



## PRESIDENT TO PRESIDENT

# Field Safety and Accommodation

by Dave Brown, AMA President

It's winter and as president of a club, most of our attention is focused on indoor meetings, programs for the club membership, and planning for next season's activities. Think about taking a break from this and give some thought to a safety review of your flying site.

Why should you consider this in the middle of the winter? Winter is a good opportunity to see many things that are not visible during the spring and summer when the grass has grown. A safety concern such as a gopher hole hidden by grass could cause a member retrieving his model from a less-than-perfect landing to trip and be injured. Look for anything that could cause a problem and schedule the repairs necessary to bring the site up to snuff.

**How do you** respond to a member who thinks you are discriminating against him or her when you make rules for the operation of your flying site?

It's not discrimination for your club to rule that your site is restricted to—or from—

a particular type of model. A number of clubs prohibit gas-powered models because of noise in order to protect the site.

Other clubs don't allow helicopters at the site unless they fly in the same pattern as a fixed-wing model. A helicopter hovering over the runway for an extended time effectively shuts off the site for others flying fixed wing models. Hovering 3-D fixed wing flying creates many of the same problems, and some clubs limit or prohibit this form of flying.

Let's face it, the fewer rules we impose on our members, the better, but rules are necessary to make sure the flying site can be used equitably by the majority of the membership. The secret is to make those rules as fair as possible and to make every effort to create—if necessary—a facility for any discipline of modeling which the membership wants to pursue. A hovering pad, offset from the main runway, can go a long way toward solving many problems as can scheduling time when people can fly 3-D without interfering with the mainstream

members' use of the field.

It comes down to making an effort to accommodate the interests of each of your members, but recognizing that you may not be able to accommodate every activity. The secret to success lies in making an effort to indulge those members with different interests. Sometimes you simply cannot accommodate a particular type of model but it has been my experience that if you *have* made an effort to do so, that member will understand the situation and support your decision.

Part of the strength of our great sport is the diversity of types of models we can become passionate about, but that diversity presents challenges when it comes time to accommodate them at the flying field. With a little effort on the part of modelers who want to do something different and the club officers charged with making order out of this sometimes-chaotic sport, we can all share facilities. This will benefit all of us individually as well as the club and the sport. ➔

## TIPS FOR CLUBS

# Club Officer Protection

**Question:** Our club officers recently entered into a discussion on what protection the AMA provides for them, if any, above the standard AMA member coverage when acting as officers of the club. I cannot find many details in this area, except for where the club charter kit (page 12) refers to this subject stating the following:

"B. FOR PERSONS—as to liability for conduct associated with the club/chapter activities. Such persons include:

1. Any chartered club/chapter officer (each of whom must also be an AMA member) as defined in the scope of the position and in the performance of related duties."

Can you further elaborate or refer me to where I can find information on the exact coverage applied to the club officers?

**AMA Response:** Club officers have the same coverage as all AMA members. That coverage is \$2,500,000 per occurrence (accident). The AMA policy does insure the "vicarious" liability (that is the officer's responsibility for acts of others) or direct liability exposure for allegations of negligence resulting in injury or damage.

An example of this might be an accident injuring another member and the injured member makes a claim or suit against both the pilot causing the accident and club officers for failure to maintain site safety or other negligent acts that contributed to the accident.

Club officers are protected in their roles as officers for claims resulting in bodily injury or property damage, but do not have any special or additional coverage under the AMA

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## What Really Happened?

by Jim Rice, District VIII Vice President and former Safety Coordinator

Safety is mostly about crashes and avoiding them or ensuring they occur in safe places. There is a lot more about safety but for this safety note, I want to talk about crashes.

When it comes to safety, it is always you first and your airplane is a long way back in second. Try your best to save the airplane and keep it in a safe area but put it in the ground, trees, or water before you endanger someone—including yourself—or someone's property.

As I have said before, there are roughly 1,000 things that can kill an airplane and I have 750 covered, but that doesn't mean that I am rolling over and letting it happen to me. Every time I crash or am present when a crash occurs, I try to do a thorough accident investigation (post mortem if you will) to find out what happened so I (we) can avoid recurrence.

