THE LEADING EDGE

The Newsletter of the M.I.T. Soaring Association, Inc.

June 1997

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Thermal index reports on the net

Andrew Watson

Although there is plenty of aviation weather data available in the USA, little of it is soaring-specific. In particular, it is hard to find forecasts of thermal strength and maximum height. However, as Russ Marter reminded the club in an email message this month, Kevin Ford at the University of Texas at Austin has made a daily thermal index forecast available via email and the web.

The thermal index at a given altitude is the difference between the actual air temperature and the temperature that a parcel of air would have if it started at the surface and rose adiabatically (as it does in a thermal) to that altitude. Negative values mean that the air parcel is warmer than its surroundings, and so will continue to rise. The altitude where the TI reaches zero is roughly the maximum height of convection for the day, although convection near the top will be weak, and a glider probably won't climb much past the TI = -3 level. Because of continuous mixing in the atmosphere, the actual temperature difference between the rising air and its surroundings is usually not more than 0.1 C, so the TI value is less precise in predicting thermal strength.

Kevin's thermal index is automatically generated from upper air soundings made twice daily by radiosonde observations (RAOBs) at midday and midnight GMT at some 150 locations throughout North America. Radiosondes are balloon-borne instruments that transmit continuous temperature, humidity, and pressure measurements as they ascend to around 70,000 feet, where the balloons burst and the instruments parachute back down. Tracking the balloons reveals the wind speed and direction at various levels. The thermal index program takes the raw temperature, pressure, and dew point data and generates the thermal index for each RAOB location. This index can then be applied to forecast surface temperatures at a wider range of locations, or to user-supplied surface temperatures.

During the summer the 12Z (midday GMT) soundings take place at 8AM local time, and the data usually becomes available somewhere between 0845 and 0930 EDT. The most appropriate (and closest) sounding station for Sterling is probably Albany, NY, which is 105 miles to the west. There are two ways of getting the report: via email or a web page. To specify which soundings and forecast temperatures to use, call up the web page at http://csrp.tamu.edu/soar/for.html.

You need to supply the type of report (choose "complete"), RAOB station (choose "Albany"), surface temperature (or a city whose forecast temperature to use, choose "Boston"), and altitude limit (choose 18,000 feet—be optimistic!). Once you've set these up, you can bookmark the resulting page, and every time you reload it you'll get the latest TI forecast for your selection.

The report gives the thermal index at 500 foot intervals for the forecast surface temperatures, and also the "trigger temperature" for each height—that is the minimum surface temperature needed to give a TI of -3 at that altitude. Also included are the estimated cloudbase, the wind speed and direction at various altitudes, and the raw RAOB data.

You can also order exactly the same report via email. Sending this message generates the same report as the procedure described above:

To: soar@csrp.tamu.edu
Subject: TI.REPORT

ReturnAddress: ⟨your-email-address-here⟩
UpperStation: ALB
MaxAltitude: 18000
SurfaceStation: BOS

Finally, the acid test: are the forecasts accurate? On the two flying days at the end of May this year when I did the comparison, the cloudbase and maximum thermal height forecast from the Albany soundings were spot on. If you're not already on the field and checking out a glider for your silver height or 300K by 9AM, it is worth checking Kevin's thermal index to see if you should be!

The president speaks

Phil Gaisford

The soaring season: The soaring season is open. After a somewhat delayed start, many of us have good reason to be pleased with the amount of soaring done from Sterling so far this year. Two flights exceeding 560K, as well as many 300K efforts are known to me, plus wave climbs to 15,000 feet. Congratulations are due to Steve Glow, who in addition to serving as club treasurer, completed the height gain and duration parts of the FAI silver badge on Memorial Day. If your season is off to a slow start this year, let me encourage you to get to the airport whilst the conditions are at their best.

On the soaring club: Although many of you will have heard this before, I want to remind everyone that the organization and functioning of the club depends entirely on the efforts of enthusiastic volunteers. Not the least amongst these are our long-suffering instructors where, I am concerned to note, the emphasis of late has been shifting more toward the "suffering" end of the scale. Your board of directors is doing what it can to assist by encouraging a number of candidates as they work to attain their CFIG certificates. We can all do our part by being properly appreciative of the role played by all our volunteers.

