

# Carrier Wave

Newsletter of the Phantom Flyers R/C Club

<http://phantomflyersrc.com>

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## July 2006

### Upcoming Events/Important Notices

**15 July, Field Prep for Electric Fun Fly**

**19 July, Club Meeting at Flying Field**

**22-23 July, Electric Fun Fly at Flying Field**

**16 August, Club Meeting at Flying Field**

**26-27 August, Pattern Contest at Field**

Articles, pictures, and tech notes for publishing in the Carrier Wave are always appreciated. I try to get the Carrier Wave out a week before the monthly meeting, please submit articles a week and a half before the meetings. Please send pictures, preferably in JPEG format, in separate files from text files. Text should be in MS Word format, simple text file format, or some format that MS Word can read. Indicate where pictures should be in the text with a note in parentheses such as (Picture ABCDC001.jpg goes here). I will integrate text and pictures in my page layout program.

Thanks,  
Dave Evans



AMA Club # 393  
**Phantom Flyers**  
St. Charles, Mo R/C Club



Meeting was held at the flying field with about 16 participants. Frank Thomas presided, because Ed White was out of town.

No new members present but several guests attended. Note new member comment in the Treasurer's Report.

Secretary's Report was accepted as written in the Carrier Wave.

Treasurer's Report given by Dan Sundman and accepted. During the last reporting period he accepted dues from five new club members.

Boeing Recreation Report given by Larry Leuschke - Boeing is stopping property insurance coverage for the R/C field in September. Boeing will still provide liability insurance coverage. The club will have to find its own policy to cover property loss. Larry Leuschke, Dan Sundman, and Emery Kattelman are going to check around on what coverage level we need and get quotes.

GLSMA Report - nothing to report

Field Manager Report - the field improvements being considered - crack filling, new gravel in the lot, etc - are of a minor nature at this time, so the club voted to delay the work party activity until cooler weather arrives in the fall. A low pressure hydraulic line disconnected on the new mower which killed the mower steering until the line was reconnected and hydraulic oil was added. It seems to operate fine again, but report anything unusual you notice about the new mower operation. There is a need for the formal grass cutting schedule to come out. The retirees feel they are doing too much of the cutting and want the working guys to do their share. Frank Thomas is going to talk to Ed White about this.

Safety Officer Report - nothing to report

Activity Report - the barbeque was canceled due to bad weather, but we had already bought all the food, and it's all stored at Herb's house. The club agreed to combine the barbeque event with the E-Fly on 22 July. We provided free hotdogs at last year's E-Fly, and it was a big hit. The E-Fly is one of the most fun events we have, and this year's will be even better, because we'll have even better food than last year.

Old/New Business - nothing different than already mentioned.

Tech Session - Dan Sundman gave a battery bunker presentation for safely charging Li-po's. He used a standard metal ammo box bought at Uncle Sam's for six dollars and showed how he made the cut-outs in the box. It was simple and easy to make and could contain the damage potential of an unruly Li-po.

Meeting adjourned with time for one flight before sundown. Note: several searches had been made by end of meeting for a bright yellow electric model belonging to Al Grossmann that "landed" in the corn just out from the center of the airfield. As of this writing the model is still lost.

Herb Johnson

# Pattern Flying Seminar

Bill Ahrens stepped in when Ed White was, unfortunately, called away due to a death in his family. Our condolences to Ed and his family. Your intrepid editor/photographer/reporter was unable to attend the event, but Bill reports that everything went well and the participants enjoyed themselves. Bill provided the following for those who wish to prepare their aircraft for precision stunt flying. Actually, these are good for any of us that just want our airplanes to fly better.

## OTHER TRIM INDICATORS

There are other symptoms for out of trim conditions. These require additional refinement to one or more of the bench or flight setup steps. Sometimes, especially if you get confused, it is best to simply start over from the beginning. Here are a few problems you could encounter:

**Loops track a spiral path or one wing drops after pitch transition** -- Check lateral balance. Check elevator halves alignment.

**Plane not tracking acceptable down lines** -- Check CG, then incidence for elevator neutral trim in level flight.

**Plane rolling in downlines** -- Check ailerons for neutral trim.

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control surface at neutral trim.

**Control Surface Horns** -- Verify that all control surface horns are perpendicular to the centerline of the control surface cross section.

**Control Throws** -- Verify the above linkage and horn alignments by measuring for equal throws of control surfaces.

## FLIGHT SETUP

**Elevator Trim** -- Move the wing main adjusters (if available) for both wings by equal amounts in the same direction until the elevator is at neutral trim in level flight. Move both leading edges down to reduce down elevator trim. Move both leading edges up to reduce up elevator trim. If using stab adjusters you can move the leading edges in the opposite directions indicated for main wings to achieve the same result.

