NARCA Eagle

Volume 2016-06
June 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 June 9, 2016
Time: 6:30 PM
Program: TBA

Upcoming Club Events

June 11 – Monthly Aerotow, Epps Airpark
June 18 – Open House / Fly In, Epps Airpark

Eagle Droppings From the President:

Greetings all,

My medical adventures continue so this will be pretty short. For those that have any interest my gall bladder came out last week and now they're trying to figure out is seriously wrong. As I'm pretty punky right now please refrain from calling and/or coming over. I'll eventually get to emails. I appreciate the thoughts but am very poor company. Just ask my wife.

I hope you all read last month's Model Aviation. There was a great article about the 20 year commemoration of the Pensacola model airplane field. Very positive write up and it looks like those guys are set for a long time. George Rittenhouse was a member down there when it was developed and he said there was nothing within miles.

But wait, there's more. George gave me a clipping last week out of the Pensacola paper about the field. It seems a 500 house development has gone in down the road and about 6.5% of the new neighbors don't care for model planes so the meetings in front of the city/county commissions have started. Ain't life grand.

On the positive side I got a note from Mr. Epps telling me the family's legal problems have been resolved, and he seems happy with the outcome. Of all the good news I could have passed that's the one that pleases me the most.

Take care, and I hope to eventually see you at the field. ✈

Rick Nelson, President

Membership (Second Vote) April 2016 Meeting

- Art Mansfield, Tim Batt sponsor

14 April General Meeting Minutes

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

Severe storms in the area resulted in low attendance at the meeting.

Introduction of visitors and prospective members – Dave Arterburn.

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

Officers' Reports

- Vice President – Tim Batt. Absent.
- Secretary – Archie Phillips. No report.
- Treasurer – Bob Stewart. Absent.
- President – Rick Nelson. The field is in good shape with the recent mowing. We need to replace one of the safety nets near the shade shed.

Old Business

- **There was a second NARCA vote for Tom Fleming** with sponsor Archie Phillips speaking on his behalf. Motion for full membership passed on written ballot. Welcome to Tom as a NARCA member with full privileges.
- **Budget Amendment** – There was a typo in the NARCA FY 2016 budget passed at a previous meeting. Motion was made to amend the budget PASSED by voice vote; since there was not a quorum present a second vote of the

membership is required at the next general meeting.

New Business

- **There was a first vote for Dave Arterburn with George Rittenhouse as his sponsor.** Dave is a retired Army helicopter pilot and now a professor at UAH. Approved by unanimous voice vote; welcome to Dave as a NARCA introductory member.
- **There was discussion on the new path to the flying site.** It was noted there is now gravel for the road at the north end of the runway.

Meeting Adjourned at 7:45 PM.

After the meeting for "Show and Tell" Rich Lawrie presented the world's ugliest Chance-Vought Corsair (you should have been there)

Respectfully Submitted,
Archie Phillips, Secretary

New Path Around the North End of the Runway

As you know, 300 feet of runway on the north end was sold off and is no longer accessible. This resulted in the access road being a lot closer to the lane path coming from Carroll Road. So close, it is a pretty-quick right and left turn to cross the runway.

Please exercise caution as you make the turns coming in; you may find yourself focusing on negotiating the access road and the marker flags at the expense of not using your see and avoid strategy for oncoming full size aircraft on final approach landing from the north.

Web Site to Check Wind Conditions

NARCA members… Here is an excellent site to check on wind conditions, I find it to be very accurate:
http://www.usairnet.com/cgi-bin/launch/code.cgi?Submit=Go&sta=KHSV&state=AL

Al Clark

Props – They Don't Need to Be Spinning to Be Hazardous!

I cut my finger in the shop on a prop that I was mounting. Molded props often have a very sharp edge left from the molding process. In my case it was the trailing edge that was as sharp as a razor blade. As I used my index finger to rotate the prop onto the shaft I neatly made three slices in the joint of my index finger before the blood flowed. Nothing serious but a real pain in the finger for a couple of days. I had been told by someone a long time ago that this could happen and that new props should be scraped before balancing. The flashing from the mold needs to be removed by scraping not cutting with a sharp blade held ninety degrees from the prop. My finger has healed faster than my ego naturally. Summer is coming. Next month we will have a few thoughts on staying safe in sun and heat.

Fly Safely,
Larry Holcomb, Safety

Don's Flight Tip #5

Servo Setup Issues

The following setup issues are a serious problem for many modelers when setting up digital servos on small or large aircraft.

If you reflect back on last month's flight tip on linkage setups and rations and then factor in this month's information you can quickly see why so many modelers have drilled planes into the ground with the resulting blame being placed on radio or servo failure when the *control failure was the symptom and not the root cause*. I will address important setup issues in this narrative so the reader can avoid the bucket list of problems that have plagued so many for so long.