On the subject of volunteerism, Jim Emken still has vacant ship captain slots to fill. Being a ship captain means being responsible for monitoring the condition of one of the club ships, and instigating corrective action as it becomes necessary. Contact Jim if you can make a contribution in this area.

Upcoming events: We have entered the discussion stage for organizing expeditions later in the season. Steve Glow and Carl Johnson are taking a Blanik to the Region 1 contest. We also want to mount an expedition to a wave soaring site, and Gorham, NH and Sugarbush, VT are the likely candidate sites. If you are interested in joining any of these activities, contact Carl ASAP.

Maintenance update: Jim Emken says the 1-34, L33, and 117BB have been annualed, and the 1-26 is flying again after its repainting. There is a new white board in the MITSA office. It lists each club aircraft, the expiration date of its annual, its ship captain, its flight status, and a remarks column. Please check the status for each club aircraft on the white board before starting an operation. If you ground an aircraft for any reason, place a grounded sign in the aircraft, update the white board in the MITSA office, and notify the director of maintenance.

Parachute jumping: John Wren reports that there is now parachute activity at the Orange airport.

L33 page: Vitek Siroky (viteks@aol.com) reports that the L33 Owners Unofficial Association Page is up again at http://www.nwinternet.com/ blanikam/l33assoc/l33.htm.

Minutes of the Board of Directors

Phil Gaisford

These minutes have been heavily edited for publication in the newsletter. —Editor

May 29, 1997

Maintenance: The experience of Boston Gliders indicates that towplane climb performance could be improved by changing the prop pitch. Jim Emken will look into this further. • Two of the clubs parachutes have been repacked, but the packer would not service the third due to its age. It was decided to dispose of the latter. • Bruce Easom is looking for material suitable for fabricating canopy covers for the L23s. • Thanks to a lot of organizing effort by Jim Emken, ferrying of aircraft to Yankee Aviation in Plymouth for annual inspection has proceeded smoothly and in a timely fashion. • Jim Emken is still looking for volunteers for ship captains for two of the club ships. • The L33 required some repair in the area where the tail dolly fits. Although the cause is unclear, in the future, members should be careful when fitting the dolly. • It has come to light that MITSA owns a scale suitable for the purpose of weighing an aircraft. • A new aircraft maintenance operation is expected to open at Sterling shortly. • Replacement air vent scoops have been ordered for the L23. • Two electric varios have been delivered and await installation in the L23s. Carl Johnson will oversee the installation in the L33.

Instruction: Carl Johnson and Bruce Easom are preparing for the instructor written exam. Walt Hollister is understood to be also pursuing a CFIG certificate. • A long overdue update to the club manual—the venerable "blue book"—was discussed, and Bruce Easom and Joe Kwasnik will cooperate on the issue.

Administration: An operating "budget" and projections are being made for the coming year. They are not yet complete, but Steve Glow and Al Gold to report at next meeting. • Concerning the MITSA club house at Sterling airport, the airport continues to be supportive, but Joe Kwasnik has been short of time. Carl Johnson volunteered to help on the project.

Other: The following possible future projects were discussed: the Region 1 contest at Springfield; an expedition to Gorham; an expedition to Sugarbush; and USAF physiological training (Carl gave an interesting description of his simulated decompression at 30,000 feet).

New badges: Steve Glow did his silver altitude and duration legs in the 1-34 at Sterling on Memorial Day. Jim Emken did his 300K gold distance in his Janus at Keystone. On that trip to Keystone, Jim took the whole week off and flew five out of nine days. He did a total of 42 hours, he did his 300K gold distance on a thermal day, and he went on three ridge flights totally 2,060K with his partner who was there part of the time.

A weekend at Keystone Gliderport

Carl Johnson

I have always been a loyal MITSA pilot. Since 1979, I have flown only MITSA gliders, meaning only Schweizers and Blaniks. I'm not complaining—I've had some wonderful flights in these ships. I completed my Silver C in the club 1-26 in 1983 (upwind from Mansfield to Sterling), and have had some absolutely fantastic flights in Sugarbush wave. I hope to complete my diamond goal in the 1-34 within the next year, and I know that the glider is perfectly up to the task. Still, I often watch the fiberglass jockeys with a twinge of envy whenever they launch and disappear for hours at a time. I start dreaming about how nice it would be to own one and to have that type of freedom and luxury. But so far I have always managed to bring myself back down to earth by concluding that the time and money involved with glider ownership is a selfish extravagance incompatible with a family with young children. Since I had never flown in a fiberglass ship, I usually didn't have too hard a time coming to this conclusion. But then I got an invitation from Jim Emken.

