The AMA
# INSIDER
The National Newsletter
for Newsletter Editors and Club Officers

VOLUME 3 ISSUE 2 MAY 2007

PRESIDENT TO PRESIDENT

## Security Advisory Reminder

As a service to our members, and as part of our ongoing efforts to work cooperatively with all agencies responsible for the security of our nation, we are providing the following information. The content of this document was last presented on the Academy of Model Aeronautics (AMA) Web site in 2003 and is issued again here for all to review.

In the event you are approached by anyone representing a local, state, or national agency responsible for national security, we recommend and encourage your cooperation.

Once the representatives have established their identity, and any legitimate officer or investigator will do this, cooperate by answering their questions honestly, politely, and with care. Please take these inquiries seriously, and don't forget the impact your answers and attitude could have on your flying privileges, not only locally but nationally.

In addition, some suggestions to keep in mind when flying your model aircraft are:

• Do not fly alone. The chance of being questioned about your actions may be increased if you are seen flying alone.

• Fly only at AMA chartered club facilities or established sites administered by such entities as privately owned, city, county, state, and/or federally owned sites specifically designated for model aircraft operations.

• Make certain that local authorities are aware of any and all scheduled flying events such as fly-ins, contests, etc., including the dates and times of operation.

•Upon request, be prepared to provide personal identification and, if appropriate, a current AMA membership card.

• Always remember to direct any and all questions to the Academy of Model Aeronautics, your national organization, for additional information. We have a good rapport with the agencies responsible and will be more than willing to assist at any level necessary.

please see Security... on page 7

TIPS FOR CLUBS

From the Central Ohio Radio Kontrol Society

## Potential Fun-Fly Events for Your Club

Is you club considering a fun-fly? Central Ohio Radio Kontrol Society has come up with a tentative plan for fun-fly events the club is hosting. Here are some ideas that could help your club create its own fun-fly competition. The events are not written in stone, and can be modified to suit your club's fun-fly.

**"Oh, Crap!":** This one has been done in many different ways but here's a little variation. We call it "Oh, Crap!" With the command "Go," and on the clock, the contestant rolls a pair of dice once to get his 'number.' He or she then must fire up the model, taxi 50 feet, take off, do one loop and one roll, land, taxi back, shut down and then roll the dice again until his number comes up. The crap shooting levels the field a bit, so that the less proficient fliers have a chance against the hot doggers.

**Sudden Death:** Pilot takes off and circles in a pattern until an unknown time period passes. Time starts at an audible signal, and pilot must land as soon as possible. Landing must be on runway. Low time wins.

**Two-Minute Touch-n'-Go:** Time starts at takeoff. Pilot performs as many touch-and-go maneuvers as possible in two minutes.

**Shortest Takeoff:** Pilot tries to take off in the shortest possible distance.

**Hands Off:** Pilot has one minute from takeoff to trim for hands-free flight. At the end to the first minute, the transmitter is laid on a table. Longest E.T. before having to grab transmitter wins.

**Looper**: Most loops in one minute. Timed from takeoff.

**Blind Flight:** Time starts at takeoff; ends at engine stop. Pilot estimates the elapse of one minute. Closest time to actual wins. Requires two timers.

please see Fun Fly... on page 5

March 2007 CONTENTS

# Summer Safety at Your Flight Site

As a new season of flight is underway, the temperature is continuing to rise and health risks are changing. As you prepare your flying site for this summer's events, there are things to keep in mind to keep you and others safe and secure all season long.

It is important that your flying site have its own first aid kit should the need arise.

Everyone should have a well-stocked first aid kit whether it is at home, work, or your club flying site. The contents of your kit will vary depending upon the number of people it is designed to protect as well as special circumstances where it will be used.

When assembling your first aid kit, whether for use in the home, car or at work, you should consider possible injuries you are likely to encounter and then select kit contents to treat those conditions.

It is important to check your first aid kit to see if any of the contents may need restocked either from use or being out-of-date. It's also advisable to have both a stationary kit, as well as a compact portable kit that can be taken quickly to the site of an emergency.

Here are some suggestions for recommended contents for a first aid kit at your flying site:

- Adhesive strip bandages (assorted sizes)
- Adhesive tape
- Alcohol wipes
- Antibiotic ointment
- Baking soda
- Calamine lotion
- Chemical ice packs
- Chemical hot packs
- Cotton balls/swabs
- Diarrhea medication
- Disposable latex or vinyl gloves
- Drinking water
- Elastic bandages
- Face mask for CPR
- First aid guide
- Flashlight
- Gauze pads-various sizes
- Hydrocortisone cream .5%
- Hydrogen peroxide
- Hypoallergenic tape
- Insect repellent
- Insect sting swabs
- Matches
- Meat tenderizer (for insect bites)
- Moleskin (for blisters)
- Needles
- Over-the-counter pain medication
- Paper drinking cups
- Roller gauze
- Safety pins
- Scissors
- Soap
- Splint
- Sugar or glucose solution
- Thermometer
- Tweezers
- Waterproof tape

Guarding yourself from mosquito and tick bites is also important during this season as both bugs can spread disease.

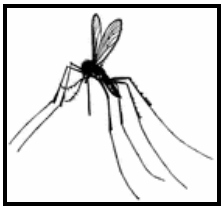
These important facts can help prevent the spreading of these diseases and can help reduce the risk of mosquitoes and ticks ate your flying site.