I would say in my experience and observation, well more than 70% of all RC aircraft crashes are caused by the pilot, not the airplane or the radio failing. On the other hand, less than 50% of the crashes are acknowledged to be dumb thumbs (careful investigation shows that 43.2% of all statistics are made up ... LOL).

The first thing you have to do in your investigation is determine if it was you or not. You don't have to tell me or anyone else the

truth but if you want to stop the next crash, be honest with yourself about this one. You can tell me you don't know what happened when you know you pulled when you should have pushed.

I may know the truth but I am not the one who has to stop your next crash—you are! So if you are the culprit, relive the incident and determine what exactly was going on and what you did to get into trouble or to make trouble worse. Once you figure out what you did, get on a simulator and try to recreate the same scenario and do it until you survive repeatedly. If you don't have a simulator, find a friend with one or go to the field and get to a safe altitude then go higher before you try to recreate.

Now if you have been honest and it really wasn't you, then gather all of the pieces you can and see what or who the real culprit is. You will want to inspect glue joints, wires, and connectors, switches, batteries, receivers etc. If you can put it all together at the field and try it, other people will help you troubleshoot and think through it and it will be fresh on your mind. Careful, it might be too fresh (that is why I don't wear a neck strap with my radio. When I get mad I can't throw it as far ... LOL).

The last crash I helped investigate was a

result of a previous crash that had not been completely repaired. In flight, the wing suffered a failure at an old fracture that had not been noticed or repaired.

If anything was observed departing the aircraft before the crash, try to figure out what it was and locate it if you can. It may well be the cause and it would be good to inspect it to discover the reason for its failure.

Stay on the case until you know what happened or you just can't explain it. If you figure out what caused it, your number of covered items may go above my 750. If you share the information, everyone's number of covered items will improve.

Fly safely and have fun! →

## 2007 National Aeromodeling Championships

The Academy of Model Aeronautics presents the 81<sup>st</sup> National Aeromodeling Championships (Nats). This is the world's largest aeromodeling competition, in which pilots of all skill levels come together to compete against each other, and it's not all about winning! Many competitors come each year to enjoy the company of their fellow fliers and to make new friends and memories!

The Nats is a six-week-long competition that features a variety of events in which to participate. From large Scale Aerobatics aircraft to rubber-band-powered FF models, you will surely find something that sparks your interest.

Whether you want to compete or be a spectator, we are extending this invitation to all members, their friends, and their families to come out and be a part of modeling history.

Kicking off the Nats are the Indoor Free Flight events, which are scheduled for May 29-June 3, 2007, at Johnson City, Tennessee, in the East Tennessee State University Mini-Dome. This site has been used for many years and is a premier venue for Indoor events.

The outdoor events, to be held at the International Aeromodeling Center in Muncie, Indiana, start with the 2007 Pylon World Championships beginning June 23. The outdoor Nats events will follow, running June 29-August 5. For more information or a detailed schedule of events, please visit [www.modelaircraft.org/events/](http://www.modelaircraft.org/events/) or call (765) 287-1256, extensions 224, 252, or 293.

We hope to see you there! →

-Nats Staff



## Club Officer Protection continued from page 1

policy. An officers homeowner's coverage or separate club insurance policy would provide "primary" coverage while AMA coverage would be excess of that coverage.

The officers *may be* subject to claims alleging discrimination, lack of due process (i.e. member expulsion from club), or other situations where no injury occurred, and the claim is based on decisions or procedures

initiated by club officers.

The AMA policy does not insure these kinds of claims and the club may want to consider purchase of Directors and Officers Insurance from a local agent to insure this risk. Most states allow broad immunity to officers of nonprofit organizations and you may want to consult your attorney to learn more about protection in your state. →

# Suggestions for Duties of Club Officers

Club bylaws should reflect officers' duties and responsibilities.

## Section 1. President

The President shall be the executive officer of the club and shall preside at all meetings. He or she will be the spokesperson for the club. He/she shall appoint standing and special committees as he or she deems necessary. He/she will cast the deciding vote in any case where a tie vote is encountered.

## Section 2. Vice President

The Vice President shall assist the president in all matters and shall assume the duties of the president if, for any reason, the president is not able to perform his or her duties. He/she shall be responsible for the club meeting schedules and other club scheduled events which may be necessary or requested by the club officers or members.

