I read a number of articles on calculating motor, controller, prop and battery requirements. I am attaching the E-flite instructions below as I found them the most clear and practical. I am putting their recommendations into practice on all of my models. The first is the Supersportster. Here's how it went.

Calculating The Supersportster motor, and prop needs.

I had been flying the Supersportster with an E-Flite 480, 1020 KV motor with a 3 cell 2100 Lipo and an 11x7 prop because it "felt good". Using a power meter, I measured the AMPS at full throttle; 35 AMPS. When I read the motor instructions, at this power draw I am exceeding the maximum burst current draw by 7 AMPS. I am cooking the motor!!!! I did produce 358 watts of power. However, if I calculate my needs in the instructions below, I only need 275 watts of power. The plane weighs 2 lbs 7 oz with motor and battery.. I need to use a smaller prop or one with less pitch or both. The bigger the prop and the greater the pitch, the more thrust will be developed. However, the AMP draw will be greater and the top speed of the airplane will be less. I put on a 10 x 6 prop. That only generated 220 watts of power but

drew only 20 AMPS. According to the instructions with the motor, I can draw 22 AMPS of continuous current or 28 AMPS of maximum burst current for 15 seconds. That would be for take off and in certain maneuvers. So I can try more propellers to get it right where I want it. However, I don't have any other size propellers. I need to order a number of different size props so I can get exactly the power I need without overstressing the motor, the battery or the ESC. I have not discussed the battery yet. That I will tackle in the next edition but we should be able to get 500 cycles from our Lipo batteries if we do not overstress them.

Determine a Model's Power Requirements:

1. Power can be measured in watts. For example: 1 horsepower = 746 watts
2. You determine watts by multiplying 'volts' times 'amps'. Example: 10 volts x 10 amps = 100 watts

$$\text{Volts} \times \text{Amps} = \text{Watts}$$

3. You can determine the power requirements of a model based on the 'Input Watts Per Pound' guidelines found below, using the flying weight of the model (with battery):

- 50-70 watts per pound; Minimum level of power for decent performance, good for lightly loaded slow flyer and park flyer models
- 70-90 watts per pound; Trainer and slow flying scale models
- 90-110 watts per pound; Sport aerobatic and fast flying scale models
- 110-130 watts per pound; Advanced aerobatic and high-speed models
- 130-150 watts per pound; Lightly loaded 3D models and ducted fans
- 150-200+ watts per pound; Unlimited performance 3D models

NOTE: These guidelines were developed based upon the typical parameters of our E-flite motors. These guidelines may vary depending on other motors and factors such as efficiency and prop size.

4. Determine the Input Watts per Pound required to achieve the desired level of performance:

Model: Hangar 9 P-51 Miss America

Estimated Flying Weight w/Battery: 9.0 lbs

Desired Level of Performance: 90-110 (100 average) watts per pound; Fast flying scale model

**9.0 lbs x 100 watts = 900 Input Watts per Pound of power (minimum)
required to achieve the desired performance**

5. Determine a suitable motor based on the model's power requirements. The tips below can help you determine the power capabilities of a particular motor and if it can provide the power your model requires for the desired level of performance:

- Most manufacturers will rate their motors for a range of cell counts, continuous current and maximum burst current.
- In most cases, the input power a motor is capable of handling can be determined by:
Average Voltage (depending on cell count) x Continuous Current = Continuous Input Watts
Average Voltage (depending on cell count) x Max Burst Current = Burst Input Watts

HINT: The typical average voltage under load of a Ni-Cd/Ni-MH cell is 1.0 volt. The typical average voltage under load of a Li-Po cell is 3.3 volts. This means the typical average voltage under load of a 10 cell Ni-MH pack is approximately 10 volts and a 3 cell Li-Po pack is approximately 9.9 volts. Due to variations in the performance of a given battery, the average voltage under load may be higher or lower. These however are good starting points for initial calculations.

Model: Hangar 9 Miss America

Estimated Flying Weight w/Battery: 9.0 lbs

Input Watts Per Pound Required for Desired Performance: 900 (minimum)

Motor: Power 60

Max Continuous Current: 40A *

Max Burst Current: 60A *

Max Cells (Li-Po): 5-7

6 Cells, Continuous Power Capability: 19.8 Volts (6 x 3.3) x 40 Amps = 792 Watts

6 Cells, Max Burst Power Capability: 19.8 Volts (6 x 3.3) x 60 Amps = 1188 Watts

Per this example, the Power 60 motor (when using a 6S Li-Po pack) can handle up to 1188 watts of input power, readily capable of powering the P-51 Miss America with the desired level of performance (requiring 900 watts minimum). You must however be sure that the battery chosen for power can adequately supply the current requirements of the system for the required performance. You must also use proper throttle management and provide adequate cooling for the motor, ESC and battery.

