Rotorcraft
Official Publication of the Popular Rotorcraft Association

In This Issue:

3 Dashboard Fuel Gauge Installation
6 Rotors Over The Rockies 2012
8 PRA 2012 Elections - Meet the Candidates
12 PRA Board of Directors Election 2012 Official Ballot

Article Submissions
Rotorcraft welcomes your submissions pertaining to fly-ins, builds, upcoming events, and any other items regarding the world of rotorcraft.

Deadline for submissions is the first of the month. All articles, photographs and information should be emailed to Editor@PRA.org.

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On The Cover:
Michael Burton flying a Calidus gyro over Mentone, IN at the 2011 PRA International Convention.
Photo by Tim O’Connor.

Rotorcraft makes every attempt to provide accurate information. Views, opinions and statements expressed are not necessarily those of this publication. Rotorcraft reserves the right to edit material that is submitted and the right not to publish material that is deemed detrimental.
When I attend a fly-in and fly to another airport for breakfast or on a cross-country flight, I always have some anxiety about my fuel level. With a seat fuel tank it is not possible to twist around in the seat and view the fuel level tube on the left side of the seat. I decided to investigate the possibility of installing a fuel sending unit in the seat tank and a fuel gauge on the dashboard.

As I began investigating fuel sending units, I learned there are three different types. They are:

- **Float arm type** - This type has a vertical arm that descends into the fuel tank with a horizontal arm with a float. The float arm moves with the varying fuel level providing an indication of the fuel level to the fuel gauge.

- **Capacitance type** - This unit has a metal rod inside of a metal tube. The fuel flows inside the tube between the tube and the rod. The fuel acts as link between the metal tube and rod providing an electrical impulse to the fuel gauge.

- **Rod type** - This sending unit is a rod with a small black donut float. The float rises and falls with the fuel level and provides an electrical impulse to the fuel gauge.

The float arm type would not work with the dimensions of my seat fuel tank. The capacitance type unit had a maximum length of 18 inches which was too short. The rod type unit was available in different lengths. I selected a 24-inch length SSS/SSL model sending unit from WEMA USA (www.wemausa.com). See Figure 1. I also selected an analog fuel gauge catalog number UPFR-BB from WEMA USA (Figure 2). It is important to purchase the fuel sending unit and the gauge from the same vendor to prevent any electrical compatibility issues. WEMA USA also provided installation instructions on their website and with the delivered product.
The instructions were simple and easy to understand.

I have a Dominator single-seat gyrocopter. The dashboard components are wired directly to the various wires from the engine, radio, strobe lights, etc. That makes moving components on the dashboard to accommodate the new fuel gauge almost impossible to do while the dash is connected to the gyroplane. It became clear that the dashboard had to be disconnected from the gyroplane. I took the first wire and put two pieces of blue painters tape on the wire, writing a ‘1’ on each piece of tape. I cut the wire between the two pieces of tape. The process was continued for each wire until the dashboard was disconnected.

A chart was also prepared identifying the connections and the numbered wires.

The WEMA USA fuel gauge utilizes three wires: one to 12 volt power, ground, and to the fuel sending unit.

To make it easier to remove the dashboard in the future, I purchased four trailer connectors from Wal-Mart. The idea was to connect the male end of the trailer connectors to the dashboard components and the female connector to the gyrocopter end of the various wires. Using brightly colored paint, the male-female ends of each connector pair was identified by dots (1 dot, 2 dots, etc.) The male end with 1 dot was matched to the corresponding 1 dot female end. There were four colored wires (brown, white, green, yellow) coming out of each male and female connector. Each of the dashboard wires was replaced using ring terminal connectors to connect a wire from the trailer connector (Figure 4).

I took painters tape and covered the dashboard components and gave it a couple of light coats of black spray paint. Using a label maker, new switch labels were added to the dashboard (Figure 5).

Back at the gyrocopter, a wire was run through the cable conduit from the mast area to the rear of the dashboard. This would be the wire between the fuel sending unit to the fuel gauge in the dashboard. Using the connector wiring guide, the female end of the trailer connectors were matched to the appropriate wires from the cable conduit. This would complete all of the connections to both the male and female end of the trailer connectors. Mate both ends of the trailer connectors and re-connect the dashboard mounting screws.

Be sure to remove the seat cover from the seat tank. I made the mistake of trying to go through the seat tank cover and the result
was a larger hole than was necessary. The fuel sending unit will be placed on the pilot’s right side of the seat tank in approximately the same position as the fuel fill port on the left side of the tank (Figure 6). Using a 1 1/4 inch hole cutting saw bit, drill a hole in the top of the seat tank. The hole needs to allow the float on the fuel sending unit to clear the internal sides of the fuel tank. There is a molded center brace in the middle of the seat tank that must be avoided.