## Section 3. Secretary Treasurer

The Secretary Treasurer shall keep accurate minutes of all regular scheduled and called club meetings and record meeting attendance. He or she will maintain an up-to-date membership record of all members including their names, mailing addresses, AMA membership numbers, and telephone numbers.

He or she will have charge of all club funds. He/she will collect dues when they are due and is authorized to pay any and all club obligations from these funds. He or she will keep appropriate records of all club monetary transactions and will provide a Treasurer's report at each scheduled club meeting.

If the Vice President, for any reason, is unable to perform his or her duties, the Secretary Treasurer will assist or take over the duties of the Vice President as needed.

## Section 4. Safety Coordinator

To promote increased safety awareness on the part of all members, improve the public perception of modeling as a safe and desirable sport, and provide a means by which important safety information can be shared between clubs, AMA chartered clubs will be required to establish the position of Safety Coordinator. This person will act as a communications liaison between the club and AMA Headquarters to ensure timely distribution of safety related material. **The Club Safety Coordinator must have E-mail access.**

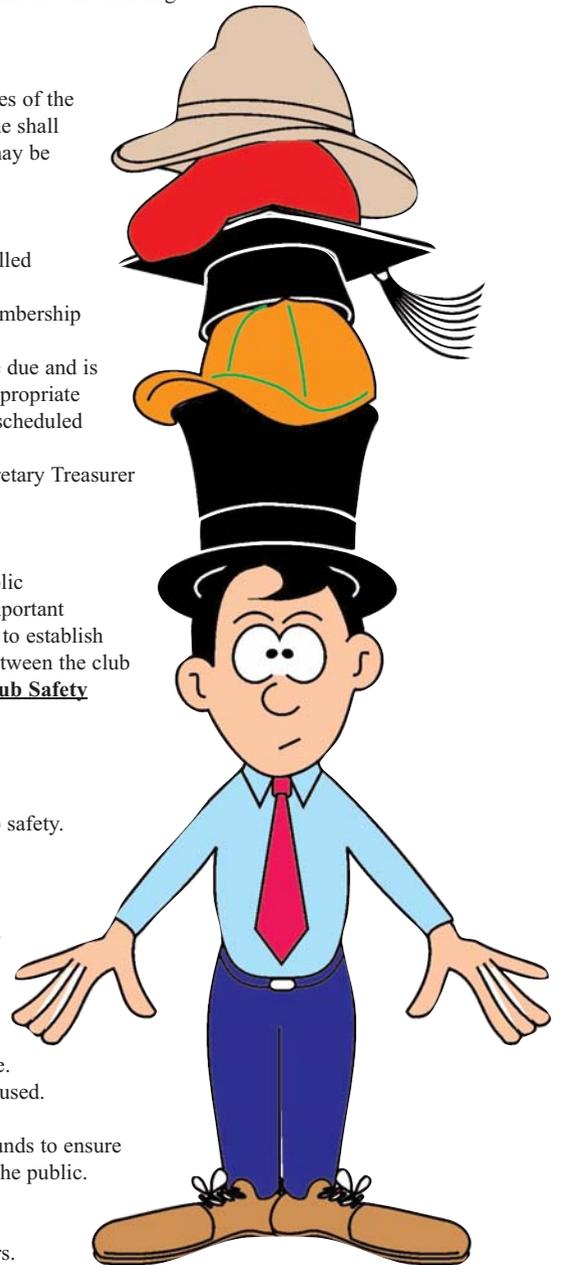
Recommended Duties:

- 1) Provide a communications link between AMA and clubs in matters related to safety.
- 2) Act as a safety advisor and resource manager for the club and its members.
- 3) Assist AMA in the establishment of a national safety program to reduce accidents/incidents.
- 4) Develop, promote, and encourage a climate of safety awareness within AMA clubs.

Safety Coordinator activities may include the following:

- Inspect operational areas for proper signage and safety equipment as applicable.
- Distribute AMA Accident/Incident Report Forms and ensure they are properly used.
- Conduct safety awareness training and related programs during club meetings.
- Conduct, at least annually, a safety audit of club facilities, equipment, and grounds to ensure everything is in good working order and safe for normal use by members and the public.
- Act as a liaison with the local EMS/Fire Department.
- Establish a club emergency action plan to handle serious accidents/incidents.
- Coordinate appropriate first-aid training for members using qualified instructors.
- Develop an appropriate communications plan to assist club officers and members.
- Review emergency procedures (fire and rescue) with club members on an annual basis.