I knew that Jim owned a Janus C, but the self preservation of my ego generally called for me to ignore him whenever he described his flight experiences. But now he was making a pointed offer for me to join him for a weekend of flying at Keystone Gliderport. The invitation came at the last minute (curse these single guys), but I managed to cash in some chips with the family and get permission to abandon them for three days.

We left after work on Thursday, April 24th. During the drive to central Pennsylvania, Jim gave me some more details about the airport and the soaring along the Appalachian ridge. I had read all of Tom Knauff's books and was excited about experiencing this legendary ridge, also known as the "longest diamond mine in the country". I was also looking forward to flying with Tom. I had first met him at the instructor's revalidation clinic in March, and was eager to see his teaching style in action. I knew that he is a designated flight examiner, and that it might be a possibility for me to take my commercial glider practical flight test with him. Unfortunately, I had done all my preparation work for the test in the Blanik, and if I was to take the test at Keystone it would have to be in a Grob 103. I would just have to see how it went when I got there.

It was a long drive (6 1/2 hours), so we didn't make it all the way there that night. At around 2:00, we stopped at a hotel about one hour short of the airport. We wanted to get there early on Friday morning, so after about five hours of sleep we were on the road again. As we approached the gliderport the ridge appeared on our left. It isn't a particularly high ridge (about 1,200 feet AGL at the northern end), but it extends for 500 miles from Williamsport, Pennsylvania southwest almost to Knoxville, Tennessee. As we drove along the ridge the landscape became increasingly rural, very rural. The closet thing to a town center I saw near the airport was a Sheetz gas station and convenience store (plenty of Penthouse, four-wheel drive, body building, and guns and ammo magazines for sale).

After a few miles of driving along the ridge you come to the airport on your left, just on the other side of a set of railroad tracks. The first thing you notice is the mass of about forty glider trailers parked along the edge of the tracks. Jim's Janus was in one of them. The license plates on the trailers are from around the country and several are from Canada. Clearly this is a major destination for glider pilots. A paved 2,600 foot runway lies parallel to the ridge. The ridge itself is less than a mile from the runway. The airport has four small buildings: an office, a combination bunkhouse and shelter for the towplanes, and two hangars. Tom and Doris live in a house up on the hill on the other side of the road, overlooking the airport. We parked and went to look for Tom inside the office.

The office is cleverly set up for glider pilots. As you enter it you are immediately confronted with long glass cases containing everything a glider pilot might want to purchase, including books, radios, variometers, oxygen equipment, "I'd rather be flying" mugs, GPS receivers, T-shirts, golf shirts, sweatshirts, sunglasses, Tom Knauff sanctioned soaring hats, potato chips, candy, and Schempp-Hirth sailplane brochures. There were also several plastic birds of prey for sale, although I still haven't figured out the connection to glider pilots. Behind one of the glass cases on a far wall is a relief map depicting the entire length of the Bald Eagle ridge. Opposite the map is a comfortable seating area and a stone hearth with outlines of sailplanes chiseled into the masonry. On the other side of the outer office is a doorway leading through a small study area into the inner office and inventory room. We found Tom back in this inner office, buried in paperwork from a recent Schempp-Hirth airworthiness directive.

Jim explained what we would be up to that weekend, and mentioned that I might be interested in taking my practical test with him. I said that I had never flown in fiberglass before, so Tom suggested that I immediately go for a ride with Steele, his resident instructor. Jim and I went to the hangar and pulled out one of the Grob 103's. After helping Jim assemble his glider, I got ready to take my first fiberglass flight with Steele. After a very quick briefing, we jumped in and got ready to take off. I was still slightly groggy from lack of sleep, and really did not know what to expect in terms of handling, coordination, and energy management. As we took off I experienced a slight PIO but quickly managed to bring things under control. During the tow I noticed that the glider required a *large* amount of rudder. After release, we spent a few moments practicing coordinated turns, but then immediately started searching for lift. As we continued to fly, Steele maintained a constant dialog instructing me in how to fly the glider. The more I flew, the more disoriented I became. I was having a very hard time flying well-coordinated turns, responding to Steele's suggestions, thermaling, and watching for ridge traffic all at the same time. Steele would periodically grab the controls in order to demonstrate something, but then I was never quite sure when he had passed control back to me. During our landing pattern, he pointed out that I hadn't immediately retracted the spoilers as we passed through patches of sink. I was not flying well. At the moment I felt like I was a lousy pilot and that the Grob was difficult to fly and not particularly impressive. We took a second flight, but the cockpit workload was still heavy and I improved only marginally. Oh well, I thought, we'll try this again tomorrow after I've had a full night's sleep.

