

Silent Knights Soaring News

Editors Note. Thanks to all who made comments or submitted something to me. Remember, this is your Newsletter so let me know what you want to read about. Send me an email at robertB578@aol.com or call me at (302) 376-7517. Bob Bickerton

President's Corner

“Well, it's spring and a young man's fancy turns to.....soaring of course. It's warming up and the field is drying out. More and more thermals are coming through. It really feels like the season has started. It's daylight savings time, so evening flying will start soon. The club planes are flyable now. Many thanks to Bill J, Bill G. and Bob M. I've flown them both and they work great. If you're new to soaring and need some stick time, there's a buddy box available to get some one on one coaching with one of our club planes.

We've been talking about it for a couple of months now, it's time to take stock of our batteries. If you have a battery charger with at least 10 amp capacity we may need it for a couple of days. The plan is to clean and charge all the batteries to check their capacity. The more chargers we have, the faster it will go. So if you have a charger and can spare it for a couple of days, please let me know. At the next meeting I hope to coordinate the effort, which will also include cleaning up all the battery cables and connectors. I'll let you know about the date soon, but it should be in the next couple of weeks.

That's all for now, I'll see you at the field.” Terry Lisansky

Sailplanes and

Spring has sprung, the grass is riz, I wonder where the posies is? Hey guys, it was a long winter but spring is upon us and it's time to fly.

Remembering the long winter is reminiscing a bit and Bill Jordan did just that - he sent the following that I want to share with you.

Gunning Bedford Revisited – by Bill Jordan. “Gunning Bedford is the name of a middle school located outside of Delaware City along the C&D canal. It used to be the flying site for SKSS.

To the people that have become SKSS members since we moved to Big Pond Field, the term ‘Gunning Bedford’ is probably not significant. To the ‘old-timers’, it will conjure up memories of flying with hi-starts, wimpy winches (compared to what we have now), no retrievers, losing planes in the cornfield, or on the school roof, or in a tree, or in the brambles at the north end. (I've done all of the above.) A 100-inch sailpane was state-of-the-art, and fiberglass fuses and carbon fiber were still exotic stuff. Most of us were still flying 2M Gentle Ladies, Wanderers, Risers, etc. We had winches, but our means of transporting them with their attendant batteries was with my grandson's little red wagon. When the wind was anywhere

Silent Knights Soaring Society

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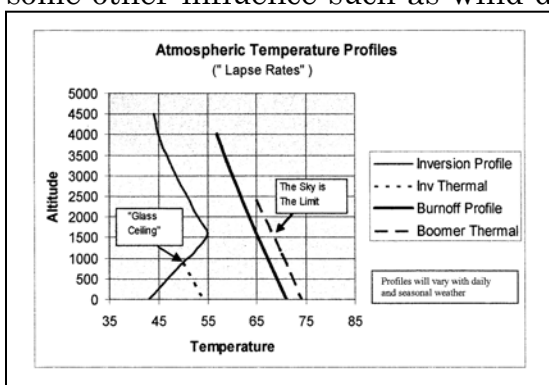
from the south, southeast or southwest, it was a long and laborious haul from where we parked our cars out to the north end of the field. There was no golf cart, so setting up the winch meant the long walk from the launch area down to the opposite end of the field to set up the turnaround, and then walking back. There was no retriever until the last couple of years, so it meant a long walk from the launch area to retrieve the 'chute' after a launch, and the walk back. We got a lot of healthy exercise in those days.

Jim Faassen visited Gunning Bedford a while back, and reported that the flying site was occupied by several dirt mounds, and no longer available. Fortunately, that apparently was a temporary situation associated with the construction of another school on what used to be the cornfield on the east side of the field. I revisited the site just recently, and to my surprise, the flying field as we knew it is still intact. There have been some changes in the parking areas, and the former cornfield is now a huge elementary school. But the north-south flying field is still open.