*Note: This list is provided to illustrate the range of activities a Safety Coordinator could engage in. Authority to enforce the AMA Safety Code or any additional club safety rules should be contained in the club bylaws in accordance with your individual situation. →*



## Modes

by Jerry Gill

Modes? Are you in the mood to think about modes? What mode do you fly and why?

Chances are you are flying mode two and you're flying this mode because "everybody else is doing it." That's a good reason, especially if your instructor is a mode-two flier.

In America, mode two is predominate, mode one is flown mostly by old timers, and a couple of people fly mode three or four. When the first proportional radio sets arrived, the old timers had to make a choice. They were accustomed to buttons, single sticks with a rotary knob on the end, and levers. The levers on reed sets (four on an eight-channel, five for a 10-channel) were set up with the aileron (and rudder) on the right and elevator (and engine) on the left.

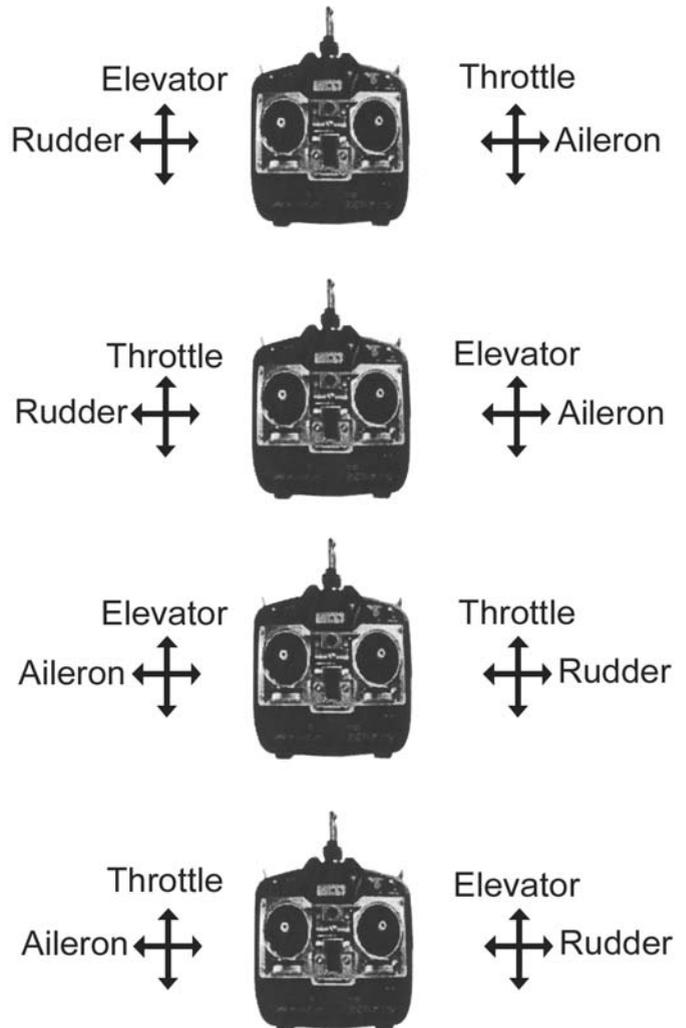
Since most flying was done with aileron and elevator, this configuration most resembled mode one and many fliers chose that route. The mode one-fliers were in the majority in the Michigan area in the 1960s and into the 1970s.

What happened after that? Mode two took over in the United States. Some early converts might have liked the single stick where the elevator cohabitated with the aileron. I have read that the radio sets that came in great numbers from Japan were mostly configured as mode two and was the largest influence. I have also heard that the ratio of mode one to mode two is much higher in Germany, Great Britain, and Australia than in the United States.

Mode-one fliers and mode-two fliers each have their own theory as to which is best. It all comes down to which works best for you.

The mode-one fliers in our area generally are the old-timers who graduated from reeds as in my case. I like and feel comfortable with mode one. I believe I can keep elevator and aileron controlled better with two different thumbs.