**The Facts about Mosquitoes and Ticks:**
**Mosquitoes:**

- Only female mosquitoes bite
- Not all kinds of mosquitoes bite humans, many feed on only animals
- Mosquitoes need water to breed. Almost anything that will hold water for one week can breed mosquitoes
- The mosquitoes that carry West Nile virus do not fly far from where they breed.

**Ticks:**

- Ticks are commonly found in shady areas, moist ground litter, tall grass, brush, low tree branches, and along trails in the woods. They are also found in backyards that back up to woody areas.
- Ticks do not fly or jump
- Not all ticks carry diseases
- Ticks must be attached for a few hours to transmit disease



Common Mosquito

**Keep Mosquitoes and Ticks from Ruining You Day:**

- Wear light-colored clothing so that ticks can be seen easily and removed.
- Weather permitting; wear long pants, a long-sleeved shirt with tight-fitting cuffs, and a hat when hiking, camping, or visiting tick-infested areas, or when mosquitoes are biting.
- Tuck pants into socks and shirt into pants, and wear a hat. Pull long hair back.
- When hiking, walk in the center of the trail to avoid overhanging grasses, weeds, and brush.
- Use insect repellant with DEET on exposed skin and products containing permethrin on clothes. Follow label directions. Do not use products that contain more than 10% DEET on children, or more than 30% DEET on adults. Consult a physician before using DEET on infants or pregnant women. Wash treated skin when mosquito and tick exposure has ended.
- Do tick checks frequently during the day and a full body tick check at the end of the day. Use a mirror and check behind ears, behind knees, underarms, and groin. Ask someone to help you check your back and scalp. Take a shower and wash your hair before going to bed.
- Do not sit directly on the ground—use a blanket or towel.
- Remove excess brush and keep grass mowed around your site.

Common Tick

**How to Remove a Tick:**

Grasp the tick as close to the skin surface as possible with fine-tipped tweezers. Pull the tick straight out slowly.

Wash and treat the bite area with a disinfectant. See your doctor if you develop early symptoms of tick-borne disease within the next 30 days.

Tick-borne diseases can be treated with antibiotics, but early treatment is important. Serious illness or death can occur if not treated promptly.

DO NOT squeeze the tick, twist the tick, light the tick on fire, or cover the tick in petroleum jelly, nail polish, alcohol, or kerosene. These "home remedies" may increase the chances of transmitting the bacteria and becoming infected with a tick-borne illness. ✈

*—Information provided by survival-center.com and the Gerogia Division of Public Health.*

From the Monmouth Model Airplane Club, Inc., Keansburg, New Jersey

# Li-Poly Battery Basics

by Paul Gentile

The popularity of electric-powered aircraft has soared (pun intended) over the past few years. Part of the reason behind the recent popularity has been the advent of Lithium Polymer or Li-Poly batteries.

Li-Poly batteries pack a high energy-to-weight ratio when compared to their Ni-Cad and NiMH battery cousins. This stored energy has good and bad potential, and we will touch on both here.

Li-Poly battery cells are 3.7 volts, as compared to Ni-Cad and NiMH batteries which are 1.5 volts per cell.

When Li-Poly batteries are wired in parallel, they do not discharge like other batteries. In addition, when you wire cells in parallel, each cell only sees half the total current, or amp draw.

Total current is very important for Li-Poly batteries and is identified with a C rating. You may see Li-Poly batteries advertised as 3C, 6C, 8C, 10C.

This means that a 3C 1500 mAh (1.5 amp) Li-Poly battery pack should never be discharged at a rate higher than 3 x1500 mAh or 4500 mAh (4.5 amps).

Discharging a Li-Poly beyond this rating could cause damage to the cells or even fire. A very serious concern.

Changing a propeller on your airplane can change the current draw and cause higher than expected discharge rates. So it is beneficial to have a current meter on hand. The manufacturer's specifications for the motor, speed control, and propeller combination you are running also come in very handy.

The other letters on Li-Poly packs refer to S for serial wiring of cells and P for parallel wiring of cells.

A 3S pack would be 3.7 volts x 3 cells = 11.1 volts. A 3P pack would mean three parallel cells, or 3.7 volts and a higher C rating. A 3S 3P pack would have 3 cells in serial (11.1 volts) and 3 cells in parallel.

Li-Poly batteries also do not require cycling, or discharging like other batteries. In fact, you never want to cycle down Li-Poly batteries. You should always leave a partial charge, to avoid damage.

Chargers and speed controls should always be rated for Li-Poly use. Do not attempt to use your Ni-Cad or NiMH equipment. An improper charge rate could cause a Li-Poly pack to explode and burn at over 2000 degrees. A non Li-Poly rated speed control could cause over discharge and cell damage.

Here is a list of dos and dont's for your Li-Poly packs:

- Never put your Li-Poly packs in water and never put water on the packs.
- Don't leave your Li-Poly batteries unattended while charging. See www.modelaircraft.org for this year's list of people whose cars and houses have burned down while leaving packs unattended during charging.
- Don't puncture or short out Li-Poly batteries.
- Don't fully discharge your Li-Poly packs, this will damage the cells.
- Don't put the Li-Poly battery in your car, or leave it in your airplane after a crash. If the battery is damaged internally, you may not notice. According to the AMA, several members' cars have already burned up this year due to this scenario.
- Do use common sense and respect the energy that is stored in that little package.
- Do follow all manufacturer ratings and specifications for use and storage.
- Do store your Li-Poly packs in a fire-proof container.