Using the top mounting plate of the fuel sending unit as a template, drill the five mounting holes with a 3/16 inch drill bit. Use 10-32x1 inch screws for the mounting bolts (I used brass to eliminate the possibility of sparks) and 10-32 brass hex nuts. The mounting screws will need to be placed through the 1 1/4 inch hole from the inside of the tank up through each of the five mounting holes. Use a small gauge bare wire wrapped around the screw threads to keep the screws from falling back into the tank.

Insert the fuel sending unit into the 1 1/4 inch hole and align the mounting holes with the screws. Place the 10-32 nuts and washers on each of the mounting bolts and remove the bare wires used to keep the bolts from falling into the tank. Since you cannot get a screwdriver inside the seat tank to hold the bolts, use a pair of pliers to hold the top of each screw while using a wrench to tighten the bolt. Use care to not damage the threads with the pliers.

Replace the cover on the fuel tank. There are two lead wires from the fuel sending unit that must be run through a small hole in the top of the seat tank cover above the fuel sending unit. The two lead wires are pink to the fuel gauge and black to ground. Run the ground wire to a screw on the mast.

As long as the float on the fuel sending unit is positioned so that it moves freely, the sending unit and gauge should work properly. Because the seat tank contains most of the fuel in the bottom section of the tank, there will not be the correlation of fuel to the quarter mark indications on the fuel gauge. You will have to test the various levels of fuel in the tank and see how the gauge reads. Make your own indicators on the gauge for the number of gallons of fuel in the tank.

When I began this project, I knew it would not be a perfect solution to the amount of fuel remaining in the seat tank, but I wanted to see if I could make a fuel sending unit and gauge work with a seat tank. I took my gyro to Benson Days in Wachula, FL and I found an even simpler method to indicate fuel levels in a seat tank by seeing the gyro owned by Johnny Hay from Cincinnati. He fed a fuel line from the bottom of his seat tank to a gauge that measured the inches of water (in this case fuel). The weight of the fuel in the seat tank supplied the readings to the gauge. Simplicity is always the best and least expensive solution. Visiting fly-ins enables you to see what other pilots have done to fix a problem or make an improvement to their aircraft.
By Doug Barker – URA President

I know we traditionally get articles about events after they are over with pictures to show how wonderful a time was had by all that were able to attend. However, I wanted to get an article in the Rotorcraft E-Zine about Rotors Over the Rockies before it was over, in hopes that some reading this article might make the decision to come join us. That way, they can be part of this great event rather than part of the crowd that says, “I wish I had known about that. I would have loved to have been there.”

Rotors Over the Rockies will be held at the Brigham City, UT airport, on June 7th, 8th & 9th. Brigham City, UT is located just North of Salt Lake City, UT and is located right in the center of the Western half of the U.S. So it is situated within a days drive of about half the country. The Brigham City Airport is a very nice facility with a 7,500x100 foot runway and hangar space available to keep our rotorcraft in. Camping is available (no hookups) at no charge on the airport grounds and hotels and restaurants are available within a five-
minute drive. The elevation is 4,229 MSL so be prepared to be flying in a density altitude of 5,000 ft and potentially exceeding 7,000 ft. There are beautiful mountains that can be explored within five miles of the airport and plenty of sparsely populated country that is safe to fly over at low altitude (in class G airspace).

ROTR normally has a great mix of Rotorcraft (both gyros and helicopters), everything from original Bensen Gyros and old Vancraft machines to the two-place RAFs and Sparrow Hawks, and the new Calidus will be there. You will also get a chance to see the turbine-powered Hawk 4 from GBA. There will be Dominators, AirCommand, Butterflies, Gyro Bees and Honey Bees (G-2) at the event this year. Plan on staying until the end, and join us at our closing banquet for good food and awards and good friends. Life just doesn’t get much better than this!

There will be several two-place machines that a newbie can get an introductory ride (or training) in. There will be multiple gyro CFI’s there, as well as helicopter CFIs, so if anyone has a fixed wing, private pilot license now and wants to get a Sport Pilot gyro rating by getting two CFIs to sign you off, it can be done at our event. We also have a DAR that can do machine inspections if you want to bring your machine early and get an airworthiness inspection or an annual condition inspection on this trip. We will have two gyro CFI’s doing training and flight reviews. Jim Fields will be flying his G-2 Trainer and doing introductory rides. If you are new to the sport and want to see what it’s really like, this is the best opportunity you will ever have (west of the PRA Convention at Mentone, IN).

