



NARCA Eagle

Volume 2016-08
August 2016

North Alabama
Radio Control Association
P.O. Box 173
Harvest, AL 35749
<http://www.flynarca.com>



Next Meeting

Place: Epps Airpark, Harvest
Date: Thursday August 11, 2016
Time: 6:30 PM
Program: TBA

Upcoming Club Events

August 13 - Monthly Aerotow, Epps Airpark

Eagle Droppings From the President:

The dog days of summer are definitely here. It is brutal outside. Despite that it's good to know people are getting some stick time. I actually managed to build a plane and, wonder of wonders, it flew. And landed!

I am happy to welcome Dick Novak back as a honorary member. Dick was a member for a number of years and had some major health issues just under 3 years ago. He's doing lots better and wants to stay connected with the club even though he doesn't feel he's up to flying any longer. Hopefully he'll be joining us from time to time to enjoy the social aspects of our group. He has had some VERY interesting aviation experiences in his past and he's happy to relate them.

It's getting to be time to start planning winter and spring events, and input from the membership is welcome. Larry has said he's happy to host the Christmas dinner at his house again unless a more popular option presents itself. This past Christmas dinner was very enjoyable and fairly well attended. The advantage of a private residence is that you actually get a chance to talk with everyone you would like to.

Right now it looks like the Swap Meet will be the first weekend in April. Toledo is scheduled for the 2nd weekend and if we schedule at the same time it will probably draw off a lot of our larger vendors. Larry would also like to have someone understudy him on the swap meet so get in touch with him if you would be willing to learn about it.

That's all I can think of for this month - see you at the field! →

Rick Nelson, President

14 July 2016 General Meeting Minutes

Meeting called to order by President Rick Nelson at the NARCA flying site (Epps Airpark) at 6:35PM.

Members present: Stan Stanford, Cliff Lanham, Rick Nelson, Kevin Reynolds, Larry Holcomb, Charles Hensley, Bill Beasley, Rich Lawrie, Don Apostolico, Jerry Conrad, Chuck Pierce.

There was great flying prior to the meeting after the storms came through.

Minutes of previous NARCA General Meeting were approved as published in the NARCA Eagle Newsletter.

Officers' Reports

- Vice President – Tim Batt. Absent.
- Secretary – Archie Phillips. Absent.
- Treasurer – Bob Stewart. Absent.
- President – Rick Nelson. Information about a local t-shirt printer to be presented in new business.

Old Business

- **There was a second NARCA vote for Don Apostolico.** Motion for full membership passed on written ballot. Welcome to Don as a NARCA member with full privileges.
- **There was a second NARCA vote for Bic Green.** Motion for full membership passed on written ballot. Welcome to Bic as a NARCA member with full privileges.

New Business

- **Local T-Shirt Printing Company.** Rick talked about a neighbor who professionally creates t-shirt printings and the possibility of printing items for

NARCA. The cost appears to be significantly less than Café Press. There was discussion of the types of printing available; Rick will do some more research to find out what is available from this company.

- **Marker Flags at the North End of the Runway.** Rick discussed the possibility of moving the flags with Mr. Epps. The ones on the east side straddle the drive making it difficult to drive through with long vehicles / trailers. He said that the flags could be moved as long as they are not on the runway.
- **Swap Meet.** Larry Holcomb reported that the swap meet will be held the first or eighth of April, depending on the date chosen for Perry.

Meeting Adjourned at 7:07 PM.

No program was presented. →

*For the Secretary,
Kevin Reynolds*



George, Larry, and I took a road trip to Oshkosh to see what all of the excitement was about regarding the EAA show. On the way we popped into the AMA headquarters in Muncie to watch a few hours of sailplane and FF Nationals competition and went through the museum. Possibly not worth a dedicated trip from here to see, but well worth stopping by if you're anywhere close.

AirVenture is worth the trip. As we were passing the airport heading for our overnight location several L-39s and a pair of T-33s departed passing over the interstate at well under 100 feet. A few minutes later getting near the campground a very loud roar started and got louder. It lasted for about 20 seconds and by twisting my neck into a pretzel I spotted a pair of Phantoms heading for the field. I didn't know there were still two of them flying and for me seeing them was worth the trip. While setting up for our stay a Ford Tri-motor kept flying over. I found out the next day the EAA has a pair of them giving rides.



