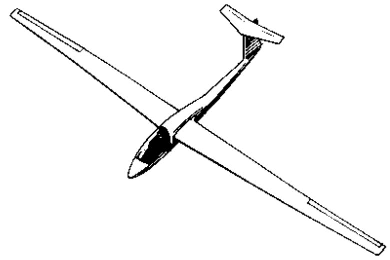
CLARENCE SILENT FLYAIR



QUARTERLY NEWSLETTER OF THE CLARENCE SAILPLANE SOCIETY

SEP-97

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From: Martin R. Timm
Sent: Friday, August 01, 1997 7:06 PM
To: 'Eric Rash'
Subject: FW: [EFLT] Soaring Sp400 record at Rancho San Antonio
Marty

From: Andrew Tickle[SMTP:andrewt@cadence.com]
Sent: Thursday, July 17, 1997 9:58 AM
To: eflight-list@ezonemag.com
Subject: [EFLT] Soaring Sp400 record at Rancho San Antonio

This message brought to you by EFLIGHT!

--- THE PLANE

For soaring I usually fly 3 meter size, but on Sunday I flew my little Speed 400 powered glider (with BEC). It breaks down into pieces that fit into a small box which can be "hidden" in a suitcase or in the car (complete with charger and Tx).

--- THE FLIGHT

Once it was in the air I decided to think of it as a sleek 3 meter contender. And lo and behold that's exactly how it flew! The longest flight of the day, 1hr 5min, beating much larger planes!

--- THE RESULT

Tremendous satisfaction and a curious levitating feeling lasting several days afterwards! All totally out of proportion to the size of the motor.

--- A RATIONAL EXPLANATION

There is a rational explanation of such valiant flights known only to the British. The truth is that small planes, with good reason, are actually much more terrified than their pilots. So high (even irrational) confidence in the plane helps its flight performance more than it has ever been realised outside Britain (where there are no thermals anyway).

--- THE CALIFORNIA EXPLANATION

At Rancho San Antonio, California, the locals insist that there is a simple earthly explanation. The light Sp400 soarers turn so tightly that they can catch and hold tiny thermals while the the 5 pound monsters fly right by.

--- THE FUTURE

Speed 400 soarers actually do everything well except fly fast. So on fairly calm days they are very competitive.

Speed 400's forever...

Andrew - a slow flying Brit in California

*** Visit the E Zone at http://www.ezonemag.com ***
*** For help via autoresponder, email "eflight-help@ezonemag.com"***

From: Lyn Perry, Social Science (S) Faculty
Sent: Thursday, July 17, 1997 7:49 AM
To: jkce@wzrd.com
Subject: It could have been an event

Erik -

Thought this might be something to include in the next Newsletter - Regards, Lyn ------- Forwarded Message Follows -------

From: "Timm, Martin" <MTimm@RICH.COM>
To: 'Lyn Perry' <perryl@sstaff.sunyerie.edu>
Subject: It could have been an event
Date sent: Mon, 14 Jul 1997 15:17:19 -0400

I expected to meet Harold at ECC S. on Sunday to do a little flying. I found half the club there! Tim and son, Jim Roller, Jim Sonemeier, Don C and Jason (with Spirit), Richard Grady, Curt, Harold, and about 2-3 people that I recognized, but don't recall their names.

Windy conditions prevailed, (too windy for the PuddleMaster - in fact, it could have been a slope day), but the Spirit flew fine. I just wasn't timing my landing turn right and couldn't penetrate to get to my landing tape. (If I had put it 30' downwind, I would have had 3 precision landings.) Jason wasn't so lucky. Late in the day his Spirit popped off the line at about 100'. The wind blew it up and over. He was fighting to regain control when one of the trees on the edge of the field decided to make his wing into the 2-piece version. His fuselage was fine and I believe that we gave him enough encouragement to repair the wing. Another person had the elevator reversed on his electric and got shortest flight of the day when he pulled back on the stick and dove into the ground. Only minor damage to his prop was found.

The consensus amongst the "contest fliers" was that we should have no problem holding contests there. In my opinion, we will just have to make sure that the retriever operator is on the ball as the hi-start got tangled in those small trees on the right side of the field several times and I expect that a winch line has equal potential to get tangled.

Marty

* *

Franklyn A. Perry, Jr
Erie Community College - South Campus
Professor
Social Science Department
perryl@sstaff.sunyerie.edu

WHAT DO THERMALS LOOK LIKE?