Li-Poly batteries are used everyday safely in cell phones, laptops, consumer electronics, and iPods. In our hobby, we are pushing these batteries to their limits, charging and discharging them at high rates and sometimes smashing them into the ground at high speeds. We need to respect their potential and keep it safe.

Enjoy the power and convenience of electric flight with Li-Poly batteries; I do. Just respect the energy stored in that little Li-Poly package and it will reward you with some of the fastest, 3-Dest (if that is a word), most fun flying you will have. ✈

**Li-Poly Quick Reference**
C = Current
S = Serial
P = Parallel

**Li-Poly Cell Voltage**
Cells x 3.7 = voltage
1 cell = 3.7 volts
2 cells in series = 7.4 volts
3 cells in series = 11.1 volts

mAh = milliamp hour rating of a battery's capacity under load. 1000mAh = 1 Amp

# New Modification to the Leader Club Program

April 21, 2007 AMA's Executive Council modified the long-running, well-received AMA Leader Club Program to provide access to clubs that have been denied participation in the past.

The program's required activities have been a hindrance to some otherwise worthy clubs being recognized for their efforts.

Consequently these requirements have been modified as follows:

1. Must be an AMA chartered club for a minimum of five years.
2. Club membership must be open to all AMA members and not limited to a certain number.
3. Club must develop and post Safety and Operational Rules at its flying site.
4. Club must file a copy of Safety and Operational Rules at AMA Headquarters.
5. Flying field must have separate areas for fliers and spectators, clearly marked as such.
6. The AMA Safety Code must be posted and visible at the club field.

Program Requirement Modification: For a deserving club to be considered for Leader Club status its District Vice President may waive one of the above requirements for participation.

The revised application is posted at www.modelaircraft.org, PDF Documents, Number 708. Please contact Erin Dobbs, erind@modelaircraft.org for questions. ✈

From the Hi-Sky RC Club, Midland, Texas

# Setting Up Your Airplane

by Henry Smith

Generally speaking, "setting up" refers to a new or never-flown airplane. It is also applicable to any airplane whether you purchased it from an individual or it is one that doesn't fly as well as it should.

There are three things to consider. The first thing is how straight the airplane is. The second is it balanced? And, last but not least, where is the center of gravity? Some of the material in this can be ignored for almost-ready-to-fly (ARF) and ready-to-fly airplanes (RTF) because you can't control them.

**Bananas, Warps, and Twist:** Most, if not all, kit instructions state something to the effect that you don't want to build a "banana." This means simply that the fuselage must be built straight. You can do this by building and gluing the fuselage in a jig or build over the plans keeping the center line true.

I prefer to use a jig so I have the centers held on a straight line until the glue sets. If it's an ARF, a mixture of ammonia and water soaked into the wood may allow you to correct the problem.

A better arrangement is to try for a replacement from the local hobby shop or the distributor. A ready-built airplane bought from an individual may require some cutting, patching, and reglueing.

You may have read a statement similar to this in kit-building instructions that good flight performance starts with a straight, warp-free wing. If the wing is warped but not covered, again the ammonia and water soaked into the structure may work. Simply soak the wing panel, twist opposite the warp and hold for at least 24 hours, then check for straightness.

Again, I prefer to use a jig to build wings. The jig keeps the warps almost completely out. If the wing is covered, heating the covering may pull the warp out.

**Tech Editor's Note:**
All of this is true, BUT, you must be careful you are not removing a deliberate warp built into the wing called washout, that helps prevent tip stalls. Washout makes the angle of attack slightly "steeper" at the wing tips than at the root of the wing. This designed "twist" in the wing of an airplane is used to delay the stall of the wingtip until after the wing root stalls. When the root stalls first, the aircraft simply pitches nose down with the wings remaining essentially level. Recovery, then, is simple, providing you are at a high enough altitude to allow recovery. Always try to fly at least two mistakes high.

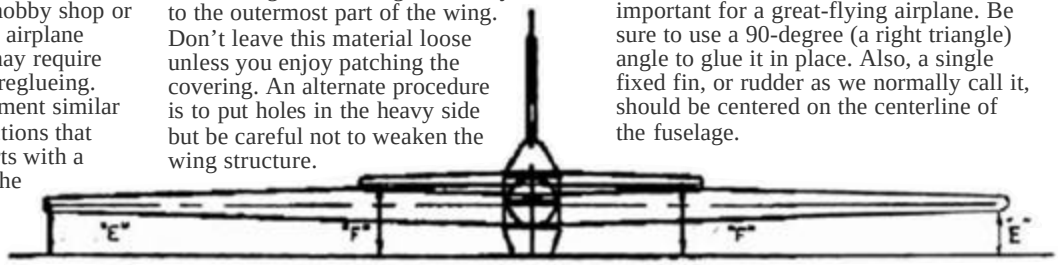
To check for washout, look at both tips with the wing laying flat on the building board.

**Editor's note cont:**
With the trailing edge at the middle of the wing held down on the board, both wingtips should be slightly elevated above the board. If neither tip is elevated, then there is no washout built in.

If one tip is elevated and the other not, or even depressed, then you have a serious twist in the wing that has to be removed. Such a twist would cause a snap roll when one tip stalls before either the other or the center of the wing.