Slope soaring sites

Breezy View Park. Pennsylvania

There is a slope site which is popular with the locals as well as fliers from surrounding states. The site is in Lancaster county near Columbia, PA. It is at Breezy View Park which is part of the Lancaster County Park system. The Lancaster Area Soaring Society worked with the parks system to establish the site for slope flying and includes a stone lane and parking at the site, a grass landing area and outdoor toilet - the last can be quite important. The site overlooks the Susquehanna River with the stacks of Three Mile Island in the distance. It is 220 ft. to the bottom of an 80 degree slope with a nice lift pocket at the junction of north and west faces. A nice west ridge line runs for 1/2 mile to the north making it good for doing turns with large ships. A 60" ship is very comfortable on this slope. It works well with winds from west to north west at 15 mph and up - way up.

To get there - take Route 30 to Columbia, PA. Exit at Columbia and take route 441 north uphill. Near the top of the grade is the entrance to a Little Peoples daycare on the left. Take the left and follow the stone lane back to the parking lot at the slope. The action is usually September through May.

Did Ancient Men Fly Airplanes?

Flight has been the dream of humankind since they watched in awe as birds soared effortlessly through the sky. But, according to accepted history, it wasn't until the 1780s that two Frenchmen achieved lighter-than-air flight when they were lifted into the air in a hot air balloon near Paris. Then powered, heavier-than-air flight became the goal. Although it was theorized that heavier-than-air flight was possible as early as the 13th century, and in the 16th century Leonardo da Vinci designed winged aircraft and a crude kind of helicopter, it wasn't until the Wright brothers made their first successful flights at Kitty Hawk in 1903 that powered flight became a reality.

That's the widely accepted history. Some researchers and a few rogue scientists believe there's evidence to suggest that humans achieved flight earlier in history - much earlier... so early, they say, that the knowledge of this technology has been lost and ancient stories that recount adventures of human flight have been relegated only to myth.

Is it possible that humans developed the technology to fly in early civilizations - or in civilizations that are now lost to history? Let's take a look at what some call the evidence - intriguing artifacts, carvings, inscriptions and legends - that they say point to the true record human of flight.

The Egyptian Airplane

In 1898, a peculiar six-inch wooden object was found in a tomb at Saqqara, Egypt that dated back to about 200 BCE. The object had a body or fuselage, seven-inch wings that curved downward slightly, a fixed rudder and a tail. It looked very much like a modern airplane or glider. But since airplanes had not yet been invented in 1898 (never mind ancient Egypt), it was labeled as a model of a bird and stored away in the basement of the Cairo museum.

The object was rediscovered many years later by Dr. Khalil Messiha, an authority on ancient models. According to Messiha and others who have studied the object, it has characteristics of very advanced aerodynamics, much like modern pusher-gliderng that require very little power to stay aloft. The curved wings are today known as reversedihedral wings, which can attain great amounts of lift. A similar design is employed on the supersonic Concorde aircraft.

Was this just a child's toy? Or was it a scale model of an aircraft the Egyptians planned to build... or did build. If they did build a full-scale version of the aircraft, no evidence exists for it. No full-size airplanes have been found in any pharaoh's tomb to fly him to the land of the dead.

The Carvings at Abydos

Although no airplanes or airplane parts have ever been found from the ruins of ancient Egypt, is there corroborating evidence that they constructed aircraft? Even more controversial than the model airplane are the enigmatic carvings found in the temple of Abydos. by Dr. Ruth Hover. Hover photographed a wall panel which had been revealed when a newer overlaying panel crumbled and fell off. The older panel beneath contained embossed images that resemble modern aircraft as seen in profile.

One bears a striking resemblance to a modern helicopter, while others could be interpreted as aircraft, hovercraft or even flying saucers. When the photos of these carvings surfaced, it was assumed that they had been digitally altered to create a sensational hoax. And indeed some of them had been retouched to more clearly show aircraft-like features. But even unaltered photos seemed to show the very modern-looking figures.