When I owned Don's Hobby Shop I took many calls or visits from modelers who complained of having

hot running or burned out digital servos on glo or gas powered planes, melted wires or extensions, and needless crashing of planes due to improper setup of digital servos, linkages and/or improper radio programming. Additionally, modelers complained about battery drop outs or receiver reboots and blamed the receiver. *Receiver reboot is a symptom of a problem but it is typically not the problem nor is it a new problem.* Receiver reboot problem is not new — or limited to 2.4 gig systems. Years ago on 72 MHz systems we called it battery dropout and it's caused by the same factors today that it was caused by 25 years ago. It's just that the system resolution was so poor years ago compared to today's systems, the modeler could get away with sloppy setups and still not cause a problem. Today, if your 6v system (7-8.4V nominal pre regulated voltage) is running at 3-3.4V (approximate voltage where the receiver drops off line) you've got a problem with the setup of your plane. That's not a receiver issue, it's a modeler setup issue.

Modelers often believe malfunctions to be the result of faulty components or the "naturally high current flow for digital servos" when it is improper setup that has caused the high current flow, resulting in servo damage, or receivers that shutdown due to lack of power. Also, you may have heard the myth that you shouldn't use a digital servo on throttle because you will burn it up. *You will burn it up if you don't set it up correctly but that's a modeler setup issue not a servo issue.*

To handle the higher current rates caused by improper setups some modelers believe they need and use gadgets, 16 gauge wire, Power poles or Deans connectors, power isolation systems. While it is not wrong to use these items on gas and glow aircraft, these components often mask the true nature of the problem. Often the "fix" is to treat the symptom rather than address and fix the problem. I believe we should fix the problem.

Let me give you the typical symptoms of digital servos not being setup correctly. — Modelers who set up their planes, *without using a current meter* to properly adjust multiple digital servo linkages, that are driving a single control surface will often experience high idling current, high battery drain, hot running or burned out servos, erratic operating servos or receivers and in worse cases system shutdowns from melted wires, burned out servos, or receiver reboots. In short some do not understand the cause and effect of their improper setup.

The root cause of "abnormally high current draw" is the servo preload or linkage binding that occurs when digital servos are not set up properly. It is virtually impossible to accurately set up travel adjustments without a current meter because digital servos have ***5 times*** the centering accuracy of analog servos. What does this centering accuracy mean in practical terms relative to your setup?

When a standard servo using a 1024 system moves from full left to full right the servo moves 1024 incremental steps from stop to stop. A digital servo uses 5120 steps to travel the same distance from stop to stop hence 5 times the centering accuracy. The center point is the 2560 step in the travel arc. When using multiple servos on a common surface and you are not in perfect alignment, (one servo at 2560 step and the second servo on the same surface at 2574 step, one servo will fight the other servo. (high current flow, receiver reboots etc.) When using a single servo on a surface such as throttle, flaps retracts or tow release and the modeler programs the servo to overdrive the stops high current will be generated often resulting in burned out servos and drained batteries and other issues.

A current meter is necessary to see these setup anomalies because no one can discern the digital centering step of 2560 versus step 2561. That is why we use a meter. *Unlike an analog servo, when a digital servo feels resistance from any source, the servos respond virtually immediately with high current flow, high torque and high holding power.*

Analog servos by comparison take several degrees of travel before they ramp up to their max current flow, torque and holding power. Coupled with the poor centering accuracy of an analog, relative to digital servos, modelers have gotten away with sloppy setups with analog servos that would crash the same plane if it were set up with digital servos.

Misaligned linkages, tail wheel binding, sticky hinges or sub trim not adjusted correctly; endpoint

*and misaligned midrange adjustments **always** cause high current. Don't blame the symptoms. Find and fix the problem.*

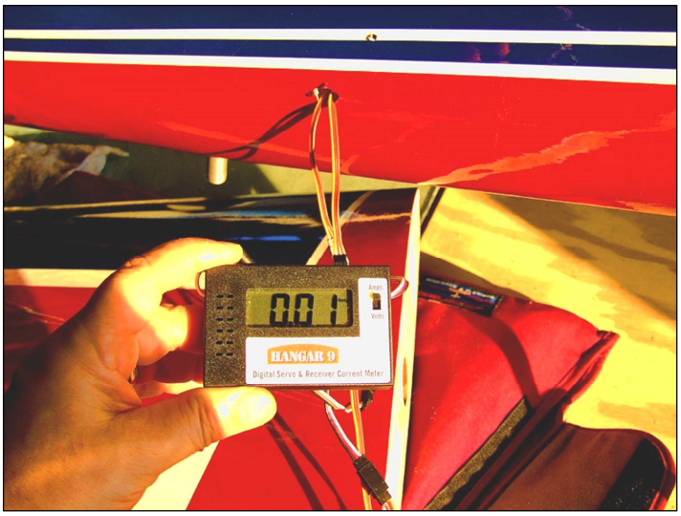
While it is certainly possible to get a new defective component that can cause these same symptoms, the common cause of these problems is due to servos fighting each other or overdriving travel due to improper setup. In extreme cases servos can actually melt due to the setup error.

We have observed that a digital servo's normal idling current is somewhere in the 10-20 mah range – My 40% Carden with 13 JR 8711 and JR 8611 high powered digital servos (about 400 ounces of torque each) has a gang (total) idling current of approximately 200 mah with the plane sitting on the ground. If each of your servos are drawing more than 10-20 mah idling current you've got a problem regardless if it's a giant scale or little electric plane.