**Aileron Trim** -- Move the main wing adjusters (if available) for both wings by equal amounts in opposite directions until the ailerons are at neutral trim in level flight. To reduce right trim move the right leading edge down, the left leading edge up. To reduce left trim move the right leading edge up, the left leading edge down.

**Engine Right/Left Thrust** -- If the plane tracks left when transitioning from level flight to a vertical upline then add right thrust to the engine, if it tracks right then reduce right thrust.

**Engine Up/Down Thrust** -- If the plane tracks to the canopy from a vertical upline then add down thrust to the engine, if it tracks to the belly reduce down thrust.

# NSRCA Precision Aerobatics Clinic

## Flight Trimming & Set up

Dave Guerin  
NSRCA Competition Manager

### Flight Trimming

#### C.G Location

We require our aircraft to fly straight and level, straight up and down, and inverted with minimum input, and not be speed sensitive. Not a small order. The center of gravity or balance point is the starting point of all trimming because it affects every trim function on the aircraft. Without going into a long explanation I will attempt to explain how Center of Gravity location affects our aircraft. Every aircraft design has an ideal center of gravity. Airfoil design and wing plan form will determine where the CG will be on a given aircraft.

.It would appear that we can compensate for nose heavy or tail heavy conditions to some degree with incidence or elevator trim, but we pay a price. In the case of a nose heavy condition we are using the stab to hold the tail down. In a tail heavy condition it is holding the tail up. As speed changes the wing and stab are either more or less effective causing the aircraft to climb or dive.

1. Any time a control surface is not trimmed to neutral its effect is speed and attitude sensitivity. The term attitude relates to whether the aircraft is flying upright, inverted, or straight up and down
2. When the aircraft is flying vertically the wing is no longer lifting the weight of the aircraft so the elevator trim is no longer correct.
3. In knife edge flight the wing is vertical and not lifting, the elevator is now a rudder steering the aircraft.
4. When the aircraft is inverted any trim used to compensate for CG error will be backwards. Nose heavy will dive and tail heavy will climb

Therefore: aircraft trimming must start with setting the correct CG

Flight trimming **begins** with verification of the C.G. location. **Do not do anything else until this is done.**

The correct procedure is to trim the aircraft for straight and level flight, then roll to inverted and note the amount of down elevator required for level flight. A slight amount of down should be required..Land the aircraft and adjust if necessary.

#### Incidence Settings

##### Elevator

**After** the C.G. is correct note the neutral trim setting of the elevator. If it is slightly up add more positive incidence to the wing. If it is down reduce the incidence.

Test fly, trim for level flight and check again. Repeat this process until elevator trim is neutral.

### Ailerons

If the ailerons are not in neutral with the aircraft trimmed to fly straight and level the wing incidence must be adjusted again. If an aileron is up that panel has too much positive incidence. If an aileron is down that panel needs more positive incidence. Adjust, fly again and re-trim. When you are satisfied everything is correct there is one more test.

Fly to a comfortable altitude, reduce throttle, and point the nose straight down. Note if the aircraft rolls to the left or right on the down line. Repeat as many times as necessary to be sure. If the aircraft rolls left reduce the incidence in the left wing panel or increase the incidence in the right wing panel. Repeat the test and re-trim until the roll is eliminated.

### Thrust Settings

Assuming you have done the other steps correctly the only setting that is effective in vertical flight is thrust. **Do not change anything else!**

To determine if the thrust settings are correct pull the aircraft to vertical and note if it moves to the left or right or toward the canopy or bottom. Add or take away thrust angle until the aircraft goes straight up.

Note: Some aircraft-propeller combinations require extreme right thrust angles to make hands-off vertical lines. Experience has shown that extreme right thrust can cause problems in horizontal and inverted flight at cruise (mid range) throttle settings. If this becomes the case it is wise to reduce the right thrust and deal with the issue in a different way. We will cover this in Set-up.

**At this point the basic trim is complete**, but because there is some interaction between C,G location and incidence settings it would be prudent to verify the C,G again.

## Set Up

### Control Surface Deflection

To maximize servo resolution it is necessary to use 100% servo travel where possible.

Use the dual rate function in the transmitter to adjust aileron and elevator throw until the aircraft is comfortable to fly. Remember- at this point we are adjusting for high rate.

Now measure the amount throw you are using at each control surface. Write it down. Return to high rate at the transmitter and mechanically adjust each control surface to the new throws. You now have set the high rate throws with 100% servo travel.

At this point you should zero out the dual rates and add new values for low rate as necessary.

**Note:** The Dual Rate function is used for this exercise so that servos that are mixed together, such as ailerons, will track the change together. They will not track together in end point mode.

### **Aileron Differential**

It is important that or aircraft roll around the thrust line in order to track straight in vertical lines. There are many factors that influence the amount, if any, that is required for a given aircraft. Top hinged ailerons are an example that can be a real challenge. This is a trial and error exercise, but is important and worth the time and effort.

