



Newsletter

Knoxville TN Oct 2017 AMA #594
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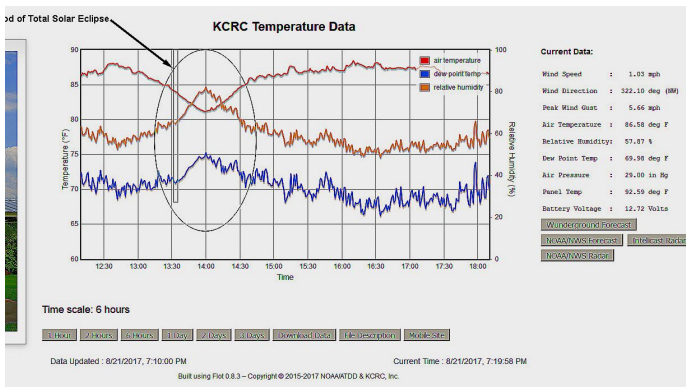
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THIS'N THAT

► **Wow!!!** Time marches on, and on, and on... October already and getting ready to start looking forward to the holiday season. I see some retailers are already displaying Christmas stuff and September is just starting as I write this.

► Don't forget that the Senior Pattern Association will be doing SPA's yearly Masters tournament at KCRC on October 7th and 8th. We held it a few years ago and it's a pretty big deal for our club. It would be nice if the whole club turned out to help the guys running the contest. KCRC members normally do a good job. Jimmy Russell and Phil Spelt will be CD-ing the event, so volunteer to help out if you can get there. They'll need all the help they can get and the more folks show, the less work for everybody..

► **Ed Dumas** sent a note on the data from our weather station during and right after the total eclipse we experienced in August. A rare event.



In the graph above, the time of the total eclipse is the vertical line indicated by the arrow. The top line shows the temperature drop occurring a few minutes after. About a 5 degree drop.. The mid and bottom line shows the relative humidity and dew point temperature.

I remember in a previous total eclipse in this area, my grandmother had a flock of chickens and as

the eclipse occurred, the chickens, thinking night was approaching, went to roost. Don't imagine too many folks have chickens in this day and age but I'll bet they went to roost where ever they were. I know I did!.

FLYING IN A TOTAL ECLIPSE.

“Jim :: I had a unique opportunity during the recent total solar eclipse on August 21, 2017 to fly NOAA/ATDD's DJI S-1000 to make measurements of the atmosphere and the Earth's surface under some truly unique conditions. We flew three flights at 90 minutes, 60 minutes, and 30 minutes before the total eclipse itself, a long flight during the total part of the eclipse, and then three remaining flights at 30, 60, and 90 minutes after totality.

We flew at a farm near Ten Mile, TN, in Meigs County, that is home to a cooperative weather observing station for the National Weather Service office in Morristown. The guys from NWS Morristown recommended the site and it turned out to be a winner! It was less than 1 mile from the line of totality, which yielded a total eclipse duration of 2:38, and the location was more than 5 miles away from any airports, which allowed us to fly the S-1000 to 1200 feet altitude. The skies were a little cloudy prior to the start of the eclipse, but by 30 minutes to go the cumulus clouds had all dissipated and the rest of the day was spectacular!

The flight plan for each flight was to takeoff and hover above a tower that had been temporarily installed earlier that day to measure air temperature relative humidity, wind speed and direction, as well as several solar radiation parameters. I did a simple climb over the tower to 1200 feet AGL, hovered as long as possible, then descended over the tower and returned to land. Each flight was performed exactly the same way to make the data reduction easy.

The totality flight was timed so that the aircraft would be hovering at 1200 feet just before the sun was completely obscured. This worked out quite well and left me with little to do other than catch brief glimpses of the sun and its corona while the DJI obediently hovered during all the hoopla. The view of the eclipse was truly

spectacular but I had to steel myself to keep my mind and eyes on the job at hand, flying the aircraft. Remembering the most recent crash of my Goldberg J-3, I wasn't about to let myself get caught up in the moment again!

As expected, the light during the totality flight was quite spectacular and varied greatly, but the LED lights on the S-1000 made it extremely easy to see and fly, even 1200 feet away. In fact, of all the flights, that one was the easiest in which to see and control the aircraft. I noticed a marked decrease in temperature (10 degrees at the surface!), lots of birds flocking, butterflies flying, and quite a few other aircraft in the sky with their landing lights on during the darkest part of the flight. Also the turbulence level in the air was markedly lower than it had been all day.

That flight, and all the others that day, went off without a hitch and we have a truly unique data set that we will quickly analyze and turn into a couple of journal articles and a conference paper to be presented early next year. The timing, placement, and weather of the total solar eclipse in East Tennessee gave us a unique opportunity to do some cool research right in our own backyard....Ed Dumas “



Illustration 1: Getting a little darker

What a great experience! A once in a lifetime thing. Thanks, Ed, for sharing this effort with the club..

