

# Cockpit Chatter

By Roger Bocox

President's Column

August 2003

As of the writing this column, Airventure 2003 has not started yet. For most of us, I am sure, it is just "Oshkosh". It is almost like Christmas Eve, where you wait in anticipation for the coming event. For us in the aviation community, Oshkosh is the Mecca of aviation activity. "If it ain't there, then it probably don't exist." If you have never made the pilgrimage to Oshkosh, you are missing a great event. Everyone needs to go at least once. It seems like once you go, you get hooked and want to go back again and again.

Just think about it. Where can you go and sit down and have a conversation with people like Paul Poberezny, Chuck Yeager, Bob Hoover, etc. etc. etc. I spent most of the day with Patty Wagstaff a number of years ago, and you know, she is just a pretty regular gal! She just has a quite different way of spending her time—to say the least!

Then, there are the planes. If you dream it, someone has probably built it and is flying it. If it is really strange, then it must be something Burt Rutan dreamed up. How about getting up close and personal with an F-117 Stealth fighter? Or is a WWI biplane your cup of tea? Whatever you like, it is there.

I, personally, like to go there to buy parts. I save my lunch money all year to find that special widget that is only available at Oshkosh. One year it was a radio. Another year it was a bunch of instruments. This year, it might be a set of brakes and other small parts. I also am looking forward to see the Van's new RV-10A. This might take his company to a new level. For those of you who don't know, the RV-10A is supposed to

debut at Oshkosh this year. It is an RV-6A that has been stretched, resized and made into a 4 passenger plane. That ought to be a wonderful plane for a family or just anyone who wants the extra room and load carrying capacity. It should be reasonably priced as a kit, so it would be a great airplane and should be in great demand. And then there's the.....Flymarket, forums, maybe I should try my hand at covering or welding or..... The Theater in the Woods should have some great programs in the evening, and..... I sure do miss some of those guys we hang around with up there. It sure will be good to see Tony and Jerry and Tom and Laddie and Winchester and .....

Sorry, I was just daydreaming for a moment. I kind of get caught up in the aura of Oshkosh. The best part is seeing old friends that you only see about once a year—people from, not only, all over the country, but all over the world. You sit in the campsite, and you never know who might stop by. One year it was an ex-Russian MIG pilot. Really a nice guy. Even gave me a cap pin.

I guess what I am trying to get across is that there is a lot more to Oshkosh than just airplanes and parts and an air show. It is the camaraderie of like people enjoying something that we all love—airplanes.

On another note, don't forget the picnic on the 9<sup>th</sup> of August. This will be in lieu of our regular monthly meeting. It will be at the Ankeny airport just like last year. The chapter will be providing meat, drinks, condiments, place settings, etc. All you need to bring is a dish or dessert to pass. Fly in and give rides, or whatever. Remember, it will start around 1 PM and we are planning on eating around 3 PM. We should all be able to get a lot of hangar flying in as well as some real flying too! See you there!



*The Leader In Recreational Aviation*

PROPWASH



August Chapter Meeting... Is the annual chapter picnic. Saturday, August 9, 2003 at Ankeny Airport in the hangar. Starts 1 pm. We'll eat about 3 pm. Chapter to furnish the meat, drinks, and place settings. Each member brings a dish to pass, along with your lawn chairs. Bring your family, and enjoy great food and conversation.

YOUNG EAGLES UPDATE



Saturday August 18, 2003 from 9:00 am to Noon we need pilots, planes and ground personnel for flying Boy Scout Troup of Greg Long. Dave Kalwishky has volunteered to fly and his wife Terri will be in charge of the paperwork on the ground. There could be 26 scouts, along with their parents to fly. Alan will be out of town, so please contact Dave (home 266-4001 or e-mail:

dave@kalwishky.com if you can help.

Another reminder to call Dave Kalwishky if you can help him fly those who signed up at the Model Aires event. He is flying them on an individual basis, so these can be scheduled whenever you have time to fly.

Bill's Maiden Flight



Check The Plan



New Hat (a must!)



