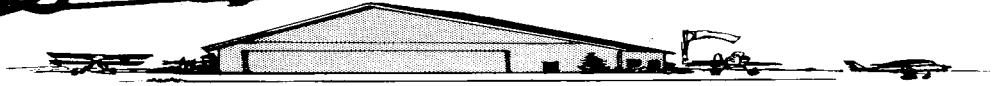


CHAPTER 55 EXPERIMENTAL AIRCRAFT ASSOCIATION

MAY 2005

Wingtips



Meetings are the 2nd Saturday of each Month

Chapter 55 Hangar - Mason Jewett Field

Pres: Mike Arntz 694-4601 Vice Pres: Tom Botsford 663-1318 Treas: Gregg Cornell 351-1338

Sec: Drew Seguin 333-4531 Editor: Warren Miller 393-9385

Climb and Maintain Flight Level 55

METAR KFNT 082353Z 15007KT 10SM CLR 19/06 A3004
RMK AO2 SLP172 TO1940061 (MJA)

I am at work and the weather as you can see is beautiful, so why aren't you out flying?

The weather is getting warmer, the days longer, the good flying days are here. With two flying contest going, along with two aviation events planned, we should have a very busy year and lots of flying.

Speaking of flying contest, did any one see the article in the Chapters section of this month's Sport Aviation? The article highlighted last year's contest thought up and presented by Steve Houghton; the winners were, Ken and Vicki Vandenberg, first place and Doug Koons, second place.



Airport Challenge Contest Winners
2nd Place-Ken Vandenberg and 1st Place-Doug Koons

The goal of the contest was to see how many different airports chapter members could land at over a one-year period.

When headquarters contacted me about our contest, they had been looking at our website. They asked permission to use it in the Sport Aviation magazine so other chapters could use it to boost chapter flying activities. When they ask me to write about

it, I contacted Steve Houghton. Who better to write about it than the originator of the contest. He agreed and sent a fine article which most of it is in the Sport Aviation magazine. I added a few things, also outlined the two new contests for this year one by Deanna McCreary (*Photo*) and one by Vicki Vandenberg (*Fly a Member*) and then sent it in.

When I read about our chapter contest I was surprised to see that my name was at the end as the author. As much as I would like to take credit for such a fine article, I must give credit where it is due Steve Houghton is the author and I feel he done an excellent job. Thanks Steve, your contest has now gone worldwide.

MAY SCHEDULE

Board of Directors' Meeting

Wednesday, May 11, 2004

Chapter 55 Meeting

Saturday, May 14, 2004

8 - 9 Breakfast / 9:30 Chapter Meeting

We had an envelope stuffing, addressing and mailing party at the terminal last week. We sent out brochures about both of our events (June 12 and August 20, 21) plus sponsor sign up forms. There were over 100 sent to airports and businesses, with plans for more to be sent out . . . looks like we will have the advertising covered very well.

Again I sound like a broken record; we need people to sign up for jobs for the events. We need to know who will be working in what positions so the chairperson can assign shifts, jobs, places and duties. And in the case of flight line safety, aircraft parking, security personnel, safety briefings prior to the event, our chairpersons will need to go over all precautions with their respective groups. We need to get things organized so there are no surprises. I know most folks just show up and work which is fine but the chairpersons will be very busy and may not be able to give you adequate instructions which could result confusion.

There has been discussion on where to park the B17. It was discussed at the last planning meeting and the committee unanimously agreed that the B17 will be parked near the chapter hangar with the terminal as a back up in case the ground is saturated from rain.

We will be able to conform to all safety precautions recommended by the FAA and fully expect an FAA representative to be present at the August event due to recent inquiries.

See you at the meeting. Remember take a chapter member with you next time you go flying.

Mike Arntz
President

Greasy Side Up

Tower: "Eastern 702, cleared for take-off, contact Departure on frequency 124.7"

Eastern 702: "Tower, Eastern 702 switching to Departure. By the way, after we lifted off we saw some kind of dead animal on the far end of the runway."

Tower: "Continental 635, cleared for take-off behind Eastern 702, contact Departure on frequency 124.7. Did you copy that report from Eastern 702?"

Continental 635: "Continental 635, cleared for take-off, roger; and yes, we copied Eastern... we've already notified our caterers."