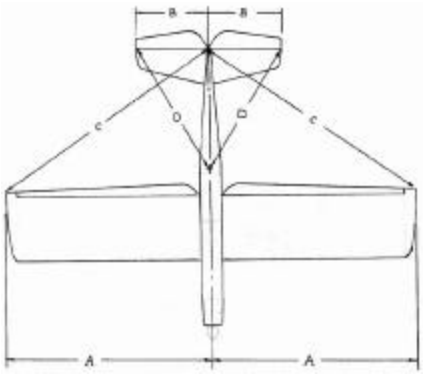
If both tips are depressed, which would mean that when you put the wing on the board, the tips would touch the board and the center trailing edge would be elevated, you have "washin," which is very difficult, if not impossible, to fly with, so you must not attempt to fly with such a condition.

This is a good time to check the wing for balance. Place the wing on a stand that supports the wing in the center such that the dihedral points down. Add weight to the lighter side using lead, nails, or other materials until the wing balances. Be certain to glue this weight securely to the outermost part of the wing. Don't leave this material loose unless you enjoy patching the covering. An alternate procedure is to put holes in the heavy side but be careful not to weaken the wing structure.




**Alignment:** The manual for the kit or ARF should cover how to assemble the stab, vertical fin, and wing to the fuselage so the model is straight. It should be very much like the diagrams. Some instructions do not have a diagram covering such as this, only a printed statement.

I think a diagram is better. You can see on the diagram what you must do. Keep in mind that all dimensions "A" must be the same, all dimensions "B" and so on. You will have to move the wing or stabilizer several times to get them the same. The important thing is that you are on the centerline of the airplane.




A seamstress tape is handy for measuring. You can drill a small hole in the metal end and anchor it on the fuselage with a "T" pin. You may have to sand the wing or stab saddle to make the dimensions "E" and "F" correct. Some kit instructions omit these measurements. But this step is important, so be sure you get it correct. Do not neglect it.

**Tech Editor's Note:**
A seamstress tape is handy, but it also stretches, which means that the measurement you make may not be repeatable. The longer the tape, the greater the error. Your measuring device should be of metal or wood construction, and stiff enough to make sure it doesn't sag or at least make sure you support it during measuring.

There is no reference to the vertical fin on either diagram. Its alignment is very important for a great-flying airplane. Be sure to use a 90-degree (a right triangle) angle to glue it in place. Also, a single fixed fin, or rudder as we normally call it, should be centered on the centerline of the fuselage.

**Radio Installation:** We have the airplane straight. Now let's look at the radio installation. Generally you can follow the kit manufacturer's directions. They may have a recommended location for the servos.

I generally try to follow the directions. They have been worked out and usually are good. Don't mount a servo such that the pull is from the side (an exception is the throttle servo). This arrangement causes the servo to rock and flutter may result. The pull on the servo lengthwise avoids this rocking movement.

The linkage from the servo to the control surface must be straight and stiff. You don't want any flexing here. Don't use balsa for pushrods. It may break at a bad time causing a crash. There are better materials to use.

The servo arm and control arm should be at 90 degrees to the pushrod. The length of the servo arm and control horn

please see Setting Up... on page 7

From the Hi-Sky RC Club, Midland, Texas

# Cutting Propellers for Electric Models

by Dennis Robbins

Electric-powered airplanes are continuing to gain popularity, which can easily be seen in the abundance of kits, motors, speed controls, and accessories.

The availability of supplies used in the electric world of RC is making the construction, setup, and flying of these hobby wonders so easy almost anyone can have an electric airplane in the air in just a few hours.

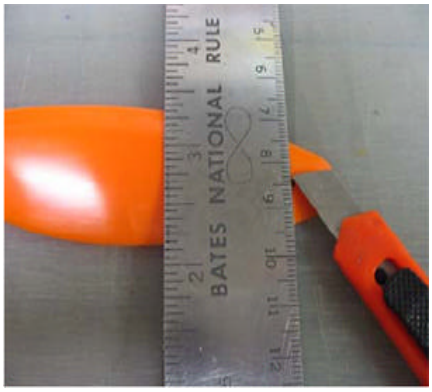
Sometimes, even with all the available supplies, you still have to make or modify your own parts to get exactly what you want, and that leads us to this article about cutting propellers.

There are a number of different propellers made for the electric enthusiast, but what if you need one that is not available, or perhaps you want a prop that has maybe a little less diameter than the ones readily sold in the hobby stores? What if you have a nick out at the end of the propeller or perhaps you prefer a certain pitch, but not the diameter? Why not modify them yourself?

Here is how I cut and modify my propellers for slight modifications in the performance of my aircraft. By reducing the diameter from 10 inches to 9 inches, greater propeller clearance and reduced airspeed were attained for a particular airplane. ✈

Stock 10-inch x 4.7-inch slow-fly propeller.


Measure 4.5 inches from the hub and mark.




Cut propeller using straight edge.

Cut but not sanded. Snap along the knife score mark.

Sand to desired shape.

Balance propeller after any modifications.

## Fun Fly... continued from page 1

**Climb n' Glide:** Pilot is given 30 seconds after takeoff to climb high as possible. At 30 seconds, the engine is stopped. Throttle is advanced to prove dead engine. Landing must be on runway. High time wins.

**Scrooge (and Looping Scrooge):** Pilot fuels EMPTY tank from 15cc syringe. Longest time in air wins. (Add 10 seconds to time for each loop performed.)

**Musical Airplanes:** Fill the sky with old airplanes. A horn is blown, and all aircraft must land, Last one down is eliminated. Continue until all but one airplane is eliminated.

**Spin Down:** Pilot has one minute from takeoff to climb to altitude and begin to spin. Airplane must land on runway. Greatest number of spins wins.