Make Vroom Vroom noises



Last chance to reconsider



Damn...it really does fly

# AIRCRAFT WIRING

By Roger E. Bocox E.A.A. Chapter 135

As most of you know, I am an electrical engineer. Being such, I am very interested in the wiring in aircraft. I have seen all types of aircraft wiring from fantastic jobs to dangerous wiring jobs. Our illustrious newsletter editor, Donna, is always looking for filler to fill up the pages of the newsletter. Some months, she has more articles, pictures, etc., that she knows what to do with, and other months, she is looking for things to fill up the blank spaces. I have been commissioned by her to assist in filling in the voids where needed. This is part one of a series of articles, where I will attempt to give everyone who reads this the basics of wiring an aircraft. I am a firm believer that no one learns anything by just being told something. In order to fully understand what a student needs to do, the teacher must impart to the student why a certain thing is done so that it makes sense to the student. In that way, the information is fully understood and the student gets a background in the subject that can be used as a basis for making sound judgments when an unusual situation arises in the subject area. This I will attempt to accomplish. This will be a multi-part article that may not appear every month. So, if you don't want to hear about aircraft wiring in all of its details, write an article yourself and get it to Donna.

## Part 1

In order to understand aircraft wiring, first, I must impart some basics about electricity. This may seem very simple to some, but to others it is a mystery. I would be remiss if I did not start at the beginning.

### BATTERY PRINCIPLES

1. *Here, we will only be dealing with 12 volt batteries.* You will notice in catalogs, that they list accessories, radios, etc. as 14 volt or 28 volt. Consider anything as 14 volt to be the same as 12 volt. This makes it a little easier to understand. We will not even consider 28 volt systems, since this is the realm of larger commercial aircraft and expensive singles. The aircraft industry likes to use the 14 volt designation since this is the high side of voltage calculations. It allows them to use a slightly smaller wire size (gauge) in some cases to save weight. We will do all calculations at 12 volts, as this gives us a margin of safety in sizing things.

2. *Batteries have a plus (+) side and a minus (-) side and the two sides of the battery must be connected together somehow to create the power needed to do work.* A standard 12 volt lead-acid battery is made up of 6 cells. If you look at a battery, it will have 6 tanks (cells) that hold the acid. This process gives us about 2 volts per cell, which times 6 cells yields 12 volts. If we just connect a wire between the plus side of a battery and the minus side, the wire will get very hot, melt, start a fire, and could explode the battery. Therefore, we need something called "resistance" in the wire to use the power of the battery, yet not blow it up or burn up the wiring, the plane, etc. We do this by having parts that do the work that have resistance. The less resistance, the more power is used. Conversely, the more resistance a device has, the less power is used.

3. *The amount of power used is called wattage.* Have you ever noticed that when you have light bulbs in the house that the 100 watt bulb is brighter than the 60 watt bulb? Well, this means that the 100 watt bulb is doing more "work" than the 60 watt bulb. Therefore, it uses more power. Typically, for instance, the wingtip lights on an airplane are rated at 15 watts. A landing light is typically a 100 watt bulb. Logically, we can deduce that the landing light will use more power than the wingtip light and more "juice" (current) will be used from the battery.

4. *The term "current" is in Amps and is what we basically use to figure everything out.*

Current is just what it sounds like. A current. It 'FLOWS' through the wire to produce the power needed. I hate to do this, but I am going to take you back to junior high school for a moment and give you an equation that relates 3 major items when working with electricity.

Power= AMPS X VOLTS      which means Power (Watts) equals Current (Amps) times the voltage. Conversely, Amps = Watts / Volts

If we take our simple landing light bulb above, we know that it is a 100 watt bulb. How much current would it use from our 12 volt battery? Divide 100 by 12.

AMPS = 100 Watts / 12 volts      which when we calculate it comes out to 8.33 Amps

Now, that wasn't too hard, now, was it? How about the 15 Watt wingtip light? You figure it. Answer: 1.25 Amps

NOTE: You will need to be able to figure out things like this. Parts that you will use in an airplane are either listed in Amps at 12 volts, directly, or they will just give a watt value and you will have to calculate the amps. Learn this well, since we will be using AMPS a lot later.