BREAKFAST W/CHAPTER 55

<p><u>May Team</u> Kyle Bradford Ken Drewyor Gordon Hempstone Steve Kent George Moore Richard Riisberg Dennis Swan</p>	<p><u>June Team</u> Charles Brown Lou Farhood J. Morris Hickman Dan Schiffer Ralph Taggart</p>
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April Cooks: Carol and John Kennedy and Rocky Stone

EAA Board of Directors Meeting

Board of Directors Meeting – April 5, 2005

The meeting was called to order at 7:07 PM → Attendees: Mike Arntz, Gregg Cornell, Doug Koons, Gary Long, Drew Seguin and Jack Toman → Treasurer's report was approved. → Secretary's report was approved → The property rent for the Chapter 55 hangar was raised to \$131 in accordance with our lease with CRAA. → Mason Aviation Days: Insurance forms have been re-submitted. There have been two event-planning meetings held. Future meetings are on the third Tuesday of each month. Next date is 5/17. → The Board approved Steve Kent's request to participate with a display of Powered Parachutes. Dansville Scout troop 21 has offered to participate in the event. → We are having some trouble with hangar roof leaks. Doug Koons and Gary Long will explore options and report back to the Board. → The trim on the Chapter Hangar needs to be painted. The Board will solicit volunteers from the membership to get this job done. → Meeting was adjourned at 8:04 PM →

EAA Chapter 55 Business Meeting

Membership Meeting – April 9, 2005

The meeting was called to order at 9:30 a.m. → 53 members and guests were present. → The Treasurer's report was approved. → The Secretary's report was approved → Mike Arntz updated the group on progress to date on Mason Aviation Days. We still need volunteers to sign up for various duties. → Warren Miller is back in charge of the Chapter 55 Newsletter. → Mike A. described the problem with roof leaks. → Doug Koons was awarded \$75 for winning the 2004 flying contest. Ken Vandenbelt won \$50 for second place. → Bill Purosky has some rooms available for Oshkosh. Chapter 55 members will also be camping at 14th and Elm. → There will be a "First Responders" workshop at Mason Airport on May 15. Tom Botsford is one of the coordinators of this event. → There will be an airshow at Selfridge Air Force Base on May 20-21. → Al St. George presented a chart he has prepared on auto engines and matching propellers for homebuilts. → There was general discussion on the mix-up between Chapter 55 and the Mason Chamber of Commerce about the Balloon Rally and Mason Aviation Day. Bill Purosky read the clarification letter which was sent to the Chamber. The matter is resolved. → Ivan Kerr gave a presentation on Ballooning and his home-winning balloon drop. → The meeting was adjourned at 10:12 AM.



Guest Speaker Ivan Kerr tells about his hot air balloon adventures.

Tidbits

By Vicki e Vandebelt

No news for May but watch this spot – it’s gonna get busy

Young Eagles

By Renee Arntz

No updates for May but activities will be coming up soon with summer coming.

Notes from Cape Juby

By Terry L. Lutz, Chapter 55 Flight Advisor

First flights and development flight-testing of any new airplane, homebuilt or the A380, is a team effort. You can’t do it alone, although the work that you have done as the builder is uniquely yours. For example, the kit manufacturer is going to supply you with the basic weight and balance guidelines. It’s up to you to consider the changes you might have made to the airplane and do an accurate W&B to see where the CG really is. The builder supplies the FAA inspector with all the required paperwork. The FAA guy rewards you (we hope), with a Certificate of Airworthiness. In between, there is a whole lot of inspecting going on. Experienced eyes will look things over for what may be the final time before first flight. The tower controller or chase pilot is going to clear the airspace for you as you go through your final checks. It IS a team effort.

To improve the safety record of homebuilt aircraft on first flights and during their mandatory flight testing, EAA developed the Technical Counselor and Flight Advisor programs. We are fortunate here in central Michigan to have some very competent people in both categories. And, there are others who are highly qualified with practical experience of their own and are willing to lend a hand. They are equally concerned about safety, YOUR safety, as the FAA and the EAA. Not to mention your insurance man and the guy that lives at the end of the runway.

In the last newsletter, I mentioned that we were preparing for first flight on a new airplane, a Van’s RV-7A “AnnAngel”, built by Dave Pohl of Pontiac. The airplane was painted by Robert Parker at Tripp Creek Airport, and assembled there under the watchful eye of Robert, Roy Thelen, and Carl Franz. It was inspected by Ted Gauthier, another RV builder, who is a DAR.

After many weeks of careful preparation, adjusting, and ground testing, the airplane was finally ready for its first flight. Here’s how things went.



