Carrier Wave

Newsletter of the Phantom Flyers R/C Club http://phantomflyersrc.com

CLUB OFFICERS	Work	Home
President – Ed White	232-1479	(636) 441-6431
Vice President – Frank Thomas		(636) 394-1546
Secretary – Tim Wortkoetter		(636) 248-4333
Treasurer – Dan Sundman	777-9204	(636) 281-0676
Safety Officer – George Dauble		(636) 447-3627
Boeing Rec Counselor – Larry Leuschke	234-5116	(636) 537-1472
Field Manager – By Committee		
Chief Flight Instructor - Al Bone		(636) 723-4062
Activities Committee Chairperson - Dan Abel		(314) 830-0138

Board of Directors:	Work	Home
Ed White	(314) 232-1479	(636) 441-6431
Jim Wortkoetter	(314) 777-8953	(636) 947-1034
Mitch Galatioto	(314) 234-5141	(636) 447-5484

Send Membership Renewals to:
Tim Wortkoetter
5212 Woosencraft Dr.
Wentzville MO 63385

Send Newsletter Items to:
ED. Dave Evans
4214 Bedford Creek Ln.
Wentzville, MO 63385
Phone (Home) (636) 332-1980
Email: Email: editor06@phantomflyersrc.com

March 2006

Upcoming Events/Important Notices

March 15, Club Meeting at Senior Center

March 25, Swap Meet

April 19, Meeting at Senior Center

Notes from the Editor

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 RC Club

Minutes 2-15-06

Meeting was called to order at 7pm by President Ed White. There were 19 members present with Bill Chipman as the only new member.

Minutes were approved as written.

Treasurer Report: approved as given.

Activities: Dan reminded us of upcoming fun fly and float fly once the weather starts to get nicer. Check the web for the schedule of events for this year. Dan is looking for CD’s for the helicopter and electric fly. The rocket launch has been moved to April 8.

Swap Meet: Mark Twain offered to give discounts off of the gift cards for the swap meet. Jim Alberico has contacted sellers at other meets he has been to. There have been some companies that wanted to come but have other events around the same time. We are going to have to give much thought about whether we want to keep the same date next year.

GlSMA: none
Field Report: none
Safety: no issues at this time
Recreation: None

Old Business: Board of Director Phil Moore has resigned. Ed White asked Mitch Galatioto to be on the board and was approved by the officers.

New Business: The Budget was created before the meeting via an officers meeting. Check else where in the carrier wave to see budget; will approve at next club meeting.

We need to add the new frequency spots to the frequency board for the spread spectrum and 2.4 GHz. Dave Evens volunteered to make the necessary changes.

Frank Thomas brought up his concerns for the long term outlook of the club. He proposed to set up a committee to find new ways to raise money and new members to keep the club vital in the future. If you want to help with the committee contact Frank. We are hoping to have some of the younger club members help with this!!!!!
Frank now has a diagram for the lithium/poly charger to charge those specific types batteries. He is trying to get a group together make a group of circuit board.

Meeting was adjourned at 7:56

Reminder: UAV is very important with the club to help maintain the lease. Our club is an official test site for the UAV program with FAA so please give them the right away.

From the Middle Point RC Flyers, Murfreesboro TN
Windy Weather Flying
by Clay Ramskill

All too often, on an otherwise nice but windy day, folks just don't fly. Obviously, for a beginner, that's common sense—but for someone who has some experience, the wind can be a challenge that adds some spice to flying.

While it's easy to see that experience level has a lot to do with how much wind is too much, it may not be quite as apparent that the type of model you're flying also can have a great effect on your ability to handle winds.

Let's go through some airplane design features to see which ones give us the best flying characteristics to handle winds and the resulting turbulence.

Size: In general, the larger the airplane, the better it will handle winds of all kinds; large models don't "flop around" as much!