(Cont'd page 5)

# The Hollywood Hunks of Yesteryear loved the USA

In contrast to the ideals, opinions, and feelings of today's "Hollyhunks" the real actors of yesteryear loved the United States. They had both class and integrity. With the advent of the World War went to fight rather than rant against the country we all love. They gave up their wealth, position and fame to become military men and women, with many simply "enlisted men". This page lists a few, but from this group came more than 70 medals in honor of their valor, spanning from Bronze Stars, Silver Stars, Distinguished Service Cross, Purple Hearts, and one Congressional Medal of Honor. While many of the "Entertainers of 2003" have many expressed their "anti-American" and "Anti-Bush" messages in public, let's see what the entertainers of 1943 were doing.



Ernest Borgnine was a US Navy Gunners Mate 1935-1945



Charles Durning was a US Army Ranger at Normandy earning a Silver Star and awarded the Purple Heart



George C. Scott was a decorated U.S. Marine



Eddie Albert was awarded a Bronze Star for his heroic action as a US Naval officer aiding Marines at the horrific battle on the island of Tarawa in the Pacific, November 1943



Audie Murphy, 5'5", and 110 lbs, was the most decorated serviceman of WWII. He earned Medal of Honor, distinguished Service Cross, 2 Silver Star Medals, Legion of Merit, 2 Bronze Star Medals with "V", 2 Purple Hearts, US Army Outstanding Civilian Service Medal, Good Conduct Medal, 2 Distinguished Unit Emblems, American Campaign Medal, European-African-Middle eastern Campaign Medal with One Silver Star, Four Bronze Service Stars, One Bronze Arrowhead, WWII Victory Medal Army of Occupation Medal, Armed Forces Reserve Medal, Combat Infantry Badge, Marksman Badge with Rifle Bar, Expert Badge with Bayonet Bar, French Fourragere in Colors of the Croix de Guerre, French Legion of Honor, Grade of Chevalier, French Croix de Guerre With Silver Star, French Croix de Guerre with Palm, Medal of Liberated France, and Belgian Croix de Guerre 1940 Palm.



Jimmy Stewart entered the Army Air Force as a private and worked his way to Colonel. During WWII, Stewart served as a bomber pilot, leading more than 20 missions over Germany, and taking part in hundreds of air strikes during his tour of duty. Stewart earned the Air Medal, the Distinguished Flying Cross, France's Croix de Guerre, and 7 Battle Stars during WWII. In peace time, Stewart continued as an active Air Force reservist, reaching the rank of Brigadier General, before retiring in the late 1950's.



James Doohan (Scotty of Star Trek) landed in Normandy, with the US Army on D-Day



Clark Gable enlisted as a private in the AAF on 8-12-42. He attended OCS school in Miami Beach, FL and graduated as a second lieutenant on 10-28-42. He then attended aerial gunnery school and was assigned to the 351st Bomb Group at Polebrook where he flew operational missions over Europe in B17's.



Charles Bronson was a tail gunner in the Army Air Corps.



John Russell enlisted in the Marine Corps in 1942. He received a battlefield commission and was wounded and highly decorated for valor at Guadalcanal.



Tyrone Power (an established Movie Star when Pearl Harbor was bombed) joined the US Marines, was a pilot fling supplies into, and wounded Marines out of, Iwo Jima and Okinawa.