**Fast and Slow:** Airplane flies a straight course twice. First pass is for all-out speed. (Diving airplane is allowed.) Second pass is flown slowly as possible, maintaining reasonable altitude and course. Largest difference in the two times wins.

**Dice Roll:** Six maneuvers are chosen and numbered 1-6. The pilot rolls one die to choose a maneuver, the rolls it again to choose the number of times the maneuver must be flown. Time begins at first roll and stops upon touch down.

**ETA:** Draw times from a hat. Flier removes watch and takes off. Estimate time and land. Closest to actual time drawn wins.

**Dead-stick landing:** Mark a spot on the runway. Pilot takes off, gains altitude and kills engine. Land and roll to the spot. Closets to target wins.

**Dixie Death:** Shortest time to takeoff, do three each, rolls, loops, and spins (in any order), then do a touch-and go-then do three rolls, loops, and spins (in any order), then land. Stop watch starts when airplane leaves the ground and stops at touchdown. ✈

# Do You Have an Itch to Scratch? **continued from *Insider* Jan. 2007**

by Bill Bowne

**Part II: Sport Planes**

Okay, so you want to go whole hog and roll your own. First, you need to decide if you're going to do a Scale or sport model. For a Scale aircraft, you have to approximate the shape of the full-scale design. How closely you duplicate it is your decision. Of course, if it isn't Scale, you have a lot more leeway.

Everybody will find something wrong with the outlines, colors, or markings on a Scale model of a P-51, but nobody can find them on an Ugly Stik! Besides, designing your own sport model is good practice for drawing up that dream Scale model. So, this episode, we're going to talk about sport airplanes.

First, though, let's get a few definitions out of the way. I'm not trying to insult anyone's intelligence, but some of our folks don't know what these terms mean. They may not ask, but I know I've seen some blank looks when those terms are brought up.

Let's take a moment to quickly cover a few:

**Wingspan:** Distance from wing tip to wing tip. When the wing tips are curved, it's a good idea to estimate how much area is left out by the tips and decrease the span used in calculations accordingly.

**Wing Chord:** Distance from the wing's leading edge (front) to its trailing edge (rear). We will use average chords a lot. When calculating the average chord, use the chord at the center of the fuselage, not at the wing root for the center chord. For the tip, use your judgment as to how much to knock off curved tips to make a reasonable tip chord.

**Wing Area:** The area of the wing, including those parts covered by the fuselage, nacelles and so forth. The area, mathematically, is equal to the average chord times the span.

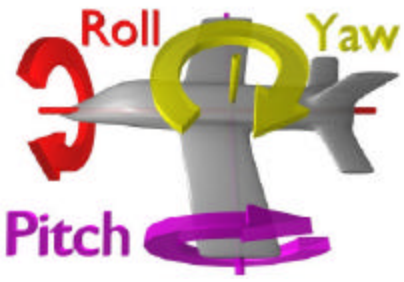
**Wing Loading:** The wing area of the airplane (in square feet) divided by the weight (in ounces). This can really vary between models. Wing loadings that are fine for quarter-scale models are prohibitively heavy for smaller models, for example. The lighter the wing loading, the slower the model can fly and the more maneuverable it can be. On the other hand, a lighter wing loading will also increase the model's vulnerability to wind and turbulence.

**Aspect Ratio (AR):** The relationship between the wingspan and the average wing chord. The higher the AR (i.e., the longer the wingspan is compared to the chord), the more efficient the wing usually is. That's why gliders have such long, thin wings.

On the other hand, the longer the wing, the slower the airplane will roll. Long wings have a lot of inertia to overcome. Think of the wings as being like a figure skater's arms; the further out they stretch, the slower she pirouettes. So, aerobatic airplanes have shorter wings and can roll faster. Very short aspect ratios, such as ones on circular airplanes like the famed F5U Flying Flapjack give models great maneuverability, but woe to the pilot if the engine dies as the glide is essentially non-existent.

For typical models, Aspect Ratios normally run from 5:1 to 6:1. We're going to compromise and go with 5.5:1. (In Air Force tech school, this is where the instructor would usually stomp his foot on the floor a few times.)

**Center of Gravity (CG):** Most folks think this is only the line the airplane balances on when held by the wingtips. WRONG! The CG is a three-dimensional balance point. An airplane will balance on that point, no matter what attitude it's in. When the airplane yaws, it yaws around the CG; when it rolls, it rolls around the roll axis. Ideally, we should balance each model at least on the pitch AND roll axes, not just the usual pitch axis. In the picture below, the CG (not marked) is where the three axes intersect.




Enough theory, what do we do with this stuff?

I use a set of rules to determine the basic proportions of every model I design. These rules were originally compiled by the late Chuck Cunningham. Chuck was a columnist for *R/C Modeler* magazine for many years and designed several models, including the well-known Lazy Ace.

Ok, so what did Chuck do that was so great? Simple, he looked at what worked. Chuck compiled the proportions of many successful RC models and averaged them out. He then created a series of nomograms from the averages and wrote a series of articles on using them. Those articles were published in *RCM* every couple of years for decades. I took the articles and converted the nomograms back into equations, which I now use in a spreadsheet.

Do you need to use a spreadsheet? No, but it is a faster way to calculate things and lets you quickly make a lot of "what if?" comparisons.

What you really do need are the proportions. With them, all you need to do is set the wing area and do a little calculating. These proportions are based on the most common sport model aspect ratio (AR) of 5.5:1. (Gee, where'd we hear that?...)