Dihedral: The more dihedral in a model's wings, the more they are going to be affected by crosswind gusts; it is hard to keep the wings level, therefore lineup to the runway is difficult in a crosswind situation.

Wing Loading: The higher the wing loading, the less an airplane will be affected when hit with a gust.

Aspect Ratio: Lower aspect ratio (stubby) wings will be less bothered by gusts; there is less leverage for side forces to upset the airplane, and lower aspect ratio wings have a greater tolerance to changes in angle of attack caused by gusts.

Power: Having the power to overcome the force of wind is necessary. The same thing goes when you get into a sticky situation.

Lateral Control: Ailerons are beneficial in a crosswind landing and takeoff phases. The ability to dip a wing into a crosswind without changing heading is essential, as is the ability to rudder the airplane parallel to the runway heading while keeping wings level with aileron while landing.

Landing Gear: Models with tricycle landing gear are easier to land and take off in a crosswind than tail draggers; in addition, the wider the spread on the main gear, the better.

Maneuverability: This one is a bit harder to quantify. You want a model with stability, yet you do need good maneuverability to cope with gusts. Therefore, you want a model that is stable, yet responsive.

Wing Mounting: Generally, a low-wing airplane will handle crosswinds better. This is because the center of gravity of the airplane is nearer, in a vertical sense, to the aerodynamic center of the wing. Therefore, a side gust does not roll the model as easily. Moreover, by mounting the main landing gear on that low-wing model, they can be spread wider.

It's unfortunate that almost every item above is in direct opposition to the characteristics found in many popular trainers. The main exception is the requirement for tricycle landing gear. But even with trainers, there are differences. Compare a Seniorita with the Kadet Mk2. While the Seniorita may be a bit slower and a bit easier to fly, the Kadet, with its ailerons, higher wing loading, lower aspect ratio, and lower dihedral, is a far better airplane when flying in windy conditions. Going a step further with the same kit manufacturer, the Cougar (.40)/Cobra (.60 size) kits embody all the right characteristics for windy flying.

In closing, I offer Confucius' only known saying about RC flying: "To learn to fly in wind, one must fly in wind!"

From the Prop Masters RC Aero Club, Downers Grove IL
Preflight Inspection
by Ivan Cankov

Preflight training teaches the student how to inspect and prepare his model for flight. Like full-scale airplanes, a model airplane flight does not start with takeoff and end with landing. It starts with preflight inspection and ends with inspecting the airplane for any damage because of hard landings or suspicious behavior during flight. As are full-scale airplanes, our model airplanes are complex machines. To ensure a successful flight we must make sure that all components are in proper working order.

We are in this hobby mainly for the fun, but we all crash—we just don't know when. Even trainer models flown with an instructor using a buddy box will crash. The causes can be component failure or pilot error; yes, instructors err too.

To keep it fun we have to follow safety rules—both general safety rules as well as specific rules that apply to our model aircraft field. Students must learn to follow these rules to ensure that all pilots and spectators are safe and property damage, if any, is limited to our model airplanes only. Safety is of concern to everybody—all pilots at the field whether club members or not, flying or not, spectators, and people just passing by. All model-aircraft pilots should enforce the rules and make bystanders aware of potential hazard areas around the field.

Inspection of a new airplane starts with checking the integrity of the main glue joints and all screws. A student's model comes to the field already assembled so it's not possible to thoroughly check whether it is perfectly put together—whether it's scratch-built, built from a kit, ARF, or RTF. Despite this, an instructor is able to check the components that are likely to fail under stress during flight. These likely failures are the wing joint, tail feathers, control surfaces, landing gear, engine mount, and firewall.

Models are not considered airworthy if there are any problems found. Remember, you're a winner when you get your airplane(s) home in one piece even if you haven't flown them. Any problem(s) found need to be fixed and another inspection performed. Some of the problems can be fixed right at the field. Others require more time and the convenience of a workshop.