# What's Going On

**July 29-Aug 4, 2003**—AIRVENTURE 2003  
**August 9, 2003**—Chapter Picnic  
**August 22-24, 2003**—Replica Fighters Fly-In weekend, Osceola.  
**August 25, 2003** — Chapter Board Meeting 7:00 pm  
**August 24, 2003** — Fly-In Breakfast. 7 AM to Noon. Pilots in command free. Displays and parachuting. Iowa City Muni. Airport, Iowa City, IA Info: 319-338-9222  
**August 27-Sept 1, 2003** — Blakesburg, IA Reunion of Travel Aires with the AAA/APM International Fly-In at Antique Airfield.  
**September 20, 2003** — Fly-In breakfast and air show. Breakfast: 6:30 AM to 10 AM. Pilots in command free. Southeast Iowa Regional Airport, Burlington, IA Info: 319-754-4601  
**October 16-17, 2003** — Annual Aviation Conference, Marriott Hotel, West Des Moines, IA Info: 515-239-1691

## US Civil Aircraft Inventory

<b>Total Active Civil Aircraft:</b>	<b>233,533</b>
<b>General Aviation:</b>	<b>214,388</b>
<b>Air Carrier:</b>	<b>19,145</b>
<b>Single Engine Piston:</b>	<b>151,640</b>
<b>Multi-Engine Piston:</b>	<b>26,900</b>
<b>Turboprop:</b>	<b>9,476</b>
<b>Turbojet:</b>	<b>14,710</b>
<b>Rotocraft:</b>	<b>10,027</b>
<b>Experimental:</b>	<b>20,780</b>

## Currently Active Certified US Pilots

<b>Student:</b>	<b>86,887</b>
<b>Recreational:</b>	<b>318</b>
<b>Private:</b>	<b>261,927</b>
<b>Commercial</b>	<b>137,636</b>
<b>ATP</b>	<b>146,989</b>
<b>Instrument Ratings:</b>	<b>315,276</b>

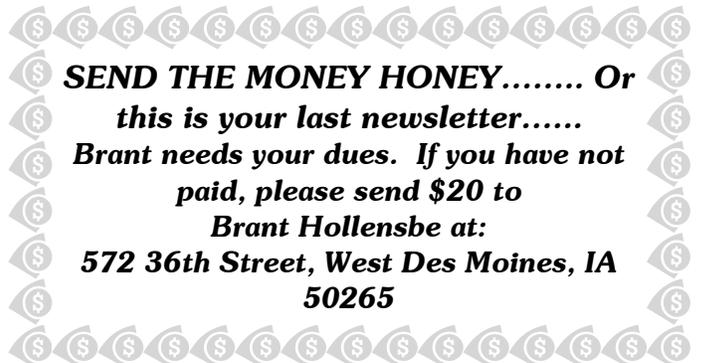
(Wiring cont'd from page 3)

5. *Wires are rated in AMPS, and we must **ALWAYS** use wiring to a device that has a higher amp rating than the device itself.* In our example with the 100 watt landing light, we need to have wiring capable of, at least, 8.33 Amp rating Therefore, would, probably, use a wire with, at least, a 10 amp rating. We would **NEVER** use a wire to operate the light which only had, say for instance, a 5 amp rating.

6. *Get a copy of the FAA/DOT book AC 43.13 latest revision. "Acceptable Methods techniques, an practices AIRCRAFT INSPECTION AND REPAIR." Chapter 11.* This is the bible for everything that you will be doing when wiring an aircraft. Remember, I am just providing some guidelines as to how to understand aircraft wiring. In all cases, check the FAA publication for proper techniques and practices. This book can get pretty complex and in depth. I will try to simplify some of the tables and charts and give you some basic standard guidelines that will keep you out of trouble. I have no intention to try and save the last 1/10<sup>th</sup> of an ounce of weight with wiring. In some cases, I will suggest that the wiring be larger than the optimum that can be gleaned from the pages of the AC 43.13. I will attempt to give you reasons why I might suggest a larger gauge than optimum in many cases.

7. *Plan your wiring at the beginning of your project. Don't let it be an afterthought.* Many people are afraid of wiring, since they don't understand it. Therefore, they, kind of, leave it to last or put it off, thinking that they will deal with it later. If you do that, you will just make matters worse. You might close up something where you need to put some wiring, leave out some mounting locations, etc

Because of schedules, Hartman work will not be going on for a while. We will update you when the work parties begin again.


  
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# PROP WASH

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