From Greater Detroit Soaring & Hiking Society Tangled Lines August 1995

(I saw the following on the Internet and immediately sent a message asking for permission to use it. Wayne Angevine, the author graciously granted permission. I think you'll find it interesting.

I've been meaning to write an article on the structure of thermals for sometime, and I finally hammered together something. It's not the last word on the subject, but I hope it's useful. I also hope I've managed to convey some of the complexity of the subject without turning the casual reader off completely. Model sailplane and free flight fliers are interested in the structure of thermals, which provide the energy for their flying. Here is my attempt to describe thermals. I'm an atmospheric physicist working in the boundary layer. This is not a scientific article, but my views based on extensive reading and observations.

The short answer to the question is that thermals are columns of rising air. A longer answer requires what may. seem 1ike digression into boundary layer. Physics. The boundary layer is the layer of air near the earth's surface that is affected by the surface on scales of an hour or so. The sort of boundary layers we're interested in are convective boundary layers, which occur in the daytime over land in weak to moderate wind conditions. There are other sorts, but they don't produce thermals as such. I'll also assume relatively flat and uniform terrain, and at most fair-weather cumulus clouds. Boundary layer physics is a subfield of atmospheric physics or meteorology, but the scales (and therefore the forces) of interest are different. It is easy to become confused if one tries to apply basic large-scale or storm-scale meteorological concepts to the boundary layer.

A convective boundary layer is a few hundred meters to 3 km thick, depending on the amount of incoming solar energy, the amount of moisture in the ground, the larger-scale weather (high or low pressure), the wind speed, and other factors. Call the boundary layer height zi. The bottom of the boundary layer is a *surface layer about 0.1 zi thick, say 100-200 m. The surface layer is heated by contact with the surface. The top of the boundary layer is a temperature inversion (hence zi, inversion height).

So to first order, thermals are columns of warm and therefore buoyant air that rise from the surface layer to the inversion. The spacing between thermals is about 1.5 zi, say 1-2 km. The thermals themselves are somewhat less than half that, say 500-1000 m in diameter. Most thermals span the boundary layer vertically. There is, of course, a distribution of sizes. Between thermals are broad areas of sink. The sink is weaker than the lift because it covers a larger area.

The opposite is true at the top of the boundary layer, but we rarely fly that high.

There are, as always, complications. Sometimes we fly in the surface layer and sometimes in the lower part of the boundary layer. Rising air in the surface layer (the lowest 100-200 m) is in the form of small plumes, themselves a few tens of meters in diameter. These plumes converge near the top of the surface layer to form thermals. The surface layer to boundary layer transition is not sharp, so we often find ourselves flying in either well-organized thermals or disorganized plumes, or some of both. Thermals evolve over time, are influenced by terrain, and are shaped by and move with the wind. Boundary layer thermals form and dissipate with time scales of 10-30 minutes, surface layer plumes faster. This can lead to the apparent phenomenon of "bubbles"" or detached thermals or plumes. Plumes and thermals respond to irregularities in the surface (different amounts of vegetation, houses, and so on) by forming more often in some places than others. Dark ground (if it's not wet!) and sheet-metal roofs are well-known thermal concentrators. If the wind is light, thermals may stay attached to the hot spot. If not, thermals may form repeatedly over the hot spot and drift downwind. Thermals drift with the average wind over their height, so they may travel at a higher speed and in a somewhat different direction than the surface wind. Thermals also tilt if the wind is stronger at higher attitude, the usual case.

Thermals are not uniform, nor do they have sharp edges. The edges interact with the surrounding air, so thermals have a warm, usually fairly smooth core surrounded by turbulent edges. The air around the edges may be in the form of blobs and may be either rising or sinking. This leads to the common idea that thermals are toroidal (donut-shaped). It's probably more accurate to think of thermals as vertical cylinders. Roland Stull (see reference at end) writes.... the best model might be the 'wurst' model...", that is, that thermals look like vertical sausages. Air detrained from the thermal edges is cooled, and cannot be re-circulated into the thermal except at the ground. Vortex rings of the size of thermals are not observed. Stull also writes, "Real thermals are not perfect columns of rising air, but twist and meander horizontally and bifurcate and merge as they rise."

The strength of thermals is controlled by the amount of sunlight and the surface conditions. If the surface is wet or moisture is being emitted by healthy plants, a larger fraction of the incoming heat from the sun will be used to evaporate water than to heat the air. Water vapor does contribute to buoyancy, but less than heat does. These factors probably account for most of the difference between soaring conditions in the western and eastern U.S.