Perhaps looks are deceiving, however. The official take from archaeologists is that the strange carvings are palimpsests - the result of two or more overlapping carvings that combine to look like something else. The "aircraft," they say, are merely combinations of overlapping hieroglyphics.

Central and South American Shuttle

Egypt's isn't the only ancient civilization that has produced puzzling artifacts. A remarkable gold trinket estimated to be at least 1,000 years old - dating perhaps to between 500 and 800 AD - was found in Central America and along coastal areas of South America. If you weren't aware of its age, you might guess that it was a child's model of the Space Shuttle or a delta wing fighter aircraft. When the artifact was discovered, archaeologists called it a zoomorph, or animal-shaped object. It resembles no known flying animal, however. It looks distinctly mechanical with its delta-shaped wings, stabilizer fins and rudder. It even has what looks like a pilot's seat in the right place. Experts in aerodynamics, however, contend that the wings are too far back for the object's center of gravity, and that the nose is not aerodynamically sound.

Whatever this object is supposed to be or represent, its remarkable resemblance to a modern aircraft or spacecraft is uncanny.

Nazca - A Reason to Fly?

Spread over a 37 by 15 mile plateau near Nazca, Peru are huge works of art "drawn" on the ground by people of the Paracas and Nasca cultures. The [figures](#), called geoglyphs, are stylized portraits of a 18 different kinds of birds, a curly-tailed monkey as big as a football field, a killer whale, a 150-foot spider, a lizard, human forms and other strange objects.

Although the civilizations that created the figures flourished between 200 BC and 600 AD, no one knows for certain when the geoglyphs were made... or why. But since they were discovered, archaeologists have wondered by these people would create such monumental works of art that could not be appreciated from the ground. The figures can only be distinguished when viewed from a great height. In fact, they were discovered in recent times only when an explorer noticed them when flying over them in an airplane. Since there are no nearby mountains or other elevated areas nearby from which to look down on the Nazca lines, how were they ever seen?

Because of Nazca's large grids of crisscrossing paths, that seem to go nowhere (some extending as long as six miles), authors such as Erich Von Daniken have suggested (with only this as "evidence") that Nazca is a ancient spaceport. The paths, he contends, are runways for aircraft, and that their pilots and passengers were those privileged to view the large-scale figures.

Less sensationalistic is the suggestion that this ancient civilization constructed hot-air balloons in which to take passengers aloft to view the symbols. In 1974, Julian Nott and Jim Woodman tested this theory by building a balloon made of materials available to the Nazca natives. They constructed a gondola of totora reeds and stitched-together sheets of cotton cloth that they filled with the hot air from wood smoke. Their balloon, dubbed Condor I, quickly rose to over 300 feet, proving that it was at least possible for the South American natives of this region to have achieved lighter-than-air flight long before Europeans did.

The Vaimanika sastra

Although the Chinese are credited with inventing rocketry, some people believe that an ancient text from India describes sophisticated air flight by human pilots. Written by Maharishi Bharadwaja in the 4th century BC (allegedly dictated while he was in a trance), the Vaimanika-sastra seems to talk about piloting some kind of aircraft - a vimana - with some astonishing capabilities.

Sounding like a manual for aerial battle (or instructions to a video game), the text claims to reveal 32 secrets of piloting a vimana, including:

- Goodha - permits the pilot to make his vimana invisible to his enemies.
- Paroksha - enables the pilot to paralyze other vimanas and put them out of action.
- Pralaya - pushes an electrical force through the "five-limbed aerial tube" so that the pilot may "destroy everything as in a cataclysm."
- Taara - provides the pilot with another means of avoiding contact with an enemy or hiding from observers: "By mixing with ethereal force 10 parts of air force, 7 parts of water force, and 16 parts of solar glow, and projecting it by means of the star-faced mirror through the frontal tube of the vimana, the appearance of a star-spangled sky is created."
- Jalada roopa - instructs the pilot in the correct proportions of certain chemicals which will envelop the vimana and give it "the appearance of a cloud."

Was the Vaimanika-sastra simply imaginative writing, rich with symbolism and religious meaning? Or was it a description of ancient yet advanced technology that humankind was not to rediscover until the 20th century?

Random thoughts

For all of you who only fly ARF's try building a kit. Even if you build only one you will gain lots of experience with CA, epoxies, balancing a plane, getting it straight, etc. This will also improve you ability to repair your ARF's.