► If you've been reading the NL you'll know about L.A. Johnston's Windlord. It's an old timer flying wing. L.A. bought a used one at a SAM contest back in the summer, decided to get another kit and build a new one. The old one had spoilers on the underside of the wing but they were not very effective. L.A. built his new one and put the spoilers in the same place on it. Both models were built the same way and weighed within 8 ounces of each other. He said when he tried the spoilers on the new one, it pitched violently upward and the spoilers were a bit too effective. It's kinda weird how two models, supposedly alike, will react differently. I used to build a new Ugly Stik every month. All scratch built. None of them flew exactly like the previous one (but they all flew well).

► Got a note from Jimmy Russell saying he had converted a Gentle Lady to electric by installing a small brushless motor and a Lipo. Said this was his fourth Gentle Lady. This one was a Great Plains ARF but he built the others from Goldberg kits.

I built one a few years back and powered it

electrically and loved it. Great flyers.

If I'm not mistaken, KCRC's Doc Shacklett had a hand in the design work with Carl Goldberg on this model back in the day.

Adventures in Home CNC Milling

by Kay Kasemir

Now that most everybody has a computer and printer at home, it looks like we're about to enter a time where many people add a 3D printer. Personally, I'm not quite ready for additive manufacturing. OK, if you're into quad-copters, I can certainly see a use for 3D printed parts. But I'm still more into wooden airplanes. The main reason, though, is that the thought of a noisy mill that destructively chops away wood with chips flying everywhere seemed more appealing to me than quietly building up tiny layers of plastic.

Since last December I'm thus the proud owner of a small CNC mill, which I've used to cut parts for my latest model airplane project. Primarily ribs, some formers, the leading edge of the horizontal stabilizer, wing tips.

So how would you use that to, for example, create a control horn? I'm glad you asked! It's basically a three step process: Draw (CAD), arrange for machining (CAM), and cut (the noisy, dusty part).

Step 1: Drawing

First you need to have a computer drawing of the piece you want to cut on the computer. This must be a vector drawing, a collection of lines and curves with exact coordinates. One example of a suitable commercial program for "Computer Aided Design", or CAD, is AutoCAD. I have used LibreCAD, which is simpler, but free and sufficient for my needs. My machine happened to include V-Carve, so I use that most of the time. In any case, you need to create a drawing where you place the control horn holes as circles with the exact 1/16" diameter at the desired location, then you add the outline etc. In a CAD program, it's easy to for example arrange the circles which represent the holes in the control horn to be exactly in line and equidistant.

For the rest of the airplane, I happened to have an image file of the full plan. This, unfortunately, was NOT a suitable format, because it was just a bunch of pixels, not vectors. I tried some free software to vectorize the file, but wasn't happy with the results. Smudges in the image are turned into lines. Parts which I know to be rectangles with square corners are vectorized as trapezoids. In the end, I used the image of the plan as a background layer in the CAD program and drew the pieces I wanted to cut on top, where I manually asserted that what I know to be square or symmetrical or exactly 3mm wide to be just that.

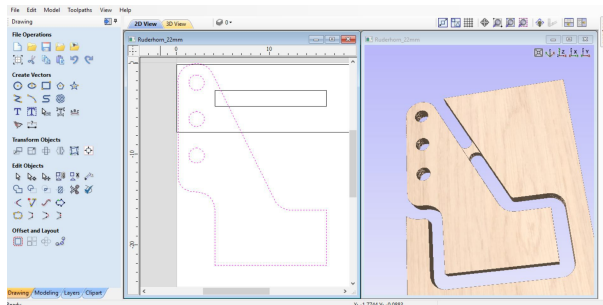
Overall, the drawing phase takes the most amount of time.

Step 2: Arrange for Machining

Now that you have a bunch of lines for a piece you want to cut, you need to tell the computer if you want to cut inside or outside of those lines, what size of milling

bit you want to use, if you want to cut all the way through a 1/16th sheet of wood, or if you just want to cut an 1/8th notch into a 1/4th thick piece.

I have not used any free software for this Computer Aided Manufacturing, or CAM, step, since the functionality is included in the V-Carve software that came with my machine.

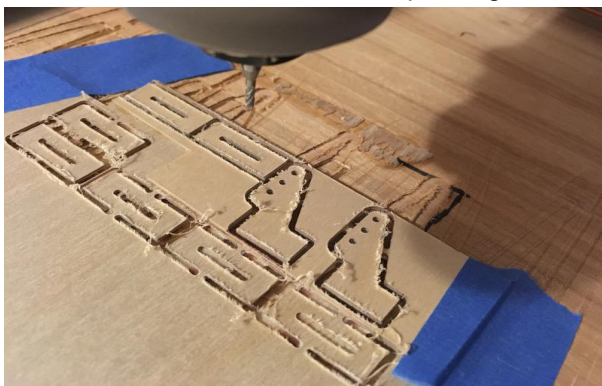


In the screenshot, to the left, shown as purple dashes, is the control horn drawing. To the right is the simulated result of cutting the holes and the outline from a piece of wood. The holes are cut on the inside, the outline is cut on the outside. In addition, a “tab” is left when cutting the outline. This tab leaves the control horn attached to the sheet of wood. If you don’t add tabs, just when you think you’re done cutting the piece, the rather small control horn has a high likelihood of floating into the cutting bit, which will shred it to dust to be sucked up by the vacuum. This is a very fast and clean operation, but has the disadvantage that you won’t have a control horn after all, so I now add tabs to all pieces.