On the appointed morning, April 6th, the weather was fair with light winds. Tripp Creek Airport was still a bit soft, but Robert had rolled it several times. It was as flat as it could get and would easily support the small tires of the RV-7A. Our plan was to takeoff, orbit over the airport to ensure that the engine was functioning properly, check for other problems, then proceed to Pontiac Airport via direct Owosso, direct Linden, direct Pontiac. This would keep us heading toward a good airport should any problems develop enroute.

When you are doing the final checks on a new airplane, you do it with power on to check radios, program the avionics, etc. On a big airplane, you connect to ground-based power. On a homebuilt, you usually use the battery. But, you must remember to keep that little jewel charged! So were briefed up, strapped in, the weather was good, and when I went to start the engine, it would barely rotate. Whrrrr, whrrrr, pop, whrr, whr, nada. Dead battery. Very embarrassing. So we carefully removed the battery and put it on a quick charger. Two hours later, the airplane was buttoned up and finally ready.



The engine started nicely, the chase cranked his engine (Robert Parker in his RV-8 “Sizzlin’ Sue”), and we taxied for takeoff. I released brakes for takeoff on runway 27, with Robert spaced nicely behind. The airplane accelerated smartly, lifted off, and I set power for climb. Parker flew high and to my right, and was mostly out of sight, but right in position. Climbing to 4500’, everything seemed to be working just fine. We orbited the airport as briefed, and I was getting ready to take some engine readings when the avionics started to blink on and off, headset noise increased, and I lost contact with both the ground and the chase. For some reason, the electrical system had failed!

For a round dial airplane, this would normally not be a big problem, but on Dave’s airplane, the failed electrical system also failed the Grand Rapids Technologies Engine Information System (EIS), which provided all the engine information except rpm and manifold pressure. So with a new engine to worry about, I knew it would be necessary to land “as soon as practical”. The question was: Where? We had planned to use a hard surface runway for the first landing, but Tripp Creek was still an option.

On the first flight of the XB-70, the crew lost radios. On the first flight of the B-2, the crew lost radios. I had experienced radio glitches on first flights with Lou Farhood’s RV-8, and Ted Gauthier’s RV-6. Just in case, I had stowed an ICOM handheld

radio in my kit bag. It was charged and ready to use. So I took off my headset and used the ICOM to contact Parker in the chase, who relayed my predicament to the ground. Over the noise of the airplane, I could hear that the decision was to return to Tripp Creek.

So with 15 minutes in the airplane, I set up for landing. Fortunately, I had turned everything off to save what little battery power I might have, and both the electric flaps and electric trim had enough power to function. I slowed to 80 mph, extended landing flaps and asked Parker to verify the airspeed. He confirmed that it was correct, and I descended toward final for a normal landing. The problem was in the ground path to the alternator field circuit. It took another couple of hours to troubleshoot and correct the problem, and I was back in the air and on the way to Pontiac.

The airplane has 9 hours on it now, and we have had a small number of problems to correct along the way. The prop was not generating full rpm due to a rigging problem at the prop governor. And there have been repeated nuisance warnings from the EIS, which we continue to work on (almost gone as of this writing), and the fuel gauge had to be calibrated.

I can't emphasize enough how important teamwork is to the safe conduct of first flights. Dave Phol put in a lot of time making sure everything was done correctly. He had the right parts, the right tools, and the right documentation. Roy Thelen tackled a lot of last minute details, and did a superb job of troubleshooting the ground problem. Robert Parker did an excellent job of looking the airplane over and made sure that the assembly process was done correctly. He also did an excellent job as chase pilot, as you can see from the perfect position he is in as I am touching down on the first landing. The flight was carefully briefed and we were adaptable to a changing situation.

So with a lot of good flying ahead of us this summer, remember to fly safely out there, and as always, don't forget to lend a hand to your fellow pilot when they need it.

Using Alternative Sources for Nav and Strobe Lights

By Scott Gettings, EAA 724



Background

Many experimental builders are concerned with the high [prices](#) and lack of flexibility when using products from Whelen or Aeroflash to [light](#) their aircraft. In some configurations, a complete nav/strobe system can

run the better part of \$1,000.00. Ouch. I'd prefer to spend that money on an [engine](#).

Another consideration if you are building in a "lensed" wingtip [light](#) for reasons of appearance and/or aerodynamics is that the fancy streamlined [light](#) housings are just not necessary. They only add unnecessary cost and weight.