Test the wings by placing the center flat on your chest and pulling the wingtips with a reasonable force. Performed the test in both directions—top and bottom of the wing. The joint should not crack. Some ARF and RTF manuals state to use tape or small plastic straps and screws to hold the wing halves together. My advice is to glue the wing halves together using 30-minute epoxy unless the wing is specifically designed to use a different method, such as the NexSTAR wing.

Pulling the tail feathers up, down, and sideways should not move them. Again some ARFs and RTFs use studs glued in the fin and nuts (with plastic inserts to prevent them from unscrewing) to bolt the tail feathers to the fuselage. It's somewhat handy for transportation and storage but they are also more likely to fail, so my advice here is to glue them in place while still using the nuts.

Pulling the control surfaces—ailerons, elevator, and rudder (and flaps on some airplanes)—is the easiest way to check them. They should stay in place. Inspect the hinge gap; is it too big? If so, seal it. The easiest method I've found is to use regular Scotch tape. I always carry a roll in my flight box for repairs at the field (including repairing holes in the covering caused by landing in the weeds).

Check all linkages: there should be no play or slop. Play or slop in the linkages as well as big hinge gaps can cause flutter that can in turn destroy the wing, stabilizer, or fin to which it is attached. Although trainers have smaller control surfaces, moderate speeds of operation, and are not very prone to flutter, it can still happen—usually after the beginner pilot has soloed and starts performing aerobatic maneuvers with the trainer model at higher speeds. It happened to me; I lost my trainer due to aileron flutter.

Check all screws. I put Loctite on all metal-to-metal screws—from landing gear to fuselage. Don’t tighten any engine screws if you are not familiar with the particular engine and its carburetor. Some of these should not be tight at all while others are torque-and-sequence sensitive.

All wood screws should be tight, too. Use thin cyanoacrylate glue to harden the holes. First, run the screw in the hole so it taps it, then remove the screw and put a drop of thin cyanoacrylate glue in the hole. Wait for the cyanoacrylate glue to fully cure and reassemble the part. These include, but are not limited to, servo screws—the ones that hold the servos to the servo tray—hatches, tail landing gear (most high-wing trainers are not tail-draggers but use tricycle landing gear and don’t have a tail wheel), main landing gear, etc.

Most RTFs come with already assembled engines and landing gear. Usually they are not properly tightened and sometimes they become unscrewed and fall in the box. The result is a model that arrives at the field with screws missing or not tightened. Beginners are not knowledgeable enough to notice or even know how many screws should be used, and are mislead by the Ready-To-Fly advertisement of the product they just acquired.

Check the propeller. Is it the proper size for that particular airplane/engine combo? Is it suitable for training? Small diameter high-pitch propellers provide a lot of speed that is not needed for a trainer model. A typical propeller for a .40-.46 size engine on a trainer plane is 11 x 5.

Next check to see if the propeller is properly attached to the engine crankshaft. The propeller nut should be tight—very tight. The modern engines have hardened crankshafts and use hardened propeller nuts, so don’t be afraid to tighten it. With an electric starter, from a safety and ease point of view, a spinner or spinner nut should be used. It should be tight, too. If the screws holding the spinner cone to the backplate are not tight, the cone will start to vibrate when applying the electric starter and shatter if it is a plastic one.

Check the center of gravity (CG) of the airplane with an empty tank. An improperly balanced airplane is hard to impossible to control. If done at the field and it’s windy, try to find a place where the wind will not affect the airplane’s attitude. Using your fingers is not the most precise method but it works. For most trainers the CG is located at the main spar. Check the CG with the fuel tank empty. When it’s full, the CG is slightly forward. It’s easier to fly a slightly nose-heavy airplane than a tail-heavy one. Most of the fuel is gone by the end of the flight, so the CG goes back to where it was set up with an empty tank.

Check the direction and the amount of control surface deflection. Do not exceed the manufacturer recommended values—they make the model more sensitive to the controls. That, combined with the inherent tendency of beginners to over control the airplane, will lead to aggravation from the student. He or she will be constantly fighting the airplane.