So far I've described the situation in the middle of a day with light wind and high pressure. I wish all contest days were like that! If the wind is stronger, turbulence driven by wind shear (the difference between the winds at one height and another) may interfere with the formation of thermals and the lift will be light and spotty. If the barometric pressure is low, there will likely not be an inversion to define the boundary layer top. This will tend to produce larger thermals that are farther apart, at least until the rain starts!

Do thermals rotate? They do, but not predictably. Even dust devils don't have a preferred direction of rotation (see Stull, p.449). Thermals are too small and too short-lived to be affected by the earth's rotation (Coriolis force) or by the equator/pole thermal gradient. Their rotation is determined by local terrain. Rotational velocity in the core of a typical thermal is small compared to the vertical velocity.

Those who are Interested in following up to topic further can consult the following references. An Introduction to Boundary Layer Meteorology, by Roland Stull (Kluwer), should be in any good University library. The chapter on convective boundary layers is quite readable. A recent paper on imaging of the boundary layer is by Schols and Eloranta, Calculations of Area-Averaged Vertical Profiles of the Horizontal Wind Velocity from Volume-Imaging Lidar Data, in the Journal of Geophysical Research, vol. 97, pp. 18,395-18,407, 1992.

Taken from the "TIDEWATER MODEL SOARING SOCIETY NEWSLETTER" Aprill 1997

AILERON DIFFERENTIAL

By Gordon Jennings
From Baltimore area Soaring Society ~Vews February, 1997
Who Borrowed from The Minnesota R/C Soaring Society Newsletter, Tom Rent, Editor

The goal of adjusting the differential and/or rudder mix is to get the fuselage to fly around the same size turn as the wings. Too little differential/rudder makes the fuselage point out and up, too much and the fuselage points down and in.

The easiest way to judge the excess yaw you get with aileron input is to fly the plane directly overhead and rock the wings. If the fuselage stays straight, you are happy. Tweak freaks can enhance their ability to see the yaw by attaching a couple of feet of cassette tape to the bottom of the fuselage aft of the towhook. The tape will line up with the air and show how much the fuselage doesn't.

The speed that you do all of this checking at depends on what you want to do with your airplane. If you want it to be friendly for thermaling, set things up at the slowest possible airspeed. If you want nice aerobatics, do your tweaking at high speed.

In terms of tweaking the rudder mix vs tweaking the differential, I'm sure that someone who understands these things (and several who don't) will provide highly technical answers to this question. Here's how I do it:

I tweak the differential for decent axial rolls at "medium fast" speeds. I do this while in the "speed" (or reflex, etc.) mode offered by the TX. In this mode I have the rudder mix set to some small value (say 1/2 of the mix value anticipated for coordinated turns at low speed.

I then switch out of the speed mode and fly slowly. The rudder mix is adjusted for nice rolls and turns at thermal speed. If too much rudder mix is required (more than 75 o of total travel) to get the turns.

Taken from the “TIDEWATER MODEL SOARING SOCIETY NEWSLETTER” Aprill 1997

From: Lyn Perry, Social Science (S) Faculty
Sent: Tuesday, September 16, 1997 7:10 AM
To: Erik A. Rash
Subject: Electric Fun Fly Report

Erik;
Here's the write-up on this year's EFF, just concluded last Saturday, for the newsletter.

1997 Electric Fun Fly

This year's 11th annual had to be postponed a week due to a high wind forecast (which unfortunately came true: 15-30 mph stuff blew through, making flying impossible). Anyhow, we reassembled a week later at ECC-South Campus under mostly gray skies, 65 degrees and a 10-15 mph west wind to see what we could do electrically.

Thirteen pilots registered 20 electrics of all shapes and sizes, from a Speed 400 pylon racer to two multi-engined beauties. After the obligatory coffee and doughnuts, picture-taking and flying commenced with Dave Millikan's 12-engined Dornier DO-X replica attempting two flights. Dave was using Radio Shack motors with one six-cell pack, and the plane seemed to be a bit underpowered; servo jitters led Dave to pack it up for the day.