Strobe and nav lights have geometric visibility and intensity requirements for certified and experimental aircraft. These specifications are available from multiple sources, including Aircraft Spruce & Specialty. Basically, you need 360 [degree](#) strobe coverage horizontally, plus 30 [degrees](#) of vertical visibility. The side position lights need 110 [degrees](#) of horizontal coverage, and a white tail position [light](#) must be seen from 70 [degrees](#) aft. The intensity requirements are a little vague for experimental a/c, but 400 candlepower (cp) for strobes and 40 cp for nav lights appear to be acceptable values. These requirements can be met in many ways, most often by two "external" wingtip combination lights, or two internal wingtip and one tail strobe/[light](#).

[Light Intensity and Luminescence](#)

In searching for alternative [light](#) sources, I found that [bulbs](#) may be rated in lux, lumens, [candles](#), candela, foot-candles, millicandles (mcd) and candlepower (cp). This is confusing, since there are not good conversions among these measures. In the most simple terms, it appears that [candles](#) and candela are the same, and a [candlepower](#) is one [candle](#) of brightness measured at one foot. A lumen is the [light](#) produced by one [candle](#) shining in one square foot one foot away. A lux is 1 cd at 1 meter. Overall, it sounds like these terms are pretty similar for our purposes. You just need real bright lights on [airplanes](#). For more information, see:

<http://www.intl-light.com/handbook/registered.html>

Strobes

The [prices](#) for aircraft strobe systems are truly shocking. For each location, you need the bulb, its lens, and the power supply. I began searching for alternatives to high aircraft [prices](#) since strobes are made for many other vehicles at a fraction of the cost (no surprise here). However, it is quite hard to get [light](#) intensity specs for most non-aviation strobes. If this were possible, you could probably find acceptable strobe [bulbs](#) in the \$10-20 range and similarly inexpensive power [supplies](#). More practical strobe alternatives may include non-standard vendors of bulb-power supply systems or using LEDs. If you plan to use a conventional system, you can get inexpensive [bulbs](#) that will put out >400 cp for around \$30 at:

Rollison [Airplane](#) Company, Inc.

Bloomfield, Indiana

<http://www.airplanegear.com/skybright.htm>

or visit us at: www.RLSA.us

Call Rob Rollison to get just the strobe bulb if you want to mount it separately. Their power supply is around \$150, and will push 3 strobes in flashing [patterns](#). This is far more reasonable than Whelen's unit at around \$400. Rollison also carries the 16-gauge, shielded 3-wire strobe [cable](#) for about \$0.50 per foot, which is far less expensive than anywhere else. You need this shielded [cable](#) to avoid RF interference.

LEDs

[Light](#) Emitting Diodes have come a long way in the last few years. Although LEDs were initially used only for low-light displays, higher powered lights have now come on the market. Unfortunately, the cheap "high intensity" LEDs sold by [Radio](#) Shack and most other vendors really don't help us much. Very recently, a company called Luxeon has produced inexpensive, truly high-intensity LEDs you can [buy](#) over the [internet](#).

LEDs draw amazingly small amounts of current, such as from 350 milliamps up to 1 amp. Using this little current not only helps in the total power requirements of a plane, but also allows much [lighter](#) wiring to the nav lights. LEDs also come on in nanoseconds, last 100,000 hours and have no filaments to break.

LEDs can be used for strobes when both the intensity and visibility requirements can be met. Depending on your installation, this may require multiple LEDs and/or a reflector. For example, replacing a tail strobe/white nav [light](#) could be done with a small cluster of Luxeon LEDs. A strobe using LEDs will require a device to flash its power supply, which can be done using a variety of inexpensive options.

The newer, truly high-intensity LEDs can also easily supply the intensity and visibility requirements for nav lights. These can be wired directly since no flashing is required.

Wiring LEDs

Hooking up these lights is very simple and inexpensive. There are two main critical factors: you can't hook them up with the polarity reversed, and you can't over-drive them past their maximum current. You can push them a little, however. You will need to know the voltage drop of the LED(s), which is called Vf (for forward voltage) and their normal current in milliamps (ma). This is on their spec sheets. Typical values might be 3.2 volts and 350 ma. You can hook as many LEDs in series as you want until the sum of their voltage drops equals your system voltage. For example, if you used four, 3.2 Vf LEDs in series, you will use up 12.8 volts. You probably have 13.4 or so volts in your "12" volt system, so this will work. The basic formula is:

$$V = V(\text{system}) - V(\text{sum of LEDs in series})$$

If you only want to use 2 LEDs at 3.2 Vf, and you have a 13.4 volt system, you will have $13.4 - 2(3.2) = 7$ volts. You have to dissipate the remaining 7 volts to avoid

exceeding the maximum current for each LED. You can do this with a \$0.10 resistor.

$$\text{Ohm's law says } V=IR, \text{ so} \\ 7 \text{ volts} / 0.35 \text{ amps} = 20 \text{ ohms}$$

Get the nearest 1/2 watt resistor to your value (22 ohm in this case) and put it in series with your two LEDs. Be sure to hook up each LED from positive-negative-positive-negative so you keep their polarity correct. The resistor can be on either side of the LEDs. The LEDs will get a little warm, but the resistor will get hot so keep it from touching anything important.