Do a thorough range check with the transmitter antenna fully collapsed and the engine running at idle, half, and full throttle. You can do it while breaking the engine in (if the engine is new). The servos should not twitch when you walk up to 30 paces (60 feet) away from the airplane. Twitching servos might be caused by low battery voltage for the receiver and/or transmitter pack. (Were they charged overnight?)

Break in the engine. ABC/ABN engines normally take one to two tanks before they can run reliably. Ringed engines take longer. Run the engines on the rich side of the needle valve, especially ringed engines. The airplane is ready to fly when the engine can idle and transition reliably.

Some engines (Evolution) are advertised as factory broken in. My advice is to take the time to run at least one tank of fuel through it. After that, if its performance satisfies an experienced pilot, the engine can take an airplane in the air. Keep in mind that the engine will continue to break in until it burns a gallon or two of fuel. How much depends on engine design. During that period, the engine will require some readjustment of its needles.

Leave the maiden flight to an experienced pilot. He will fly the airplane and trim it out. He will also readjust the linkages if necessary when the airplane is back on the ground so the trims can be recentered (if the transmitter is not a computer one).

From the Albuquerque Radio Control Club, Albuquerque NM
Basics of Electric Flight
by Pat Tritle

I really enjoy getting together with clubs and speaking to the group about the basics of electric power. However, because there is so much information that needs to be passed along, it would be difficult, if not impossible, for those attending to remember much of the pertinent information. For that reason, it's better to write up the basic guidelines so that those who are interested in getting into electrics would have the information available for reference at a later date.

Here goes. I'll keep the numbers as simple as possible to avoid unnecessary confusion.

OK, here's how it all shakes out. The basic power required to fly an electric model is as follows:

Direct Drive Systems	60 watts/pound
Gear Drive Systems	50 watts/pound
Mild aerobatic performance	70-80 watts/pound
For all-out aerobatics	100-110 watts/pound
3-D performance	150 watts/pound or more

The above numbers are based on models with wing loadings from 8-16 oz/square foot. As with gas models, higher wing loadings require more power since they must fly faster to support the added weight. By the same token, a lightly-loaded model with a wing loading in the 3-5 oz/square foot range will fly very well at 25 -30 watts/pound.

What's a 'watt'; and where can I get some?
Wattage is the term used in electric flight to relate the level of power that an electric drive system will produce. To relate it to terms we're familiar with, 746 watts = 1 horsepower. To calculate the wattage delivered by a given system looks like this: amps x volts = watts. So where do these numbers come from and how do I know how many volts and amps are needed to fly a given model?

Okay, let's say you want a mildly aerobatic sport model with a 14 oz/square foot wing loading that will weigh in at 2 pounds. We already know that the power requirement for a model like this is about 70 watts/pound, so we're going to need to generate about 140 watts. Let's assume that you are going to use an eight-cell Ni-Cd battery. At 1.2 volts per cell, eight cells will deliver 9.6 volts. To arrive at the necessary current draw to achieve 140 watts, simply divide 140 (watts) by 9.6 (volts) and you arrive at 14.58 amps.

Now, let's assume that you have a three-cell Li-Poly battery for the model, which is rated at 11.1 volts. The formula is the same; 140 (watts) divided by 11.1 (volts) = 12.6 amps. As you can see, as the available voltage increases, the lower the current draw needs to be to deliver the necessary wattage.

Now here's something to consider when selecting your system: the higher the current draw, the shorter the flight duration on any given battery. Therefore, the ideal setup would be to use a higher-voltage battery with lower current draw for maximum duration. On the downside, when using Ni-Cd and NiMH batteries, as the cell count goes up, the weight will increase significantly as well. It works that way with Lithium too, but Lithium batteries are dramatically lighter then the old "round" cells.

