



NARCA Eagle

Volume 2016-05
May 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 May 12, 2016
Time: 6:30 PM
Program: TBA

Upcoming Club Events

May 14 - Monthly Aerotow

Eagle Droppings From the President:

The big news this month is the changing of the north end of the runway. I know most of you are wondering 'What the heck is going on?' and I just want you to know that the Executive Committee has spent a great deal of time wondering 'What the heck is going on?'. Well, the way I understand things the last 300 feet of the runway has never belonged to the Epps family, but belonged to a family on the other side of Carroll Road. For 50 years the owner and Mr. Epps had an agreement to use the land. After the owner was out of the picture his offspring kept the same agreement. Then his grandkids said, 'What can we get for it?' and they sold it.

No one in the club knew the property we were improving and using wasn't Epps property. Exec isn't happy about spending a few hundred dollars on new rock for the road only to lose the road. Fortunately Jared was able to scrap up a bunch of our rock for use when the new track is laid out.

The Epps have been trying to negotiate with the new owner for continued use of the full length of the runway but my understanding is he won't talk about anything.

For us nothing should change operationally EXCEPT the new north boundary is the access road, quite a shortening up of our airspace. Since few people fly north of the access road anyway there should be no impact on most of our activities. The reason for the new boundary is the new owner apparently doesn't like aviation (ooh, good choice of a land purchase) and we don't want

to give him anything else to whine about. I expect legal action will take place in the future and I don't want the club involved so let's try and be reasonable about things with the new owner.

The weather has been great so try and get out to enjoy it. My medical adventures seem to be calming down a little so I hope to see you guys out at the field soon. Land softly! →

Rick Nelson, President



Membership (Second Vote) April 2016 Meeting

- Tom Fleming, Archie Phillips sponsor

14 April General Meeting Minutes

This was the annual Duane Black memorial Project meeting. Duane Black was a NARCA founding member and officer of NARCA and a model builder extraordinaire. In his honor we meet annually to show building and re-building projects and acquisitions accomplished in the previous year, especially over the winter building season.

Prior to the meeting we welcomed all in attendance then food was served. We had Bar-B-Q headed up Bob and Brenda Stewart. The meal commenced at 6:30 PM.

Meeting called to order by Secretary Archie Phillips at 7:00 PM in the Pineview Church Meeting Room (President Rick Nelson had a sore throat and difficulty speaking). At this meeting business is

held to a minimum so only three first votes and one second vote occurred before presentation of the build projects and indoor flying in the Pineview gym.

Attendees list was not taken but we had 22 NARCA members and family.

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

First Votes. Three new introductory members were approved:

- Thomas Borders with Eddie Denney at sponsor.
- Alan Bast as a NARCA Training member with Rick Nelson as sponsor.
- Kype Schikore as a NARCA Training member with Rick Nelson as sponsor.

Welcome all three to NARCA as introductory/training members.

Second Vote. Rick Nelson *quietly* spoke on behalf of Chuck Pierce. Vote was taken, approved. Welcome Chuck as a NARCA member with full privileges.

With a special thanks to the spouses in attendance the meeting was adjourned at 7:40 PM.

After the short meeting several NARCA members showed models that had been built over the winter.

- Alan Bast and Kyle Schikore are engineering students at UAH and are receiving NARCA assistance to complete term project to explore “Green” concepts and materials in construction of aircraft. They explained their project using concept aircraft by George Rittenhouse, Rick Nelson, and Larry Holcomb.
- Bob Stewart showed his scratch-built “Mysterion” electric plane (designed by Al Clark). Bob had some of the parts laser cut from the plans. The plane was covered with red and white film and has a folding propeller for belly landings.
- Cliff Lanham showed a small electric plane which was a rebuild project. Cliff explained the techniques used to remake the wings and fuselage.

- Archie Phillips showed a Chinese built ARF motor-glider and explained the difficulty fitting equipment into the small plane. Also showed and explained the rebuild of a 40-size pattern plane acquired at the swap meet.
- Bill Beasley showed and explained an ARR Messerschmitt die bomber that had a sound system to emulate a full-scale aircraft.

After the show and tell session some members took to the air with indoor flying of fixed and rotary wing (mostly quad-copter) models.