Next I went up with Jim in his Janus. Now this was a real glider. Unlike the Grob, I found this ship to be easy to fly. Coordination seemed effortless, the handling was easy and predictable, and the glide angle was incredibly flat. Jim and I shared the piloting of a nearly two-hour flight, mostly in thermals close to the field. Although Jim flew the takeoff and landing, I now at least had the sense that there was no mystery to flying fiberglass.

As the day began winding down, Doris Grove suggested that we stay in their bunkhouse that night, since a Penn State football game that weekend might make it difficult for us to find a hotel room. I was happy to stay there, but Jim mentioned that he had already spent a lot of time in the bunkhouse that season. The bunkhouse is also right next to the railroad tracks, and apparently every night at 2:00 AM a heavily loaded train comes rumbling by. Jim said that the noise and shaking get so severe that he had actually seen things bounce off of the nightstands. Another person at the field recalled that the first time he heard the train at night, he got up in confusion, concluded that the building was on fire, and rushed outside before he fully woke up.

We drove into the town of State College that evening for dinner, and while we were there we looked for a hotel in which to spend the night. Doris was right. The only rooms available were at the most expensive hotel. Fortunately we later found a Holiday Inn several miles north of the airport, and in spite of a few inconveniences like no hot water we managed to sleep well that night.

Saturday morning I was well-rested and eager for another crack at the Grob. I was hoping that if I could get the coordination under control I might be ready for the flight test with Tom. I again flew with Steele, and this time I had no problems with the takeoff or tow. Steele knew that I was trying to get ready for the test, so he wanted to pack as much into the flight as possible. We went through all of the signals on tow, and after release we immediately went through a full course of stalls, slow flight, turns about a ground reference, and precision flying. I still didn't have the coordination fully under control, but things were going much better. Then Steele decided to lay on the distractions. We started by simulating a transition from high speed ridge running into the pattern. Then at the last moment Steele asked me to fly a right hand pattern on the other side of the airport, instead of the normal ridge side approach. I thought I was managing fine but then he began to get on my case about coordination, monitoring the vario, and my use of body English during the turns. As he shouted "You're flying through sink! Get those spoilers in!", I became flustered and turned to base too soon. The turn was into the ridge, whereupon I lost my attitude reference and let my speed climb about ten knots too high. "Watch your yaw string!", he admonished. I landed hot, and didn't stop the glider until we had traveled two thirds of the runway. Tom, of course, saw the whole thing.

That was it. I felt completely defeated and unworthy of taking my flight test. Steele agreed that my flying was not of commercial quality. He asked me how I did on the written test. When I said that I had gotten a ninety-two, he replied that that wrong eight percent could kill me and that he personally had never gotten anything less than a ninety-six on his written tests. With my tail between my legs, I walked over to Tom and told him that I wouldn't be taking my test with him that weekend. I just wasn't comfortable in the Grob and it didn't make sense to take the test until my coordination became effortless. Tom agreed, but when I said that I still wanted a chance to fly with him, he said that he would be happy to fly with me and that he would pull out his Duo Discus on Sunday.

That lifted my spirits somewhat, and now that the soaring conditions had improved I decided to abandon the Grob and fly with Jim in the Janus. We proceeded to have a fantastic flight of over four hours. We flew south for over 50K to the famous Altoona gap, and when we turned around to head back north, the glide angle of the Janus was so flat that we made it all the way back to Keystone with only a few turns in thermals. Mostly we just slowed down in lift and sped up through sink. By the time we made it back we had only lost a few thousand feet. Now I was really beginning to appreciate the advantages of high performance fiberglass. We flew north and west for another hour, but then I began to get airsick and Jim returned to the field to drop me off. As I recovered on the ground, Jim took off again and had another two-hour flight. The conditions seemed fantastic to me, but Jim said that they were only average for the area. There was a picnic at the field that evening, and everyone in attendance was in great spirits. Several people had flown over three hundred kilometers that day, and one proud pilot had completed his Silver C.