Since the LEDs are so cheap, you may wish to simply put as many as you wish to "eat up" your system voltage. If you want to get fancy, you can get small, constant current drivers from a number of sources (below) to deliver an exact current. These drivers deliver a constant current to the LEDs, but seem unnecessary for our applications. If your system voltage drops momentarily, the LEDs will harmlessly dim for a second or two. In my experiments, they don't change that much with minor fluctuations. You can also wire LEDs in combination parallel and series if needed, as long as the individual Vf and current requirements are met.

An easy way to build your system is to place a milliammeter in series with your test circuit of LEDs. With a direct current readout, you can play with different size resistors and number of LEDs to optimize your system. You can also use the simple calculator at: <http://www.ledsupply.com/techinfo.html>. This company also offers LED drivers for less than \$20. Another, less expensive supplier is American Backplane, 355 Bantam Lake road, Morris, CT 06763 (860) 567-1568. Neither source of drivers is as inexpensive as a resistor - or even another LED!

Sizing LEDs

The only company I found that offers high-intensity, affordable LEDs is Luxeon. See http://www.lumileds.com/luxeon/products/products_in_dex.html and [download](#) the "Star" datasheet. (Log in as a "guest").

The most usable form appears to be the Star in the Lambertian (140 [degree](#)) [light](#) pattern. It is less than the size of a quarter, has a built-in heat sink, and has multiple solder terminals to choose from. Luxeon [stars](#) come in 1-watt, 3-watt and 5-watt sizes. You can only get red (at this time) in the 1-watt size. They put out 44 lumens, where the green 1-watt size only puts out 30 lumens. However, you can get a 3-watt green with around 80 lumens and a green 5-watt with 120 lumens! The green 5-watt have a voltage drop $V_f=6.8$ volts, so two of these could be [hooked](#) directly to a 12 V system. In my experiments, two of the red, 1-watt [stars](#) are so bright you can't readily look at them - bright enough! Other experimenters have measured the output from

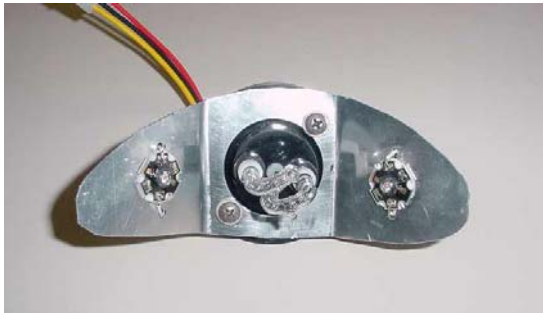
these LEDs with satisfactory results:

<http://www.jbwilco.com/Cozyweb/navstrobe.htm>

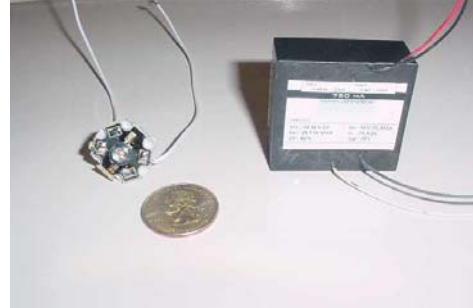
For strobes, you could use the white Star III, which produces 80 lumens @1 amp and 3.9 Vf. Five of these would give you 400 lumens. They cost \$15 each, so you could make a combination tail strobe / position [light](#) for \$75 that lasted forever. This is one heck of a lot cheaper than the \$180 Whelen tail combination [light](#) I bought - and no power supply or heavy [cable](#). You just need a simple switching circuit to flash them.

The best place to [buy](#) these is at www.luxeonstar.com. They have the best [prices](#) right over the [internet](#).

A combination conventional strobe and LED nav [light](#) wingtip with reflector might look like:



The Luxeon [Stars](#) and a sample driver alone are quite small:



Hopefully this short article will give builders some inexpensive alternatives to their nav and strobe lights.

Scott Gettings
Melbourne, Florida
Glass [Goose](#) in progress