Okay, let's say we're going to use an 11.1 volt Li-Poly battery. All we need to do now is select a motor that will swing enough propeller at 12.6 amps to fly the model at a top speed of around 40-45 mph and we're in business. Now that you know the parameters, visit your local hobby shop and select a motor that fits that description.

Gear Drive vs. Direct Drive: Why is one better then the other?

Well, it all depends on the kind of performance you're looking for. If you're looking to go fast, go with direct drive. Going fast requires a high-pitch propeller turning high rpm. The formula to calculate propeller pitch speed is an easy one; it looks like this:

rpm x pitch (in inches)/1056 = mph

Let’s say that you are turning a 7-6 propeller at 14,000 rpm. 14,000 x 6 = 84,000/1056 = 79.55 mph

Now, let’s assume you are setting up a slow, relaxing park flyer with about a 5 oz/square foot wing loading. If we swing a 9-7 propeller at about 3,500 rpm, we’d be looking at a top speed of roughly 23 mph. To swing that much propeller with a small, light drive system, we would use a gear drive unit at a very low current draw and a small, light battery.

Again, to make a known comparison, we can relate all this to riding a 10-speed bicycle. A gear drive swinging a big propeller is like riding your bike in low gear. You pedal like mad with little effort, you don’t go very fast, but you can climb steep hills with ease. The direct drive system could be compared to riding the bike in high gear. It’ll really go fast, and even though you’re pedaling slower, it requires considerably more effort.

What all this boils down to is “propeller disc loading.” We all know what wing loading is: it’s the amount of the model’s weight that each square foot of wing must carry. Prop disc-loading works the same way. A large propeller will be more lightly loaded, thus delivering more torque then a smaller propeller turning high rpm. The tradeoff, of course, will be speed.

One more thing to cover and we’ll give you a rest. Batteries are rated in “voltage” and “amperage.” Voltage dictates the amount of power the battery will deliver. The amperage rating dictates for how long the battery will deliver that power. To relate that to glow fuel, consider the voltage as nitro content. High voltage (nitro) means more power. The amperage is related to the quantity of fuel, or simply the “size of the tank.”

To figure the size of battery needed, let’s go back to our 140-watt sport airplane. If we’re pulling 14 amps from a 1400 mAh (1.4 amp hour) battery, we will have full power duration of five to six minutes. In the real world, with proper throttle management, you’ll see flight times of approximately eight minutes. These are common flight times, even with liquid-fueled models.

To arrive at that number, divide the battery amp rating by the current draw: 1.4 (amp hours)/14 (amps) = 0.1. Then take 60 (minutes per amp hour) x 0.1 = 6 minutes. Now, to double the duration, you must either cut the current draw in half (to 7 amps), or double the battery size (to 2800 mAh or 2.8 amp hours)—again we see tradeoffs. To reduce the current draw, we can use a larger, higher-pitch propeller turning slower with very little weight penalty. If we double the size of the battery capacity, the weight penalty is quite high unless we go over to the new Lithium batteries in which we will discover we have benefited from a tremendous weight reduction, but at a higher price then conventional batteries.

Okay, I promise I’ll quit before we all end up in “system overload.” Once again, there’s a tremendous amount of information here for a newcomer to electrics to digest, so let’s do this: if you have specific questions about setting up an electric model, please feel free to drop me a line and I’ll do what I can to steer you in the right direction. For now, I’ll offer up one last piece of advice. To get started, work with a known good design, and use the recommended equipment that has been proven to work. Talk to the people who are successful and copy what they’re doing. The one thing I do know about modelers is that they are always willing to share their knowledge with those interested in what they are doing.