We would love to see more of our brothers from the Eastern half of the country come out and join us this year. We realize that will be a long drive and a long way to bring a machine, but we offer incredible scenery, great facilities and a great bunch of rotorcraft enthusiasts to share the experience with. Come out and join us! I can guarantee you will be glad you did!
PRA 2012 Elections - Meet the Candidates

There are three board seats open in this year’s election, which will be filled either by candidates who have been through the nomination process, or write-in votes. To be eligible, write-in candidates must be members in good standing of PRA for at least one full year at the time of the election.

Two candidates, one an incumbent and the other a newcomer, have sought these seats through the nomination process, and thereby earned the opportunity to submit candidate statements for this issue of Rotorcraft. They’ve also been asked to answer some basic issues-based questions, to give voters a better understanding of their positions and philosophy. Their statements are below, and a ballot follows.

Desmon Butts

I have been around aircraft from a very young age. I first saw gyroplanes in a James Bond movie and thought, “Wow, that’s cool!”

I could have gotten my license for free, but did not until I turned 40. I was trained in Alaska in fixed wing and multi-engine commercial. I was living in Alaska, north of Anchorage and flew my 172 over glaciers and Prince William Sound. In 2009, I took my wife to Costa Rica for our anniversary. We stayed at the Flying Crocodile ultralight port. Guido, the owner, had 5 MTO Autogyros. I did not fly a gyro at that time. Three months later after selling a company in Alaska, I moved my family to Costa Rica. We stayed again in a large house at the Flying Crocodile for four months. Our front door was 30 feet away from the runway, with gyros flying everyday. It took me six weeks of observation before getting into one. Then the addiction began!

I was licensed in Costa Rica and came back America. I picked up my Sport CFI in 2010, Commercial Gyro in 2011, and finished Full Gyro CFI in February of this year. I now live in Tomball, Texas, north of Houston.

I have my own MTO sport autogyro and have flown over 500 hours in gyros in 10 months, including flying from Houston to Oshkosh last summer. I have gone through the process of getting my LODA from start to finish.

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to finish. I have also flown and trained in several gyros.

I feel that I can offer a unique perspective in our field and also have been asked by the FAA to help with safety standards. I have been involved some in using gyros in police units. I understand the practical use of them in our economy and public use.

It is time to move this aircraft to the next level with improved safety, training and education. I have a very simple, but well put together, type of training that can be used as a model to help others in their training programs. I will spend time helping many who have expressed the lack of support in this field.

Thanks for your consideration.

What are the major challenges facing the growth of the Personal Rotorcraft sport, and what can the PRA do to address them?

1. Lack of ready information or false information for newcomers.
2. Making available safe training that is mobile if need be. Better access to CFI.
3. A strong public presence at airshows. This means doing performance flights, not just static displays.
4. Showing a very organized committee to the FAA on all levels. This will help things move forward.
5. Backing good brands -- not for promotion but for safety. Post an unbalanced list of grades and publish it. For example, set a performance list then grade several gyros and post the results.
6. If possible, have a PRA registered aircraft log or a way to have sellers and buyers be able to check aircraft before the buy. It might be PRA certified!

Assuming budget was not an issue, what would you most like to see the PRA accomplish in the next year?

Get in front of every news event that you can. Bring on the media, in a good light, of course. Send out press notes of successes. Sponsor events to help the public and talk about it.

Have a booth at airshows in states across the country. Ask for local members to help in these. Get pilots CFIs with LODAS to perform flights at them for a donation for local charity. This gets good press. We all want good press.

What uniquely qualifies you to help administer and grow the PRA?

I have flown gyros in all kinds of weather and places. This year I have flown over 500 gyro hours in 10 months, from 103f above to -12f below. I have crossed the U.S. from Washington DC to Florida in winter at 6500 ft. the Houston to Osh Kosh last summer. I have preformed over 350 training hours to others and met hundreds of people interested in gyros. I am a full gyro CFI and commercial gyro in Costa Rica. I used to own a marketing company and produce my own training videos and lessons. I understand what it takes to offer information to take things to the next step. I have offered many people free time and help. In the last 1-1/2 years I have done over 100 hours of free ground time and 50 hours of free flight time.

I have gone through the LODA process and understand how it is done. I know how to make the gyro flying experience a fun, exciting and safe one.