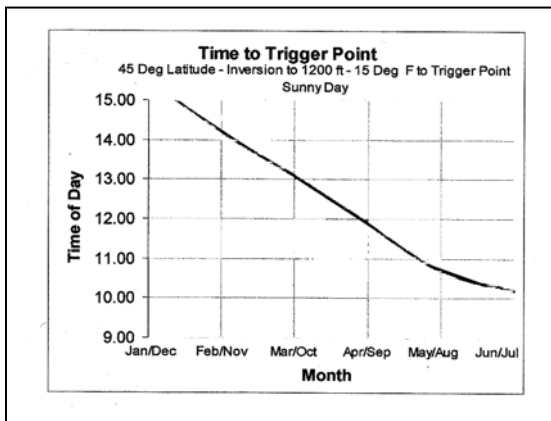
It's not likely we'll ever go back to Bedford, since it's doubtful we would be able to secure permission to use the premises with two schools there. But it was a trip down memory lane to see the place where I started flying. Ah yes, them were the days....". Thanks, Bill!

'Glider guiders' love to find a thermal, that elusive column of rising air that allows us to stay aloft and soar with the buzzards. I've been in some real thermals and enjoyed every minute of it but, usually, it's because I stumbled into one. I've learned that some glider pilots understand our atmosphere better than me and readily find thermals. One of those guys is Jim Faassen - read on and find out about thermals and temperature inversions.

Those Pesky Inversions – by Jim Faassen "Sailplane pilots are familiar with the fate which often attends early morning flights. The plane comes off the launch and doesn't want to go much higher. Maybe it even comes down a bit, and finds a level where it stays for awhile. Under such circumstances, some say the air is "buoyant". Another explanation is that the plane is in a thermal, but there is an inversion in the air temperature. In an inversion the air temperature increases with altitude to a certain height, instead of decreasing, as is the normal case. *Inversions typically form at night*, when the ground cools. They can extend several hundred feet in altitude, or even a few thousand feet. But, when they exist they limit the height which thermals can reach. A thermal will rise only until its temperature equals the temperature of the surrounding bulk air, or until some other influence such as wind destroys it. In an inversion, this limiting temperature may occur at a fairly low altitude. *Inversions usually burn off during the day's heating*. During sunny days this occurs more rapidly



than during cloudy days. On sunny days, if the temperature profile (lapse rate) of the inversion is known, and the latitude is known, the time required to burn off an inversion can be calculated with a fair degree of accuracy. This point of burn-off is called the “trigger point”. When the trigger point is reached, thermal height is no longer limited by the inversion, and real “boomers” can form. The first chart below shows how the “glass ceiling” of an inversion can limit the altitude of a thermal. It also shows a typical temperature profile after the inversion is burned off, and the absence of a ceiling for the thermal. (The thermal is initially warmer than the bulk air around it, and cools as it expands in the reduced pressure of higher altitudes.) *Burn-off to a trigger point is obviously dependent on the season.* Seasonal effects are shown on the second chart below, for a specific inversion rising to 1200 feet. In May or August the time of day we can expect an inversion to be



burned off to the trigger point is later than it is in June or July. This example assumes a latitude of 45 degrees. Although the trigger point will vary with different inversions, the chart shows with some accuracy for a specific case what we have already observed qualitatively as a result of flying experience. *At some airports* the actual lapse rates are measured daily in the early morning, and when this info is available the trigger point for

the day can be calculated with surprising accuracy. The data used in constructing this chart are taken from a book “Understanding the Sky” by Dennis Pagen. More details on temperature profiles (lapse rates) are available, along with a host of additional information on the behavior of the atmosphere, in this book. A copy of the book is available for loan to club members, with the request that it be returned to the Birdhouse for the next interested member to pick up. It is in the circulation loop.” Thanks very much, Jim!