Using a Current Meter

To test your setup plug the current meter between the servo and the receiver to measure the current flow to the servo as shown in the photo. One can immediately see if there is binding because of abnormal meter readings.

With your surfaces in neutral you should be reading your servos idling current. If your meter is reading more than idling current , there is a problem that will result in increased battery draw, hot or burned out servos melted wires or regulators or systems shutting down.



The photo shows a current meter plugged into the receiver and a wing servo on a wing that has 2 high powered JR digital servos on the same surface. The reading shows the idle current is 10 mah indicating that there is no binding at the neutral point on this wing. The test is repeated for end points and midrange travel as explained below. Normal idle current is 10-20 mah per servo weather you are checking 1 servo or 2 or more servos per control.

The 3 setup parameteers to electronically measure with a current meter are:

- Subtrim - Neutral
- End point – Max travel
- Midrange travel current flow at ½ travel

Procedure **–** *Travel adjust radio programming should be set to max 140-150' to obtain the best servo resolution before connecting and adjusting linkages for your setup*. With the linkage still disconnected move your stick to full deflection and loosely connect your linkage with the servo at full deflection to check and see if the 150 % traveladjust overdrives your surface. If it does mechanically adjust your linkage to correct. Once corrected connect the linkage and you should read proper idle current.

Subtrim (neutral)

With the radio turned on plug in a servo to the current meter and plug the current meter into the receiver. Read the meter – if the reading is not showing the proper idle current this tells you one servo is fighting the other. Take out your prolink wrench and mechanically adjust the turnbuckle. If the reading gets worse turn it the other way to null out the preload on your servo.

Endpoints -

With the meter still plugged in move your aileron stick to full right deflection (or up or down). Watch the meter. When your ailerons are fully deflected against the stop you should be reading idle current.

If your ailerons bottom out and the servo continues to travel, your servo will stall and draw high current. *Reduce this travel overdrive by moving the linkage connection out on your control surface or in on your servo or a combination of both*. Reducing end point travel through your radio programming is the next step for *fine tuning* the total travel.

Repeat the process by moving the aileron stick to the full left position and nulling out any preload using the same process described above. On throttle, make sure the servo does not overdrive the idle and high speed stop. (burned out servo) *Pay close attention to throttle, flap and retract and tow release servos overdriving their endpoints.*

Now for the midrange travel -

Move your stick ½ way – If your full travel is 40 degrees move the stick so your surface travels 20 degrees. Check the current reading. If it jumps in the mid travel this tells you your linkages are improperly adjusted. When using bolt type linkage fittings screwed onto the bolt, the binding at this point is caused because the fitting, that the pushrod is connected to, is not connected the same distance from the hinge line. In other words, to illustrate this issue let me exaggerate the problem – If you are 20 turns out from the hinge line on one bolt and 10 turns out from the hinge line on the second bolt the mechanical connection may scribe a 1 ½" travel radius on one servo and a 2" radius on the second servo. Now you can visualize the binding that takes place if these linkages are not set up in perfect parallel symmetry. (See Flight Tip 4).

Disconnect the linkage and turn the fitting in on the bolt a few turns. Reconnect the linkage and read the meter – If the reading is worse disconnect the linkage and go in the other direction until the preload is nulled out. Note: With the linkage disconnected, you can check your servo to see if you have a defective servo. If you are drawing more than idle current with no linkage hooked up the servo may be defective (not likely but not impossible).

Note: The above checks are not limited to being performed on dual servo setups per control surfaces. They should be performed on planes with single servo setups per surface to check for servo overdrive. High current draw on single servo surfaces can be caused from servo overdrive at the endpoints, a preload on the control surface from a crooked hinge line or glue in the hinges line.

Now you can see why so many modelers, who don't perform these basic checks, burn out servos and draw high current resulting in batteries that drain after just a few flights. The impression to the uniformed is the battery, servos or receiver is defective when the root cause is improper servo linkage or travel setup. The fix is not to install heavier wire, big connectors, power isolation systems and a host of other gimmicks, some of which cost hundreds of dollars, to compensate for their problematic setup – *The fix is to set the plane up correctly*. While it's not wrong to use these items, all of these devises are unnecessary if the plane is set up properly.

These setup errors often times cause planes to needlessly crash with the blame being incorrectly placed on components that failed due to modeler induced setup errors. While the loss of the plane is sad, the overriding concern is will someone get hurt or killed due to an out of control airplane due to a negligent setup.

The reader should also note that modelers sometimes develop misplaced trust in their systems that have not been setup properly. It may take a number of flights for the servo to fail thus giving the modeler a feeling that when the failure does occur that it was due to a bad servo rather than recognizing that the failure was the symptom and not the root cause of the crash.

I don't often fly planes that have digital servos that have not been setup with current meters but when I do I wear my crash helmet. 😐

Remember, ***don't guess, measure***. Knowledgeable modelers use current meters to address these setup issues to reduce the likelihood of a "Servo Failure or Brown Out" due to improper setup.

Until next time - Fly Safe. ✈