Most of the electric sailplanes were Spectras, and several of these launched to find lift for the longest flight trophy; Roman (Walter) Paryz III had a 16-minute flight, and I came up with 21 and change. Tim Krystaf did 18 with his ship, and Harold Becker put in a creditable 16-minute flight, but lift was clearly limited. We took a break and watched Bill Hauth fly his Speed 400 Rocket in a spectacular flight which finished in an unrecoverable spin at the other end of the field. Roman had gone up again with his Spectra, and, with coaching from Dr. Jim and a 2000 mah seven-cell pack, managed 29:10 for the Longest Flight award. Marty Timm put his Puddlemaster up, then he and John Tracy proceeded to thermal John's Futaba Professor (Cessna lookalike ARF) for five minutes!

Wayne Jeffries launched his four-engined foam Dash-7, and we all enjoyed the sound of 4 motors and the extremely scale appearance of this plane in the air; the Pilot's Choice plaque went to Wayne, with Bill Hauth's Limit placing second.

We had a good crop of newcomers this time: John Wisniewski, with half a mid-summer lesson, soloed his Spectra twice, Bill Wilcox put his in the air for the first flights with some help from Don, and high-schooler Jay Cole got some stick time on my Lanzo Bomber.

Jim Roller laid out a winch, two high-starts appeared, and non-powered planes flew as well. We had lots of spectators, lots of fun, and we even made a small profit; what more could we ask?

Builder’s Hint

by Martin R. Timm

Lately, I've been noticing more and more planes sporting "Sky Sheen", a strip of reflective metalized tape that is placed on the leading edges of the wing. On sunny days, a plane equipped with this tape becomes highly visible, because the tape catches the sun's rays and flashes brilliantly. You can get this tape through *Northeast Sailplane Products* at $2.50 for a 4 foot roll (enough for 1 plane). A better bargain, however, would be to go to your local auto parts store (I went to *Parts America*) and get the same thing in a 25 foot roll (enough for 3-5 planes) for $4.50.

Building the DAW

Kawafoami Ki61

by Martin R. Timm

First, you might wonder, "Why a foamie?" Well, after having crashed my hotter-than-hot Electrostreak, I decided that I needed some serious training time on an aileron model that's fast and maneuverable. What better place to train than on the soaring slope, where I can fly for long periods of time without having to recharge batteries. What better plane than a foamie that will allow me to try things, screw up, then throw the plane back in the air without a long re-build.

So, what's a *Kawafoami Ki61*? It's a 48" wingspan PSS[1] plane made almost entirely of EPP[2] foam. It is, according to NE Sailplane and Dave's Aircraft Works, nearly indestructible. (I need that right now!) Supposedly, this plane can survive a crash, and be tossed right back into the air. It is so indestructible, that it can be used for "slope combat". That is, if several people fly this type of plane at once, they can attempt to knock each other out of the sky to see who can stay up the longest. CSS doesn't yet have enough "combat" planes to do this, but you've got to start somewhere. The estimates for building one of these planes ranges from 10 to 30 hours. What follows is a "diary" of events that occurred during the building of the plane. (Times are very approximate and do not include "drying" time.)

Hour 0: Open the box. Not many parts. This should be a snap. Two foam wings, a foam fuselage, wood spars and ailerons, and corrugated plastic tailfeathers. (Plus some hardware). The instructions say to install full-size servos and a large battery. They also say that the glue of choice is "Household Goop", a kind of acetic-acid-free silicone (this is going to be different). Also, the radio gear is one of the first things to be installed. OK, credit card ready? I owe… I owe… It's off to Field's we go!

Hour 1: Glue the spars and hardwood trailing edge stiffeners to the foam wing. A quick trip to Holland Hardware is needed to get the "Goop" (Holland Hardware has everything). Hold everything together with rubber bands until the "Goop" cures (24 hours). Twenty-four hours later, look at my handiwork. Oh-oh! The rubber bands have dented the foam at the leading edge of the wing. (Doh!) I should have put some scrap balsa between the wing and the rubber band. Oh-well, I can fill the dents in easily enough. Oh-no. The Goop on the trailing edge dripped out and bonded the wing to some newspaper. (Double Doh!) Next time, remember the waxed paper.