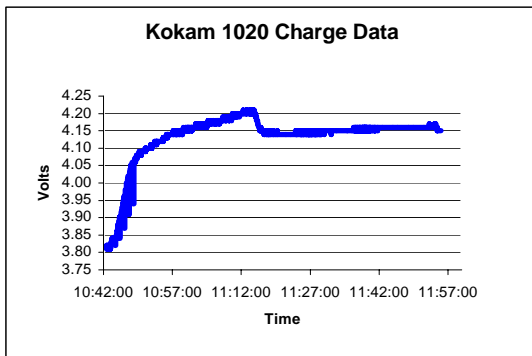
ELECTRIC

Zagi FiXX – mini review. Last April I ordered a Zagi FiXX and this February, Middletown Electronics and Hobbies finally received a

Shipment, so I rushed to pick up mine. The MSRP on the kit is \$150 but Middletown Hobbies sells them discounted. So what do you get for your \$100 plus bucks? You get a right and left wing panel molded of Z Foam™ (much more closed cell than Styrofoam or EPP) that are covered with a nice smooth urethane finish (no more packaging tape) including pre-hinged



elevens, a 5:1 ball bearing gear box and GWS EPU 3 electric motor with 8x4.3 prop, a 5 amp electronic speed control, pre-made pushrods, control horns, an 8 cell 370 mAh NiMH battery pack, a bottle of CA glue, a length of vinyl tape, a sheet of stick on decals, and an illustrated assembly booklet. You need to add two HS55 micro servos (servo slots are made for these) and a micro receiver to complete the kit. It's available in any color as long as it's white on top and red on the bottom. I put mine together as shown in the directions in about 2 hours. I needed to remove some flashing and found that sharp scissors and a razor blade work; sanding didn't work for me. The wing panels apparently still have mold release on them that has to be removed with rubbing alcohol before applying a couple of tape strips (use ONLY 70% isopropyl rubbing alcohol not the 91%, the 91% rubbing alcohol does attack the finish). Although mentioned in the instructions, I'll emphasize -- do not try to remove tape once you've put it in place. To do so will likely pull the finish off. Wonder how I know? The instructions mention that the motor/battery system is a matched system and advise one not to use other (higher capacity) batteries or risk burning out the motor in short time. From my experience with other small GWS motors on 8 cells I think I'll heed the advice. Over all, I think the little flying wing assembles easily, looks nice (see picture) and should be fun. I've not flown mine yet (there's 2 feet of snow everywhere as I write this) but have reports that it is a great little flyer but not a beginner's airplane.



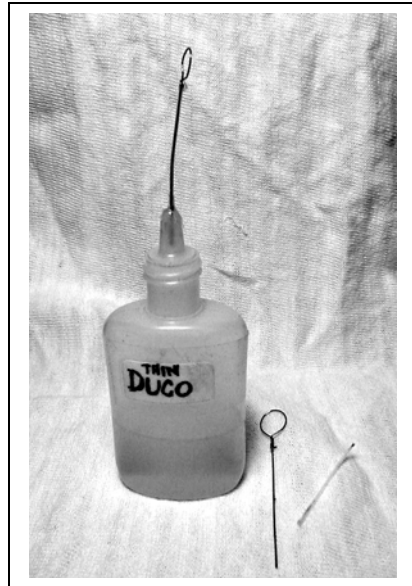
Lithium Polymer battery update! In the last issue I mentioned that high rate discharge LiPo's were rumored to be in the offing. Well, they are a reality! FMA Direct have announced a 600 mAh battery that can take 10C discharge rates and Thunderpower™ Lithium polymer batteries (www.flightenergy.com) report that theirs can take even

more. They were used in a number of airplanes flown at the San Diego Mid Winter Electrics, including Logo 8 heli's and Gary Wright's E3D. Cell packs consisted of 3, 1950 mAh cells connected in series (~11 volts) with 4 of these connected in parallel (7800 mAh). Motor currents were in the 30 to 40 ampere range. Gary Wright flew his E3D with a Hacker C40 brushless motor, doing continual aerobatics for over 30 minutes on one charge. The pack weighed less than his usual 10 cell 1700 mAh pack. One of the downsides is that each cell in the 12-cell pack costs \$18.00 for a total of \$216.00. Another downside is the long charge times mentioned in the last issue. My new Triton™ charger with a maximum LiPo charge rate of 2.5 amps would take over three hours to charge a 7800 mA pack. Personal experience tells me it could even be longer! Look at the graph, which shows the 1st charge of a brand new Kokam 1020 mAh cell. These cells are shipped with a 50% charge (mine were at 3.81 volts before charge). The data show that the Triton charger works great with lithium polymer batteries and that it took an hour and 15 minutes (10:42 until 11:57, the x-axis is actual clock time) to finish the charge, for a battery that's already 50% charged. In my opinion, that makes field charging of LiPo's rather impractical. That said, my hope is that, because they offer high energy density, reduced weight and, very low self-discharge, I can charge LiPo's at home then get several flights at the field without recharge.