*Respectfully Submitted,
Archie Phillips, Secretary*



**Don's
Flight Tip #4**

Control Setup Issues

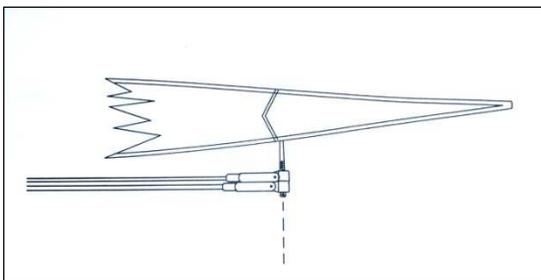
When setting up control surface travels one needs to insure proper linkage geometry to obtain proper mechanical advantage. Failure to do so often results in flutter or other control or trim problems. You don't have to be a competition pilot to enjoy flying a plane that is setup properly.

Here are some basic mechanical and programming guidelines to be aware of when setting up control travels:

First check your control horns and make sure they protrude from the control surface at exactly the same angle. Crooked or misaligned control horns on split elevators and ailerons, relative to each other, will build in differential travel making control setup difficult. A small cardboard template can be made or use an adjustable protractor to measure the control horn angle which should be identical on each side.



The misalignment on these threaded control horns on the right elevator or aileron compared to the left side will cause unequal travel relative to each other. Fix this control horn misalignment before going further. Additionally, if your linkage is 30 turns out from the hinge line on a threaded control horn, to the clevis on 1 side, and 33 turns out on the other side you will experience unequal travel making it impossible to properly trim the plane.



The right and left side elevator or aileron threaded control horns in this diagram are vertically aligned but one clevis is screwed in closer to the hinge line and will cause one surface to travel further and faster than the other. The distance should be the same for both or the plane will experience trim problems as a result of elevators being setup with different travels. This causes the elevator input to roll the plane as the elevators act as ailerons. If the aileron travel is off because linkages are not set up correctly the airplane will wobble through its rolls instead of rolling on its axis because the unequal travel induces differential travel.

Next, before connecting linkages set your radio travel adjust to maximum. Most radios go to 140 or 150%. This setup forces the servo to work through its full range of travel from stop to stop and takes advantage of the high radio resolution offered on

today's radios. Proper setup allows for even servo gear wear and improves travel resolution.

When set up properly it's better to move your servos 60 degrees each side of center to obtain 15 degrees of control travel rather than moving the servo 10 degrees each side of center to produce 15 degrees of control travel. In the first case it takes 4 degrees of servo travel to produce 1 degree of control travel (very fine resolution) and in the latter it takes the 1 ½ degrees of servo travel to produce 1 degree of control travel (course resolution). You can see the control resolution is much better when the servo moves a lot to get the desired control travel. If you have ever experienced 1 click of trim being too much or too little you've experienced the effects of course servo resolution due to setup or programming issues described above.

Next mechanically adjust maximum desired surface travel on high rate for your maximum desired travel by adjusting and choosing the pushrod position on the servo arm and control horns. *It's better to have the pivot point in on the servo arm and out on the control surface to reduce flutter potential.* After the mechanical adjustment is performed the radio programming can be used to tweak any remaining variances that need correcting. Avoid doing the majority of your travel settings by programming travel electronically rather than mechanically resulting in massive electronic trim adjustments that is off scale to get the surface travels to match. This indicates the radio is being used to correct a deficient mechanical setup.

After the max travel has been set mechanically, dial down your travel adjust for low rates. A safe starting point for travels is 15-18 degrees for high rate and 10-12 degrees for low rate. This assumes correct CG, straight plane, correct thrust line and incidence levels. Notice I said degrees and not inches. A degree is a degree whether it's a ½" wide elevator on a trainer or a 6" wide elevator on a giant 3D plane. A ½" travel on a 6" wide elevator may only give you 3 degrees of travel (insufficient) and a ½" travel on a ½" wide trainer 40 elevator may give you 45 degrees of travel (too much). Regardless of the elevator size, movement in degrees gives relative performance whether you are flying warbirds, giant scale trainers or sport planes.

These travels will allow you to have adequate and predictable control authority on the test flight. You can then adjust travel volume up or down to your liking after the test flight.

For starting points on 3D planes, 45 degrees or more of 3D travel is usually set up with medium rates being 15-18' and low rates of 10-12'. I fly my planes with aft CGs (not for the test flights) so after setting the CG thru a series of test flights, moving the CG back a little at a time, travel is reduced and the expo is increased to make the plane fly like I want it to. I usually wind up around 6 degrees low rate 12 degrees high rate and 45 degrees or more for 3D rates with an aft CG location.