### **Mixing**

Mixing is a last resort to be used only when all other trim options have been exhausted.

Mixes are control surface deflections and are speed and attitude sensitive. **Use with caution!**

**Pitch Mix:** The most common mix is pitch, usually more with left rudder than right. The mix will not be the same on both sides because our aircraft are subjected to spiral air flow from the propeller.

The mixing requirement can be checked either in knife edge or straight and level flight. I prefer to use straight and level because that's where we use rudder most for positioning and heading corrections.

Set up the mix function in the transmitter. Fly the aircraft straight and level and apply rudder. Note any pitching, add the appropriate mix and try again. Repeat as necessary.

It is wise to verify mixes on a vertical line to be sure you have not created a problem with inputs in that attitude.

**Thrust Mix:** Thrust mix is used to correct the need for extreme right thrust. An incremental mix function can be set up to add right rudder at higher throttle settings.

### **Exponential**

Exponential is a great tool for making an aircraft feel comfortable, but if used to extremes it can create some spooky results.

A large amount of exponential creates a soft spot around neutral which may feel good in calm air but makes it difficult to correct for turbulence because of the amount of stick deflection required. The result is you tend to get behind with corrections.

A large amount of exponential creates a sharp curve at approximately half stick deflection making it difficult to smoothly transition through that area.

### Propeller

Engine, airframe, propeller combinations need to work together to optimize performance.

Experimenting with different combinations of propeller pitch, diameter and number of blades can help to optimize throttle management and overall performance. Don't be afraid to experiment.

## **Events on KCRC Calendar**

**See the KCRC website for more information - [www.kcradiocontrol.org](http://www.kcradiocontrol.org)**

July 8, 2006  
49th Jumbo Squadron  
Military Fly-In  
Charles W. Reed III Field

July 22, 2006  
KCRC  
Charity Fly-In  
Charles W. Reed III Field

August 12, 2006  
SMRCC Fun Fly  
Shawnee Mission RC Club  
SMRCC Field

August 26, 2006  
49th Jumbo Squadron  
Jumbo Jamboree  
Charles W. Reed III Field

September 9, 2006  
KCRC  
Annual Warbird Fly-In  
Charles W. Reed III Field

September 16, 2005  
City Wide Fly In  
Shawnee Mission R/C Club  
SMRCC Field

October 7, 2006  
49th Jumbo Squadron  
Fall Fly In  
Charles W. Reed III Field

MEETING OPENED: 7:00 PM

ATTENDANCE: Aero Pilots, Balsa Busters, Laf. Esq., Lone Eagles, River City Flyers, ST. Louis Rocketry Assn., Signal Chasers, St. Louis R/C, Thermaleers

MINUTES: Accepted as published

TREASURER'S REPORT: Old Balance \$12,951.68                      New Balance \$13,117.07  
Buder Permits Issued in June - 15      Year to Date - 267

#### OLD BUSINESS:

- ◆ Extravaganza:
  - Clubs are requested to continue to recruit Parking Assistants for Extravaganza. Remember, a burger, drink and chips for an hour's work.
  - Still looking for more flight simulators for Extravaganza. We don't have enough yet. Call Steve Mizerany 636-225-1076.
  - Clubs are asked to prepare an Information Flyer that gives information about your club: name, meeting place/time, day of month, dues, etc.
  - The poster made by Scott Olson was passed around. Plan to add a Rocket and a Free Flight aircraft to the picture.
  - No new information from Red Cross on Blood Drive. Troy Von Kloha has the action item.
  - Tim Storey volunteered to work on a "News Release" to get some publicity in the local papers before the event.
- ◆ No changes to the Usage Agreement Draft were requested. However, Parks Dept. is making a few changes that will be reviewed by GSLMA when they are completed.
- ◆ Event Reports:
  - SAM NX211 staged a successful contest on June 15, 2006.
  - River City Flyers had a very successful 3-day Fly-In over the July 4 weekend. Fifty-three pilots participated.
  - St. Louis Rocketry Assn. did a launch on June 17. It was a success in spite of the rain.

#### NEW BUSINESS:

- ◆ It was learned that we will not be able to do Buddy-Box flights with Extravaganza attendees because AMA rules prohibit such activity at an AMA sanctioned event.
- ◆ Runway resurfacing work at Buder Park began on July 5. The field will be closed to flying through July 12, 2006.
- ◆ Event of Interest: Bruce Weidener reported that the Scott AFB Air Fest will take place at Scott AFB on Aug 12-13, 2006. Thunderbirds and the Marine Air Wing flying F-18 aircraft, and an F-15 flight demonstration will be part of the event.

MEETING ADJOURNED: 7:40 PM

NEXT MEETING: Wednesday, August 2, 2006, at 7:00 PM at the Grand Glaize County Library, 1010 Meramec Station Road.