How To! Triple Gluing!

This issues' 'How to' is probably of more interest to guys like me who still like to build stick and tissue models. Common sense needs to be applied when using what is described. You wouldn't try to glue 2X4's together with model airplane cement and the technique isn't applicable when building large airplanes – model cement just isn't strong enough in those applications but for 'stick and tissue' models it's a great technique. Building light, but structurally strong, models is a goal we all strive for and it's particularly important with smaller models. Lightness (low weight) results from the combination of a number of things: proper structural design; appropriate wood selection; careful cutting/sanding; and, appropriate glue application. It's the latter that I want to talk about but first a little background. Club member

Jack Alderson is a craftsman when working with wood (not only model airplanes but furniture and exquisite bird carvings too, they are works of art) and he had begun construction of a Herr StarLite small electric model. Knowing my passion for small electric airplanes, Jack showed up at my shop one day with the wing and tail feathers fully built and the fuselage parts in the box and with the pronouncement 'Here, you should finish this!'. With little left to do, I built the fuselage and covered everything with Esaki Japanese tissue as advised on the plans. Two coats of 50/50 thinned nitrate dope finished it and I put the airframe on my scale to weigh it. I was amazed, it only weighed 1.8 ounces. The StarLite has a 3 foot wingspan!! Obviously, the design and wood selection had been appropriate but glue application had also been appropriate to get the model that light. When looking at the constructed wings and tail feathers delivered by Jack, I had been impressed; all joints were neat and precise AND you could not see any glue on the surfaces of any joint! Aha, I thought, Jack used that triple gluing technique he taught me a couple of years ago. Indeed he had, and that contributed to the light weight. And just what is triple gluing?? Here's the skinny! Get yourself some Ambroid or Duco Household cement, both are cellulose acetate based and both work well. Also get a can of Acetone from Lowes or Home Depot. Then find a polyethylene bottle (the kind that CA comes in) that has only a small orifice for dispensing whatever was in the bottle and a piece of 0.015" ID Teflon tubing about 2 inches long. Put some cement (Ambroid or Duco) in the bottle and add three times that amount of acetone so you have a 3 part acetone, 1 part glue mixture. Shake until all the glue is dissolved in the acetone – it will be about the consistency of milk. Flare one end of the Teflon tubing with a heated needle so that when inserted through the orifice of the cap it won't pull out (a tiny drop of hot melt glue will help hold it). A piece of .015 music wire with a loop on the end makes a nice stopper when inserted through the Teflon tubing (see picture). Now, let's triple glue a typical wing panel. Pin the leading and trailing edges down on waxed paper over the plan (bottom spar, too, if it has one). Lay the ribs out where they will be glued in. Starting at one end (mono gluing) squeeze a little glue mixture onto each joint location and onto the leading and trailing edge of the rib, set it aside and work your way to the other end, rib by rib. With the glue being dispensed through a small tubing it's hard to get too much on but use care. When you've completed the process, start all over and do it again (double gluing); by the time you get to the last joint, the first one will have dried and the acetone will have evaporated. Now let's finish (triple gluing) -



go to where you started and put some glue on the leading edge, trailing edge, and the rib leading and trailing edges and insert the rib in position; the glue will not penetrate as quickly because of the prior two applications so you have a little time. If the joint is a good one, friction will hold it in place but pin it if you must. Repeat for all the ribs. Be aware at this point! If you decide you need a little more glue on one of those joints, the application of more glue can actually soften (dissolve) what you have already done so be careful. Let everything set for 15 minutes or so then just look at your gorgeous gluing job. The ribs will be glued firmly in place and you won't be able to see the glue. You have a structurally strong and light glue joint. I like it, try it, you might too!