Hour 2-4: Time to cut holes in the fuse for the radio components. The battery, receiver, and servos get wrapped with masking tape and glued into their respective cavities. Well, that sort of makes sense. After all, I can't screw a servo into foam and expect it to stay. At least I don't have to wrap the radio with foam, the whole fuselage is, after all, foam. Full size servos are recommended, but if adding rudder control, the rudder servo will sit where the fuselage gets rounded. Full-size may take up too much space. Oh well, back to Field's to buy a mini-servo. (I will use the left-over full-size servo to make a dual-servo wing.) The instructions suggest not bothering with a receiver switch, opting instead for just leaving an access hole so the battery connector can be plugged in at will. I prefer a switch and install one on the top of the fuselage. The instructions also say to insert the servos with the output shaft toward the rear of the airplane. I think that I will reverse this so that I have more room to work with when connecting the pushrods. Plastic pushrods are seated neatly in a slot melted in the side of the fuselage using a 75W soldering iron (lots of ventilation needed here). Cover components with scrap foam and let set.

Hour 5: Shape the ailerons by chamfering their leading edges 45 degrees. Round the wingtips to a scale-like appearance using 100 grit sandpaper. (Note, the instructions forget to tell you to do this, but this seems like the right place to do it.) Sand the root edges of the wings slightly to allow for a 3" dihedral and glue (more "Goop" - back to the hardware store) together. Dig out some foam behind the spars and epoxy (there's something I know) the dihedral brace in. Let set up.

Hour 6: While the wing sets up, its time to shape the fuselage. As delivered, it's pretty much a rectangular block of foam, with only the profile of the plane cut out. More 100 grit sandpaper makes short work of the square edges. Hey… this is actually starting to look like a plane!

Hour 7-8: Time to tape almost everything with strapping tape (the kind with the filaments). This is what gives the foam its strength in an impact. The foam needs to be sprayed with *3M Super 77* spray adhesive to get the tape to stick properly. Just follow the directions here. Before taping the wing, the aileron servos should be installed.

Hour 9: The fin/rudder and stab/elevator are pre-cut sheets of corrugated plastic. To get the rudder and elevator so they move, just cut the webbing on one side between corrugations. Be sure to remove about 1/8" of material so the control surfaces can swing freely.

Hour 10-11 (or more depending on amount of detail): After taping is complete, the whole plane can be covered with Ultracote. This is my first experience with this material. It works pretty good, but when covering the tape, it's tough to get a really smooth appearance. Oh well, as long as it flies good, who cares. If you add lots of stripes and canopy detail, it draws the eye from the wrinkles. Glue the covering to the tail-feathers with the spray adhesive. It really works. No need to cover the edge corrugations.

Hour 12-13: Tape the Ailerons to the wings using standard hinge tape. Install control horns and connect pushrods to wing servos. The directions show the aileron servos being perpendicular to the spar. The problem with this is that the ailerons are at a slight angle. As such, simple clevises might bind up at the ends of the throws. Having followed the directions, I will use a ball-and-socket linkage, but this could be avoided by installing the servos perpendicular to the ailerons, not the spars.

Hour 14: Glue the wing to the fuselage (yes, glue it) and the tail-feathers to the fuselage. Be careful to not use too much glue, or it will squish out and make a mess on the wings (and its a pain to remove after it has dried… I know.)

Hour 15-16: After the glue has dried, hook up the tail surfaces to the servos and cover the servos with a small patch of material. In retrospect, I think that mini or micro servos would fit in the fuselage better than full-size. Balance the plane by digging a hole in the bottom of the nose and add weight (about 3oz for me) then cover the hole.

How does it fly? I'll let you know as soon as we get a brisk North-West wind.

[1]PSS (Power Slope Scale) planes are usually semi-scale representations of "power" planes without the motor/propeller intended to be flown at slope-soaring sites.
[2]EPP (Expanded PolyPropylene) foam is different from other foams. It is a kind of dense, semi-rigid, semi-rubbery, foam that is easily cut and even sanded.

From: William C. Hays
Sent: Tuesday, August 12, 1997 4:31 PM
To: jkce@wzrd.com
Subject: Items for SALE!!

I have the following items for sale:

<u>*KITS*</u>: All kits are Brand New condition..never started!

Craftair........Viking Mark II............... $50.00
Bob Martin......SR-7......................... $60.00
Dodgson.........Lovesong.....................$100.00
Dodgson.........Camano....................... $80.00
Dodgson.........Pivit (wing kit only)..... $20.00
................Meteor Body (fiberglass)..... $20.00

<u>*PLANES*</u>
14ft. COMET with Kraft radio and Thermal Sniffer......... $200.00
Slightly used Windsong ready for re-covering............ $25.00
<u>*RADIO:*</u>
Brand new ACE MP8000 on channel 24 2-stick 2 flight packs... also includes a hardcase...never flown! $450.00

CALL Willie Hays
688-9429...After 6:pm

submissions