Here are the proportions for monoplanes (see page 9). Remember that these are for "average" models. If you want to design a 3-D airplane, you'll need to increase the sizes of the control surfaces relative to the flying and tail surfaces.

Once you have the area and the aspect ratio, all else follows.

Okay, but how big a wing do you need? That's a good question. You need to look at how heavy the model will be and what kind of wing loading you can live with. Be realistic about how lightly you can build a model. A good way to get a guess is by looking at kits and plans you and others have done.

Let's assume you decide your airplane will weigh 5 lbs. and that you'd like the wing loading to be 24 ounces per square-foot.

1. Convert the weight to ounces. 5 lbs. multiplied by 16 ounces/lb makes 80 ounces.
2. 80 ounces divided by 24 ounces per square-foot produces 3.33 square feet. At 144 sq. inches per square-foot, that's about 480 square inches.
3. With an aspect ratio of 5.5:1, the average chord is the square root of 480/5.5, which equals about 9.34 inches. The span is then 9.34 times 5.5 = 51.4 inches.
4. Now, use the proportions from the table to calculate the proportions you'll need.

please see Itch to Scratch... on page 9

# Security....continued from page 1

Establishing a good working relationship with such agencies is important not only to our national security but to the efforts put forth to maintain our privilege to continue participating in the sport we all cherish.

**Media Advisory**

In today's tense atmosphere of terrorist threats, possible military actions, etc., there appears to be exuberance on the part of news agencies and individual reporters to gather information concerning the use of model aircraft as possible security risks. Many times, in an effort to take advantage of the opportunity to garner some public exposure for their local flying activities, the members are surprised when the news release does not resemble what they had assumed would be published. This results in negative press for the sport and local participants, and may spread misinformation.

As a service to all AMA Chartered Clubs, we are suggesting that if you or your club are contacted by TV, radio, newspaper, or Internet reporters for interviews other than coverage of such activities as fly-ins, mall shows, airport awareness days, etc., you direct them to the AMA Headquarters for information. If in doubt please error on the side of caution.

Our main purpose for the Advisory was to bring the matter to the attention of our members and remind them of how important it is to be cautious when giving interviews during these times. We are all aware of how communications can be misunderstood or misinterpreted and how reporters can sometimes inject their own perceptions. All we can ask is that anyone speaking on behalf of our modeling activities be aware of what the consequences of their words might be.

At any time please contact Jay Mealy at AMA Headquarters with questions, comments, or concerns. ✈

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# Setting Up....continued from page 4

should be the maximum, while still giving the required control surface left/right or up/down movement. If you do all this, you will take advantage of the servos power and not have to go beyond the normal movement of that servo.

Before we leave the radio installation, we have to set up the throttle linkage. The mechanical linkage can be one of numerous ways. I have seen a solid wire, braided wire, and a tube within a tube. Of course the wire is enclosed within a tube to prevent rubbing the fuel tank. All of these work fine for this application.

Be sure to secure the outer tube to the side of the fuselage. The throttle arm will travel approximately 90 degrees. Before the engine is mounted in the airplane, check that the throttle travel is equal fore and aft when open and closed.

Select a servo arm that has approximately the same length as the throttle arm. It may take some trial and error work to see that the throttle is closed at the lowest setting of the throttle trim and fully open at maximum throttle throw. The final adjustment will be when you start the engine the first time.

**Tech Editor's Note:**
It would be best if there were no metal-to-metal contact at the throttle. The engine is the source for most of the vibration in a model aircraft and vibrating metal can cause radio waves capable of interfering with the signal from your radio and receiver. With modern radios, there isn't likely to be a problem, but better safe than crashed.

**Tank Position:** The lowest position of the centerline of the fuel tank should be no more than 1/2 inch below the engine's needle valve. The highest position of the centerline of the fuel tank should be at the needle valve. Any higher and the engine will load up at idle with a full tank and go too lean when the tank is nearly empty.

A high tank position will result in flooding and difficult starting. If the tank is too low, the engine will lean out towards the end of the flight and not hold a constant setting.

The tank should be as close to the engine as possible. The fuel lines should be as short as possible. A longer line is easier to grab but remember that engine has to pull fuel from the tank with nothing but the low pressure from the venturi. The tank should be surrounded with foam rubber to prevent foaming.

**Center of Gravity (CG):** We are now ready to consider the center of gravity. This is a very important step in getting your model airplane ready to go. Be sure you have the model with engine, radio, empty fuel tank, and all pushrods connected.

If you forget it or neglect this step, chances are the test flight will not be a fun time. If it is too nose heavy, the model won't fly well. If it is too tail heavy, the maiden flight may be short.

The plans or instructions should have the CG identified as a range. This range is a distance measured from the leading edge of the wing. This will be in inches or millimeters depending upon where the kit was made. Take a small strip of covering and mark the location(s) so you won't have to measure a number of times.

I recommend for the first few flights that you have the CG in the forward half of the range. Try to balance the airplane by moving the servos and battery. Avoid adding weight if at all possible. A high-wing airplane will be balanced upright, while a low-wing airplane will be balanced upside down.

Now is a good time to check the lateral balance of the airplane. Remember we balanced the wing before. Now we will check the entire airplane. As before, if the airplane drops a wing, add some weight to the opposite wingtip. This should be a minimal amount of weight because of our earlier work.

If you followed all that we discussed, you will have a straight and well-balanced airplane that is ready for its checkout or maiden flight. There should be few surprises on that first flight.