A WWII formation flew over a dozen times, consisting of a B-25, P-51, F4U, F4F, P-40, and Spitfire.



The sound was magnificent!

The show itself is a mob scene. Almost any private plane you have ever heard of is represented, and lots of military. We saw an A-4, F-86s,



MiG-17, a dozen Mustangs, B-25s, B-17, TBF, Birddogs, C-123, and, of all things, a Yak-9. Current military hardware was parked across the field except for a few on static display, but to my dismay the Phantoms had left the building.

The flying display was good but a little lackluster to me. There were 4 excellent aerobatic demos each day,

a military fly-by with quite a crowd of hardware, and the obligatory heritage flight. Fifi flew by one day at about 2,000 feet. One day had an F-18 demo, the next had an F-16 demo. Friday the Hawaii Mars gave a show



and we found out Saturday it made an emergency landing in Lake Winnebago and got holed on something in the water, so no Saturday demo. The Canadian Snowbirds flew their usual excellent show. We planned on staying for the night show Saturday but were too worn out. The Aeroshell team has some kind of pyrotechnics on the planes and from the campground they looked like comets doing aerobatics.

If you want to see Oshkosh sooner is better than later, if only because of the energy requirements to walk the entire show. The long runway is 8,000 feet and planes are parked up to 10 deep the entire length, and then there's the booths that extend almost as far. Lotsa hiking, lots to see, and a whole lot of people. I don't have this year's numbers, but one lady said Saturday was the biggest crowd she had seen in 30 years of attending. Like I said, worth the trip.

Rick



**Don's
Flight Tip #7**

In Flight Current Readings

Earlier flight tips covered setup of linkages and the use of current meters to measure and eliminate preload on control surfaces and the resulting high current draw, short battery life and brownouts.

I finally found and unpacked some moving boxes that I have been looking for that had my flight test data regarding inflight current draw. I want to share this data with the reader to complete the story on facts and myths

related to the causes of high servo current flow and brown outs so often blamed on factors other than their true cause. I know you will find the data interesting and informative and this knowledge will create a better understanding and awareness of the subject. You will then be able to discern for yourself who to trust for information when you read opinions on the net or in the magazines. Simply asking the individual a few key questions that you now know the answers to will quickly tell you whether the opinion is informed or just an opinion. There are a lot of uninformed opinions and widely held beliefs that are simply incorrect. So here's the rest of the high current flow story.

When I owned **Don's Hobby Shop** I took many calls or visits from modelers who were convinced they *needed* 16 gauge wire and giant heavy duty connectors on their high performance gas or glow IMAC or giant scale aircraft, to carry high current generated by high powered digital servos. Customers would unnecessarily want to spend hundreds of dollars, purchasing power isolation devices, *to keep their receiver from burning out due to the high current flow from operating all those power hungry digital servos.* *Let's pause for a moment and think about that popular belief.*

Imagine a manufacturer selling a 10 channel receiver that you can only plug 6 servos into or you will burn out the receiver. That's obviously ridiculous and think of the manufacturing liability if that were true. I can't tell you how many times I heard that from modelers who saw that on the net or the local expert said they needed power busses to isolate the receiver from the high servo current flow. While it's not wrong to use these expensive products, which have some neat features, it is simply not necessary *providing the plane is setup properly.* Please refer to Flight tip 4 and 5 to review modeler setup errors that cause high current flow and brownouts.

Regarding receiver current flow limits - Years ago I called Futaba, JR, Spektrum and Hi Tec to get the current ratings of their name brand receivers. The smallest major brand 4-6 channel receivers on the market at that time had a current capacity of at least 10 amps. The larger major brand 7-12 channel receivers were rated at 20-50 amps depending on the receiver. To put that into perspective, your house typically uses 15-20 amp circuit breakers so if your toy plane is drawing enough amps to burn out your 10-50 amp rated receiver, your airplane is already on fire and it's not the receivers fault.

(Electric planes run higher amperages to the motor but the airborne system uses regulated voltage to the servos

and receiver, just like any other airplane.)