I train gyro full time and fly to my students any place they might be.

What’s the best thing members can do to help the PRA succeed?

Have patience and support the local groups. Do not get hung up on the small stuff. Offer good sound solutions. Do not take offense easily. Offer help readily and be smart enough to accept some if you know you need it. Use your talents to move things forward to be a presence in the area. Tell people who you are and what you do.

Fly in a safe manner to skillfully show your passion. Get trained, rated, and legal. Try to be united and not bicker. Be honest in what you sell, and get your stuff checked before you fly or buy. These things in many cases are local but it flows upward. Promote membership not criticism.
Doug Barker

About 10 years ago I came across an article in my EAA Sport Pilot magazine titled, “Gyroplanes for Ultralight” by Tim O’Connor. Up until that point I had been a fixed wing flying enthusiast with dreams of building a Zenith CH 701 STOL fixed wing aircraft. But after reading Tim’s recount of flying a gyroplane with descriptions like “gyroplanes are the most maneuverable of all kinds of aircraft,” and “can have the power to weight ratio of an F-16,” and that gyroscopes are not subject to stalls and spins and can land in very tight spaces with zero ground roll, I was converted. From that time forward, I have devoured everything I could learn about gyroplanes. I quickly learned about the PRA organization and searched for a local chapter where I could join to find others in my area that could help me on my quest to fly a gyroplane. However I found that there wasn’t a PRA chapter within 500 miles of where I lived. Rather than let that stop me I kept looking for others in my area that shared my interest in gyroplanes and eventually found a handful of others who had expressed a desire to learn more on the subject. Eventually, I had collected enough names that I thought we could join together and form a new PRA chapter in the state of Utah, and that is exactly what we did. I am one of the original founding five members who created the Utah Rotorcraft Association (PRA chapter 2).

I wanted to find others who knew more about gyroplanes than me and were willing to share that information with me, but we all seemed to find ourselves in about the same boat. So since I was the person instrumental in getting our group together to form a PRA chapter, I was elected the President of our new little chapter. For the last six years I have served as President of our local chapter and been a part of the incredible growth that our organization has accomplished. We have formed a 501 c3 non-profit organization, and been instrumental in starting a regional newsletter “Western Rotorcraft” that is constantly growing in readership. Our organization has drawn members from 11 states and is on the cutting edge of showing what a chapter can do to reach out and grow our sport. Along the way, I have started building a Butterfly Super Sky Cycle and become a dealer for the Butterfly line of gyro.

What uniquely qualifies you to help administer and grow the PRA?

I am very committed to growing the world of gyroplane enthusiasts and have been active in making presentations to groups both locally and across the U.S. whenever the opportunity presents itself. For the last two years, I have served on the National Board of Directors for the PRA. If you feel I
have been of value in that position, I would be happy to run again and fill another term.

What are the major challenges facing the growth of the personal rotorcraft sport, and what can the PRA do to address them?

One of the biggest challenges we face to growing our sport is the serious lack of gyro CFIs. It is such a major commitment to take a week off from work and travel for hundreds, if not thousands, of miles to get time with a CFI to learn to fly gyros. And it typically takes more than one trip to make that happen. Today, only the really dedicated people are able to pull it off. While that has some advantages in weeding out those who are less serious about joining our group, it is also holding us back from the quick growth that we could otherwise be experiencing. I fully support Scott’s initiative to build a program that can help create new full time gyro CFIs as long as it is administered in a way that creates CFIs in a geographic location where we most need them.

What’s the best thing members can do to help the PRA succeed?
The key to growing the PRA is for everyone to simply take a part in making that happen. We cannot sit back and expect someone else to do the work. Most of the work will be done on the local level in our local chapters.

Assuming budget was not an issue, what would you most like to see the PRA accomplish in the next year?
We have each got to help spread the word and invite new people to attend our chapter meetings. We need to find ways to get them up in the air so they can experience the magic of flying in a gyro for themselves, and the gyro will take care of the rest. Flying gyros is the most exciting activity I have ever participated in. We just need to quiet keeping it a secret and let the word get out. Each of us have different strengths, but if we will simply do what we can and work together, it will be enough.

I’ll be at the PRA’s 50th convention -- come look me up and let’s become friends. Let me know your ideas on how the PRA needs to grow and I will fight to see that it happens.
POPULAR ROTORCRAFT ASSOCIATION
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[  ] Desmon Butts  [  ] Doug Barker

[  ] Write-In _____________________________________________________

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Does anyone in your party need special consideration?  Yes/No  Specify: ________________

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