The weather on Sunday was beginning to deteriorate, but Tom still offered to pull out the Duo Discus. It was his birthday that day, and when I thanked him for his offer to fly the Duo he replied that he was just anxious to get some flight time after hearing Saturday's stories. Still, as we preflighted the glider he began quizzing me on all aspects of flying. What are the signs of rough air damage to a glider? What are the signs of flutter damage? What is Vd? What are the responsibilities of a commercial pilot? The tone of his questions was friendly, but clearly he was testing me. I hadn't studied the night before, but he seemed comfortable with my answers to his questions. We strapped in, and Tom let me take complete control of the flight. Instantly I felt at home in the Duo. It is probably the easiest to fly of all of the gliders that I have ever flown. The coordination was effortless, the handling responsive, and the stick forces were incredibly light for a 20 meter wingspan glider. Tom had me do tow signals, slow flight, steep turns and ground reference maneuvers. He delighted in demonstrating how during a turning stall, the sudden application of full opposite aileron at the worst possible moment causes no tendency to drop a wing. This is a truly remarkable glider. I had a great time during the flight, and I was happy with my pattern and landing. Tom's only comment was that it was obvious that I had spent a lot of time in Schweizers, and that I turned to base sooner than I should have for a fiberglass glider. He said that he was comfortable with my flying and that we should go ahead and continue with the ground school portion of the practical test. This caught me by surprise, but I eagerly agreed.

We went into the interior office and Tom gave me some Grob weight and balance and upwind final glide calculations to perform. He next grilled me on regulations, airspace, interpretations of sectional charts, weather and aerodynamics. He was very thorough, and I got the sense that he would pick up on any weakness and dig deeper in that area. My weaknesses proved to be in sectional chart interpretation, regulations and airspace. I learned a few things, such as the reason for the specific yellow outlines of populated cities on the charts (that is how they look at night), and was reminded of a few things that I had forgotten (federal airways are class E airspace extending four nautical miles on each side of the centerline). By the time we finished, Jim was just landing after another two-hour flight and reported severe turbulence in the pattern. It was beginning to rain, and Tom said that although we were basically finished, he couldn't give me the rating until he had seen me fly a rope break. He asked Jim if he was willing to stay an extra day, and Jim kindly agreed. The next step was for me to break the news to Sharon that I would be spending yet another night in Pennsylvania. The conversation went something like this:

Carl: I've had a great day! Tom took me up in the Duo Discus, and he said that I am qualified for my commercial rating!

Sharon: That's great! I'm glad that you're having such a good time.

Carl: The only thing is, I need to stay an extra night in order to get the rating.

Sharon: (long pause) You are coming back, aren't you? (another pause) It suddenly occurs to me that I don't know exactly where you are…

It poured that evening, and we went to a birthday celebration banquet for Tom. A number of well-known glider pilots were in attendance, including Karl Striedeck. The next morning we had to wait several hours for the weather to clear, but at around noon I began to preflight the Grob. I flew an unremarkable rope break (no coordination problems this time), and after we landed Tom noticed that the nose wheel pressure seemed a bit low. Jim and I searched for an air tank in order to reinflate the tire, and Tom went inside to complete the rating paperwork. After putting things away, I returned to the office and purchased a number of books, including one on sectional chart interpretation. Tom and Doris congratulated me on my rating, and after a parting comment from Steele ("I heard you got your commercial… with a flat tire"), we hit the road.

In spite of my initial disheartening experience in the Grob, I had a great weekend at Keystone. The ridge is an amazing place to fly gliders, and Tom and Doris have done everything possible to make the place welcoming for glider pilots. My flights in the Janus and the Duo Discus were eye-opening experiences, and I hope to fly them again soon. Maybe in time I'll even come to appreciate the Grob. If any of you are interested in flying fiberglass for the first time, Keystone is a great place to do it. Just make sure that you fly with Tom.

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For more information about MITSA, you can contact the club by email, visit our web page, or contact Joe Kwasnik, our director of membership listed above.

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