Contact Pat at: patscustommodels@aol.com

GSLMA MINUTES February 1, 2006

MEETING OPENED: 7:00 PM

ATTENDANCE: AeroPilots, Balsa Busters, Laf. Esq, Lone Eagles, River City Flyers, St. Louis R/C, Thermaleers, Whirley Birds

MINUTES: Approved as published

TREASURER'S REPORT: Old Balance $9311.47 New Balance $ 10,119.87
Buder Permits Issued in Jan. - 96 Year to Date - 132

OLD BUSINESS:

- The proposal on Roberts Rules of Order was not voted due to a procedural issue on how it was introduced. A motion to proceed with the proposal was made from the floor and was seconded. The vote will be taken at the March meeting.
- Chad Dillon of Boy Scouts of America has requested GSLMA to put on displays of R/C and Control Line aircraft at their annual Rocket Launch May 6, 2006. Contact Steve Mizerany if your club is interested (636-225-1076).
- GSLMA Commemorative Brick has been laid in the walkway in Queeny Park.
- Steve Mizerany has a volunteer to build three new benches for Buder Park at $70 each. The benches would be built of Plastic Material. No action was taken pending the expense to repave flying surfaces.

NEW BUSINESS:

- The estimated cost of materials to repave both R/C runways and the 150' x 150' control line flying area is $15,202.00. The current treasury is short that amount by approximately $5000.00. Projections of income from Buder Permits for 2006 is approximately $2000.00, leaving a net deficit of about $3000.00. Several alternative ways of dealing with the shortfall were discussed:
  - Look into raising funds through special donations from the clubs and hobby shops (Club Reps and Steve Mizerany)
  - Look into the possibility of taking a loan to cover the deficit (John Moll)
  - Look into the availability of funding from AMA (Troy Von Kloha)
  - Do the runways and control line area in two consecutive years starting where the need is most urgent.

MEETING ADJOURNED: 7:55 PM

NEXT MEETING: Wednesday, March 1, 2006, at 7:00 PM at the Grand Glaize County Library, 1010 Meramec Station Road.

GSLMA MINUTES March 1, 2006

MEETING OPENED: 7:00 PM

ATTENDANCE: AeroPilots, Laf. Esq., Lone Eagles, River City Flyers, St. Louis Rocketry Assn., Signal Chasers, St. Louis R/C, Whirley Birds

MINUTES: Amended to show Signal Chasers attendance at Feb. Meeting

TREASURER'S REPORT: Old Balance $10,119.87 New Balance $11,125.49
Buder Permits Issued in Feb. - 43 Year to Date - 175

OLD BUSINESS:

- Bob Arata reported that the AA Control Line Event hosted by Laf. Esq. on Feb. 26 was a success. Thirty-five entrants flew in stunt and racing events.
- The vote on Robert's Rules of Order carried
- A separate motion was made to amend the by-laws to show that GSLMA meetings start at 7:00 PM. Motion carried.
- Flying Surface Renovation:
    - Control line users have decided to treat cracks and reseal the asphalt surfaces in that area.
    - A new estimate was prepared by Parks Dept. to reflect the re-seal of Control Line area and repaving of the runways in the R/C area.
    - The new quote still exceeds our treasury by about $2000.00.
    - Projections of income and expenses indicate that we may have enough money by the Fall to cover the new estimate.
    - The possibility of going to a single runway was discussed.
    - Sealing, and not repaving, the runways was also discussed
    - The current boundary line on the R/C field was discussed and recognized as a major problem. This boundary is too restrictive for flight operations of fixed wing aircraft and creates a safety issue which did not exist with the historical boundary line.
    - A motion was made to suspend further discussion of runway improvements until a written use agreement is negotiated with the Parks Department that recognizes the original boundary markers. Motion carried.

NEW BUSINESS:

- Laf. Esq. requested that trees along the walkway in the control line area be trimmed.
- Coming Event: River City Flyers will host a Four Star 40 Pylon Racing Event at their field on May 7, 2006.
- Buder Closed Dates, so far: March 25-26, April 29-30, May 6

MEETING ADJOURNED: 8:02 PM

NEXT MEETING: Wednesday, April 5, 2006, at 7:00 PM at the Grand Glaize County Library, 1010 Meramec Station Road.