Set the control throws per the specifications on the plans or manual. If your transmitter has dual rates, set the low rate at 70-75% of maximum. The test pilot may prefer to make that first flight on low rates to minimize surprises.

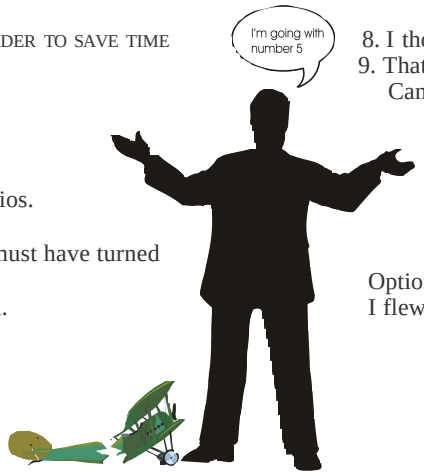
Good luck and enjoy flying your new airplane. ✈

From the D.C. Radio Control Club, Montgomery County, Maryland

# Table of Excuses

PLEASE GIVE EXCUSE BY THE NUMBER IN ORDER TO SAVE TIME

1. I didn't know you were waiting for the pin.
2. Did you see my airplane get glitched?
3. I ain't got it.
4. I have more crashed because of bad radios.
5. That airplane was always squirrelly.
6. I don't know who did it, but someone must have turned on their transmitter and shot me down.
7. I just lost control; everything went dead.




8. I thought I was on the field.
9. That's that only time I ever left my transmitter on. Can you help me pick up the pieces?
10. I didn't know you were in the landing pattern, next time I'll look before I taxi out. Do you think it can be repaired?

Optional- I didn't realize I was that low when I flew over the pit area. Is three models a record?

## Tips & Tricks

### Measuring Washout

Washout, the downward twist in wingtips that improves low-speed flight, is sometimes used in airplanes with flat-bottom wings. A good way to make sure each wingtip has the same amount of washout (or any at all) is to get two straight dowels or carbon rods. Tape each to the bottom of the wing near the tips.

Set the wing on something so you can see both rods, and sight down the wing so you can see each rod in relation to the other. The rods magnify any angle that might be present in the wing.

Correct the wing twist until you have the angle you want. This doesn't work too well with wings that are rounded on the bottom, but is an excellent way of making sure the flat-bottom wings are true.

### Propeller Hang

This is probably one of the more difficult maneuvers to master, but once you get it right, it is probably one of the most spectacular. The object is to fly along slowly then pull to a vertical position, allow the speed bleed off giving it throttle to keep the model in a stationary vertical position.

Keeping the model in a vertical state while hovering still requires a lot of work with throttle, rudder, elevator, and a little aileron, the torque from the motor tends to make the model start torque rolling.

Practice this at a safe altitude and once you can hold your aircraft in a stable propeller hang as well as be able to fly out of the maneuver without losing any height, you can slowly start practicing at a lower and lower altitude. This maneuver requires enough power to be able to climb vertically out.

*—both from the Suffolk Aero Modelers, Bay Shore, New York*

### Scrap Aluminum

One of the most useful and inexpensive tools in the workshop are pieces of scrap aluminum angle iron cut to various lengths and of various sizes. I find that a selection of 1-inch, 2-inch, and 3-inch pieces, varying in length from one to six inches are quite helpful, and these can be obtained at a metal supply shop.

If you have a metal fabricator near you, you might try asking him to sell you some scraps of angle about these sizes. Since these lengths are considered trash to these fellows, you may get lucky and get them for free. Even if you don't, the cost should be minimal, and as useful as these are, I would have purchased new stock and cut it up into pieces to obtain these tools.

What good are they, you ask? Well, here are a few of the things I use them for and I'm sure you can come up with more once you start using them. First off, this is a great way to align the table on disk/belt sanders, drill presses, band saws, etc. You can use them to hold items to be glued or drilled exactly perpendicular to the work surface, such as drilling into the edge of sheeting, or holding ribs at 90 degrees to the table while your adhesive dries.

*—from Mark Kallio, Balsa Chips, Milford Connecticut.*

### Installing Control Horns

Your airplane is done and covered and now we have to put holes into that perfect job you've done. That's not bad because the horn and base will cover them. But, now we have to take a small, fine-head Phillips screwdriver and struggle getting those little self-tapping screws to bite on the back. It will happen, the driver slips off and a third hole is in your covering. Here is the tip and kind of input we can all use. Simply take a piece of cardboard, or plywood if you wish to make it permanent, trace the outline of your horn, trim it out, place over the horn and you have eliminated that possible third hole!

*—from John Neilson, the Sun Valley Fliers, Phoenix, Arizona*

**GLAD Press 'N Seal** plastic wrap makes a great masking medium for spray painting. It is sticky on one side and will stick to itself, or the item you want to paint. It is much easier to work with than paper because it clings to the surface without lifting the paint off when removed.

*—From Flightline, Casper Airmodelers Association, Casper, Wyoming*

## Save that stamp!

If your club newsletter is sent to AMA electronically there is no need to send a hard copy.

E-mail your newsletter to lhelms@modelaircraft.org

# Itch to Scratch part 2...continued from page 6

For our project we get the numbers below.

The first thing you might notice is that the numbers for the fuselage don't quite add up; the sum of the wing and tail chords, plus the nose and tail lengths is actually about 38.25 inches, not 38.5. What gives? That's due to rounding when calculating. The error is about 1/4 inch over the length of the fuselage. We can ignore this. These numbers are NOT hard rules that must be obeyed to the last decimal point! Remember, these proportions are all based on AVERAGES of successful models, so there is leeway.