Don't Laugh – All right – Laugh - It works - The photo was taken the day I was moving the CG back to the point where the plane flew like I wanted it to fly. The CG adjustment was done in 1 flight but I landed 15 times, kept the engine running, my helper strapped on little pieces for fine tuning and big pieces of lead, feeler gauge, padlock or anything else I could find for course adjustments, took off, felt the plane in various attitudes, landed added more weight until I got it right. Once the weight is determined an equal amount of lead can be buried in the tail.

IMPORTANT

When setting the mechanical linkages the distance from the servo arm center to the pivot point where the ball link is connected on the servo arm should be less than the distance from the control surface

hinge line to the pushrod pivot point on the surface control horn. IE: If using a 1¼" servo arm with the connection in the outer hole, the distance from the hinge line to the connection on the surface control horn should be no less than 1¼". Failure to maintain this 1:1 minimum ratio is conducive to flutter. Don't use a 1¼" servo arm in the outer hole with a hinge line to control horn distance of 1" This setup gives massive travel but is prone to flutter. I've seen many planes drilled into the ground due to flutter from this incorrect setup. It took the industry a few years to learn this setup lesson the hard way.

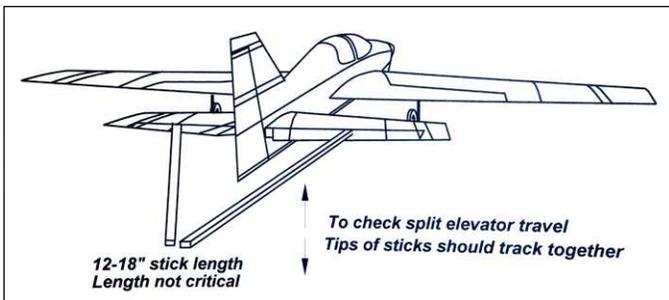


Look close at this photo or enlarge it. Shown is a 1¼" servo arm with the ball link in the second hole position and the control horn fitting screwed all the way out. The distance from the hinge line to the pivot point on this plane is about 1¾" keeping the ratio on the safe side of the 1:1 ratio discussed earlier.



This photo shows the 3D travel being checked and set with a throw meter set to 44 degrees which on my plane is plenty for 3D maneuvers as I fly with expo and the CG set on the rear limit.

Make sure split elevators track parallel to each other. To check this function tape a balsa stick to each elevator half and move the controls thru their full range of travel and watch the tips of the sticks. The tips must track in perfect unison or the differential elevator travel will induce rolling moments and trim problems. If one side travels faster or further than the other the plane will drop a wing in looping maneuvers forcing the pilot to constantly fight the plane with control inputs to keep the plane flying straight.



I don't often fly untrimmed airplanes but when I do I feel like stabbing myself with an icepick to put me out of my misery. 😞

You don't have to be a competition pilot to enjoy flying a trimmed straight aircraft. Assuming you have a straight plane with CG properly located, incidence set correctly, and the plane has been trammed, these basic linkage setup steps will help your plane fly like it's on rails. Ahhhhhh.

Until next time... Fly safe!

Do You Know If Your Aircraft is Ready for Flying?

Well, when I put my airplanes on the shelf for the winter my last flights were flawless. I stored my batteries properly, what could be wrong?

OK, spring is hopping, and I'm eager to get in the air. Shoot, it flew great last time out (was that six months ago?) – I wanna get going quickly so I just listen for the proper beeps, bump the throttle for a second to confirm I have thrust and off I go! Wait... does your Safety Officer really do that? Keep reading...

There are a couple of risk factors here that were overlooked by the above scenario:

- **Potential "Goofy" Mode of the Radio.** Electronics are diabolical. Computer radios think faster than us. Yours truly has been out with three planes already this year that were doing great last fall. All were screwed up. On a Radian glider flaps respond to aileron, rudder to aileron, aileron to flaps. Nothing. Everything was crazy. Checked all channels were plugged in ok. My first check was throttle and it was good. After several minutes of frustration, Bill Beasley, who is good with Spektrum radios suggested rebinding. After the rebind everything was working as it should. Go figure.
- **Broken hinges, control horns, cracked wings, etc. caused by hangar rash or other factors.** Assuming these are OK without a full pre-flight is asking for a crash. My preflight on Hueys took 20-30 minutes and the Chinook took an hour or more. Preflight to avoid the surprise of a flapping aileron on one side of the wing; that makes for an interesting demonstration of airmanship (and just plain luck if you get her down in one piece).

The bottom-line is don't get complacent and lazy; always do a heavy "C" check on the bench, check the "biggies", and when you get to the field do an abbreviated check again in case you strip a servo or damage something else during transit. →

Larry Holcomb
Safety