Improper setup will still cause high servo current draw on electric planes with the same problematic results of damaged or burned out servos or brownouts.

The limiting factor for max current flow is not the receiver but the wiring and connectors because the servo extension cords and connector ratings are typically less than the receiver ratings. Except for the power leads on an electric aircraft providing high current flow to the motor system, that's not a problem if the aircraft is setup properly.

The standard setup for years on giant scale with digital servos was 22 Heavy Duty gauge wire with dual batteries, dual switches and many including myself flew dual receivers for additional safety. This setup works fine on planes setup properly.

When someone would call my store to order unnecessary items *due to the high current draw of their digital servos* I always asked questions such as: Did you use a current meter to setup your servos – How much current does your airplane draw on the ground and in flight? I wanted to learn from them if they knew what they were talking about. In almost 20 years of asking questions to thousands of modelers the answer was **always** – No or UHHHHH I don't know or my buddy said I "needed -----".

I asked these questions as I was concerned not only for the safety of the plane, I didn't want to give out bad advice, resulting in someone getting killed or hurt because of my advice. My formal training as a certified *FAA Airframe and Powerplant Technician* and a *licensed FCC second class Radio telephone operator*, taught me to *never guess but measure*.

In the very early days I didn't know the answer to my own questions nor did **any** of the manufacturing tech experts I called. I was surprised to find out they didn't know either so I set up a test to learn the answers. *I had one major manufacturer who told me the average current flow on a large plane was 20 amps.* I knew that info was wrong as soon as he told me because the heavy duty standard connectors are rated for 5 amps constant current and 8 amps spike load so if he was right the average of 20 amps of power would melt the extensions and connectors. You will see from the test data that the info he provided was completely bogus, but he was the tech expert for one of the leading radio manufactures in the world and you would think that if they put out info like that it should be accurate. As you will see from the data below, his answer was not even close to actual fact.

To see what the current readings were on a typical setup my friend and I installed a *very expensive* recording device that he borrowed. We moved it from plane to plane that measured in flight voltage and current readings. Hopefully I wouldn't toast the plane and have to pay for that expensive meter. HA! We did this test on the 3 popular sizes of planes with typical radio setups – A 40%, a 35% and a 25% size plane. The planes were all setup with recording meters and the aircraft linkages and radio setup was as described in flight tips 4 and 5.

I flew a preplanned flight profile and performed specific maneuvers at prescribed times in the flight to be able to compare results from plane to plane. The maneuvers were a blend of IMAC and 3D maneuvers. For example at the 5 minute point we performed a blender. At the 5 minute 30 second point we performed a double full power snap on the upline. At the 7 minute point I performed the waterfall maneuver etc. You get the idea. During the testing we learned the blender consistently drew the most spike load current. The first plane tested was a 41 ½ pound 40% Carden Extra 330 with 3W 150 on quiet cans and 13 JR 8611-8411 digital servos. Here are the results:

FIRST AIRPLANE: 40% Carden Extra 330 3W 150 on quiet pipes, 41 ½ pounds, 13 digital 8611-8711 servos.



IN FLIGHT CURRENT FLOW:

- ***Idle current on the ground - 200 mah***
- ***Peak load during a blender 6.5 amp spike load for 1/2 second***
- ***Voltage was constant due to regulated voltage at 6V***
- ***Average load during flight - 2.8 amps***

SECOND AIRPLANE: 35% Extra 300S, 26.5 pounds, 8 JR 8411-8611 digital servos.



IN FLIGHT CURRENT FLOW:

- *Idle current 155 mah*
- *Peak load during a blender - 3.8 amp spike for 1/2 second*
- *Voltage was constant due to regulated voltage at 6V*
- *Average current draw during flight - 2.2 amps*

THIRD AIRPLANE: 25% Extra 300 BME 50CC 15.5 pounds, 6 8411 digital servos.



IN FLIGHT CURRENT FLOW:

- *Idle current 95 mah*
- *Peak load during a blender - 2.8amp spike load for 1/2 second*
- *Voltage was constant due to regulated voltage at 6V*
- *Average load during flight - 1.8 amps*

Now that I had this [empirical data](#), I could use it to help customers better understand the loads and appropriate equipment they needed to setup their plane. No guess work, no uninformed opinions, no misinformation from internet armchair pilots. Just solid test data that

represented the 3 most popular size large planes and setups on the market.