Okay, so now you know how big the areas must be, how far apart the tail and wing must be, and so forth. How do you convert these numbers into airplane drawings? Well that's going to be the topic for next month's article, so we'll wait until then, okay? ✈

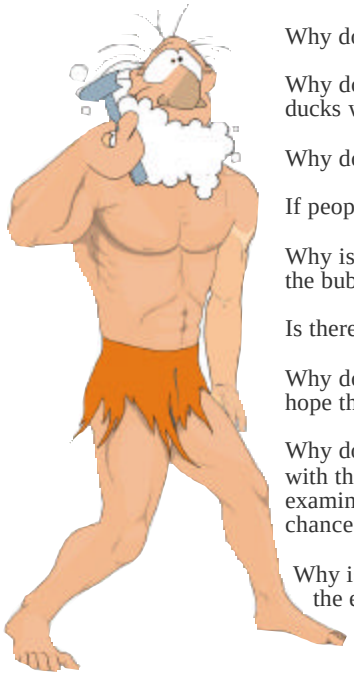
| | |
|---|---|
| Average Wing Chord | 9.34 inches |
| Span | 51.4 inches |
| Aileron Area (@) | 28.8 sq. inches |
| Total Fuselage Length | 38.5 inches |
| Tail Length | 14.5 inches |
| Nose Length | 8.7 inches |
| Horizontal Stabilizer Area (including Elevator) | 96 sq. inches |
| Elevator Area | 19.2 sq. inches |
| Horizontal Stabilizer Average Chord | 5.7 inches |
| Horizontal Stabilizer Span | 17 inches |
| Vertical Stabilizer Area (with rudder) | 40.8 sq. inches |
| Rudder Area | 16.3 sq. inches |

**PROPOTIONS FOR MONOPLANES**

| | |
|---|---|
| Average Wing Chord | Square root of (wing area divided by aspect ratio) IMPORTANT: Divide the area by the AR FIRST, then take the square root! |
| Span | Aspect ratio times average chord |
| Aileron Area (@) | 6% of the total wing area PER AILERON |
| Total Fuselage Length | 75% of the span |
| Tail Length | 37.5% of the total fuselage length |
| Nose Length | 16.875% of the total fuselage length, from the wing LE to the back of the propeller |
| Horizontal Stabilizer Area (including Elevator) | 20% of the wing area (this includes the elevator) |
| Elevator Area | 20% of the horizontal stabilizer area |
| Horizontal Stabilizer Average Chord (Aspect Ratio of 3:1) | Square root of (the horizontal stabilizer area divided by 3) |
| Horizontal Stabilizer Span | 3 times the horizontal stabilizer average chord |
| Vertical Stabilizer Area (with rudder) | 8.5% of the wing area. IMPORTANT: This includes the area of the fuselage side that is under the horizontal stabilizer! |
| Rudder Area | 40% of the vertical stabilizer area |

From the Central Arizona Modelers Inc., Sedona, Arizona

# Questions for You to Ponder



Why doesn't Tarzan have a beard?

Why does Superman stop bullets with his chest, but ducks when the bad guy throws a revolver at him?

Why do Kamikaze pilots wear helmets?

If people evolved from apes, why are there still apes?

Why is it that not matter what color bubble bath you use, the bubbles are always white?

Is there ever a day when mattresses aren't on sale?

Why do people constantly return to the refrigerator with hope that something new to eat will have materialized?

Why do people keep running over a string a dozen times with their vacuum cleaner, then reach down, pick it up, examine it, then put it down to give the vacuum one more chance?

Why is it that those plastic bags will never open from the end on your first try?

Whose idea was it to put an "S" in the word lisp?

# 2007 Flying Site Grant Winners Announced

This year AMA gave away more than $32,000 to clubs that participated in the Flying Site Development Improvement Program.

The list of winners is posted on the AMA Web site at www.modelaircraft.org/07fsgrantlist.asp

Applying is so easy! The application and instructions are located on the AMA Web site in PDF format at www.modelaircraft.org/PDF-files/712.pdf or you can call (765) 287-1256 ext. 270 or 272 to receive a copy.

Although grants have already been awarded for 2007, you can apply for 2008.

Congratulations to all of the clubs that received grant money. For those that did not, we extend our best wishes for a successful 2007 flying season and we hope you apply again next year.✈

## AMA Vision

We, the members of the Academy of Model Aeronautics, are the pathway to the future of aeromodeling and are committed to making modeling the foremost sport/hobby in the world.

This vision is accomplished through:

- Affiliation with its valued associates, the modeling industry and governments;
- A process of continuous improvement;
- A commitment to leadership, quality, education and scientific/technical development; and,
- A safe, secure, enjoyable modeling environment.

## AMA Mission

The Academy of Model Aeronautics is a world-class association of modelers organized for the purpose of promotion, development, education, advancement, and safeguard of modeling activities. The Academy provides leadership, organization, competition, communication, protection, representation, recognition, education and scientific/technical development to modelers.


### ABOUT THE AMA INSIDER:

The Academy of Model Aeronautics' *AMA INSIDER* is published electronically on a bimonthly basis for members of the Academy of Model Aeronautics. Its purpose is to create a network of information exchange between the Academy of Model Aeronautics-chartered clubs as well as the Academy of Model Aeronautics officials and chartered clubs.

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