The result of the CAM step is a “G-Code” file, a list of commands like “turn milling motor on”, “move milling bit to position 1”, “move milling bit to position 2” and so on.

Step 3: Cutting

Now you fix some wood to the machine bed, where I use a combination of clamps and tape. Put a milling bit into the spindle, load the G-Code file into the machine control software, attach the vacuum to the dust collection port of the spindle, put in earplugs(!), and press the “Go” button. A little while later, you have control horns. Or, in case you forgot to ask for retaining tabs, you have a piece of wood with empty spaces where you expected to find control horns. In the picture, you’ll see that there’s a lot of fuzz that I’ll have to sand off. Depending on the



plywood or balsa, in combination with the type of milling

bit and speed, the milled parts require no sanding or a lot of sanding. I’m still trying to figure out what works best

Final Result

Here’s the control horn with base plate attached to



an aileron. Control horns are a good example for effectively using a CNC mill: Once you have the drawing, you can cut 1 or 10 of them in almost the same time. Ribs are another good application....Kay

► KCRC member Bill Metheny was at KCRC recently and got to see KCRCer Paul Funk doing some tricky flying with his beautiful Pitts Special. Paul was practicing and entertaining the KCRC members present while doing so..

Oh, did I mention that the Pitts was a full size model and Paul was practicing for full size aerobatic competition? Bill took this picture with Frank Allemann looking on. If Frank had a transmitter in his hand it would have looked like Frank showing some fancy flying skills.



KCRC Meeting Minutes— September 12, 2017

President Rick Thompson called the meeting to order at 7:00 p.m. at the KCRC field with 17 members in attendance. There were no new members although two previous members rejoined KCRC.

Rick announced that John Williams passed away recently. He had worked a lot with Gene Waters in building planes. (Reported in a previous NL).

There were no corrections to the August minutes,

which were approved by unanimous voice vote. Joel Hebert gave the treasurer's report, which was approved by unanimous voice vote.

Rick reported that the August 19 Fun Fly coordinated by Paul Funk and Randy Philipps was a success, drawing a big crowd and providing great fun, interesting performances, and Jerel Zarestky's ice cream.

Rick reported that the September 9 full scale fly-in at the Tellico Plains airport was attended by several KCRC members for a possible RC flying demonstration (as noted in last month's minutes), including Rick, Phil Cope, John Basalone, Jerel Zarestky (Rick, please provide the names of any others). However, no one got to fly RC due to incompatibility with the number of full-scale planes there.

Bill Dodge completed filling the cracks in the runway, with several other members helping. Bill reported that the plan is to apply a full top-coat of sealer on September 16, the day of the Mud Run, starting at 8 a.m. Several members volunteered to assist with the stirring, pouring, and application of the sealer. Joel Hebert will send out an email announcing the need for volunteers.

Phil Spelt discussed Mud Run activities. A ditch was excavated along part of the driveway to prevent erosion. The fields are supposed to be mowed Thursday. The parking area will be marked Friday.

Phil also reported that a Challenge Coin had been presented, through him, to KCRC by Sergeant Major William Hudgens and that he will provide a write-up for the newsletter.

Phil also mentioned the Harriman RC fly-in benefit for needy children of Roane County to be held September 16, the day of the Mud Run.

Rick Thompson mentioned that the October meeting will be the last one at the field this year.

Phil Spelt discussed the SPA competition to be held at the KCRC field October 7 and 8. Registration begins Saturday at 7:30 a.m. KCRC volunteers are needed.

There were no entries for **Crash of the Month**.



Randy Phipipps sent this picture of Kay's MOM winner.

Model of the Month was won by Kay-Uwe Kasemir, who showed a Light Wind Mosquito glider with electric motor and 2.5 meter wingspan. He built it, beginning last December, from 1975 plans by Graupner.

Bob Helsel mentioned that the KCRC sign on a utility pole near the beginning of Williams Bend Road was faded and hard to see.

The meeting was adjourned at 7:34 p.m.

**Respectfully submitted, Roger Kroodsma,
KCRC Secretary.....Roger**

► Both Michael Catlin and Roger Kroodsma sent me a picture of the crew who showed up to help Bill Dodge get the runway ready for winter. Water seeping into cracks and freezing does a lot of damage to our asphalt runway. Sealing it helps tremendously.



This is Roger's picture of a great turnout.

Thanks a lot, folks.

► Several KCRCers visited an air show at the Tellico Plains airport at the invitation of the organizers. Turns out they weren't able to fly RC because it would interfere with the full size planes. They were able, however, to put out a display of their models.

Ed Dumas sent a list of the folks he saw there. John Basalone, Phil Cope, Ed Dumas, Jerel Zarestky (flew in in his Sport Cruiser), Steve Jones, and Rick Thompson.

Jerel flew in in his Sport Cruiser and Ed got a picture of both of Jerel's planes.