I could have regularly sold the more expensive equipment and said nothing to the uninformed customer but that's not right. I always tried to help my customer get what they needed and not spend hard earned money on things they didn't need. After explaining the test data most customers were thankful for the information but if the customer insisted, I sold them the more expensive equipment and went out for steak that evening instead of hamburger. HA! It's not wrong to use it, with few exceptions it's just not needed providing the plane is setup properly.

It is interesting to note that almost a decade after I performed these inflight tests and developed this empirical data JR performed and published the same type of test on a 40 % IMAC plane with almost identical results. So for a decade, while everyone else was putting out their estimates and best guesses I was putting out hard data that was tested and non-contestable.

Regarding setup let me share one story with you - To illustrate how bad some setups are. One customer came into my store with a 1/5 scale P-51 Mustang with 12 digital servos and asked me to check out the plane before the test flight. I asked him if he used a current meter to check his setup. He said the *local expert* in his club said he didn't need to. Well, let's just see if his well-meaning but uninformed friend knows what he was talking about.

Before bolting the wing on the fuselage I hooked up the servo leads to a current meter in line to check every wing servo. The 5 wing servos **generated over 4 amps** of current flow at idle sitting on the bench with no flight loads applied. Yikes! Holy meltdown as Batman would say. As you will note above, [my 40% Carden with 13 high powered 360 to 400 ounce torque digital servos draws a total of 200 mah on the ground](#). Any wonder why this customer's plane would have short battery life, burned out digital servos and brownouts? There were still 7 more servos in the plane that I hadn't checked yet.

I found that all 5 wing servos were binding due to preload or overdriving their endpoints causing high current draw. This was a crash waiting to happen due to "receiver brown out or burned up digital servos or a dead battery". Keep in mind this was on the bench with no flight loads applied. When flying the loads go up significantly as you can see from the above planes idle current versus in flight average current readings.

The 7 fuselage servos were just as bad. He bought his current meter, went home, fixed the issues before the test flight and became a believer in using a current meter to check his setup. I have numerous true stories just like this one that have caused numerous planes to crash because they were not set up correctly. While I don't want to see anyone crash my main concern is to not hurt or kill someone with an out of control plane.

Please don't think because you fly small electrics that you are immune from hurting someone. I saw an *unpowered glider* hit a pilot in the head and knock him out cold. The glider was on final approach flying at about 20 mph estimated. When struck in the head the pilot dropped to the ground like a stone. I ran out and picked up his transmitter off the ground and safely landed his plane while others called 911 to get the pilot attended to. There is a lot of kinetic energy in our aircraft that can do a lot of damage quickly.

This information presented above is directly applicable to electric planes as well as large scale aircraft. If your electric plane is drawing more than 20 mah per servo on the ground in the 3 control positions described in an earlier flight tip, you've got a problem.

Is your plane setup properly? None of us want to see planes crash or people get hurt. We all say that we are concerned about safety but have you checked your plane to insure it's safe to fly? If not, the answer is a mystery and I would refer you to my closing comment in all of my flight tips... **Fly Safe.**

It's no harder to set a plane up correctly than it is to set it up incorrectly. If your plane is not setup per Flight tips 4 and 5 your plane may be drawing more current flow than it would if the plane were setup properly. My advice is **"Be Safe - Don't guess - Measure!"**

Until next time... Fly Safe →



Yak 9



Are You Properly Securing Your Batteries Inside the Airplane?

I recently converted a Telemaster to electric power. Building a secure compartment for a 6S 5000mah battery was important due to the sheer weight of the battery. The ARF and RTF battery hold-downs seem to be pretty good but even those merit attention, so inspect closely. I ripped the gear off the Telemaster on a poor landing but the battery was ok. Still I intend to make sure that several glow to electric conversions I'm working on that will have big heavy batteries won't lose them in a violent maneuver or have the battery keep going if the plane stops suddenly. Make sure you build your compartments sufficiently strong to secure batteries. →

*Fly Safely,
Larry Holcomb, Safety*

C-123



Mig 17