Some fliers can fly both interchangeably. If you can't and you're in the minority, you will find it tough to find a test pilot when you need one. Because of that and because of the availability of a good instructor are probably the best reasons to choose mode two. Some brave pilots have even changed over—successfully, too—from mode one to two. ➔



### The Transmitter, Baltimore, Maryland

## And You Want to Know Why I Like Retirement ...

Q: How many days are in a week?

A: Six Saturdays and one Sunday.

Q: When is a retiree's bedtime?

A: Three hours after he falls asleep on the sofa..

Q: How many retirees does it take to change a light bulb?

A: One—but it might take all day.

Q: What's the biggest gripe of retirees?

A: There's not enough time to get everything done.

Q: Why don't retirees mind being called seniors?

A: The term comes with a 10% discount.

Q: Among retirees what is considered formal attire?

A: Tied shoes.

Q: Why do retirees count pemries?

A: They are the only ones who have the time.

Q: What is the common term for someone who enjoys work and refuses to retire?

A: Nuts!

Q: Why are retirees so slow to clean out the basement, attic, and garage?

A: They know that as soon as they do, one of the adult kids will want to store their stuff there.

Q: What do retirees call a long lunch?

A: Normal.

Q: What is the best way to describe retirement?

A: The never ending coffee break.

Q: What is the biggest advantage of going back to school as a retiree?

A: If you cut classes, no one calls your parents.

Q: Why does a retiree often say he doesn't miss work but he misses the people he used to work with?

A: He is too polite to tell the whole truth.

Q: What do you do all week?

A: Monday through Friday, nothing and on Saturday and Sunday I rest! ➔

### 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](mailto:lhelms@modelaircraft.org)

# Do You Have an Itch to Scratch?

by Bill Bowne

Do you have an itch to scratch? Scratch build, that is. One of the greatest pleasures in modeling is creating your own design—something that no one else at the field has. I've been doing it for more than 20 years, and I still enjoy it.

Let's get one thing straight, before we go any further. When I refer to "scratch build" I mean draw up your own plans and build from them. I don't mean building from someone else's plans, because they've done all the hard thinking for you. Nor do I advocate making scratch builders grow their own balsa trees!

I believe that using stock parts and subassemblies from other models in a new model still rates as scratch building, although I can understand how others might differ. The FAA says that if you do 51% of the work in building a full-scale airplane, then it's a home-built airplane. I say it's the same for models.

Okay, how do you get started in scratch building? Actually, you can do it either of two ways. You can plunge right in, or you can work your way in. That's how I started, by working my way in. Kit-bashing, that is, starting with a kit and modifying it until no one could recognize it as a kit. Kit bashing lets you take known good components and combine them with your own ideas. As long as you don't drift too far from the original design (at least, at first), you can't go wrong.

So, let's talk about how to kit bash. The easiest way to start is by changing wing tip and tail shapes. As long as you keep the areas pretty much the same area, all will be well. Don't get paranoid! If the airplane flies well with a 50-square-inch stabilizer, it'll fly just as well with 48- or 52-square-inch one. On the other hand, making a few changes in outlines can make a big difference in the airplane's appearance.

Going further, you can make a high-winged airplane into a shoulder or low-winged one. You'll lose some stability as you go, so either increase the dihedral or add ailerons! When I converted a Little Stik into a

low winger, for example, I traced the side view of the fuselage and wing, and then moved the wing profile straight down to the bottom of the fuselage.

This is where the plans come in handy; just flip them over and trace through them. If you can't quite see through, apply a little oil and the plans will turn transparent—that's cooking oil or clean machine oil. Don't use your old, filthy lawnmower oil and complain about it being opaque! [Technical Editor's note: this is very messy and you must cover the oiled plan to keep it from getting oil on the balsa or anything else.] Keep the stabilizer the same distance back from the wing and keep the same center of gravity.

A Xerox makes replicating the wing side view much easier, *provided* the Xerox makes true copies. I've run into several that didn't. To check, compare the copy with the original. Or Xerox a ruler and compare that to the original. (As a side note, it's always a good idea to trace or Xerox the ribs and bulkheads when you build a kit, so you have templates for repairs. If you Xerox them, of course, make sure they match the originals!)

When you change the wing's position, you'll have to redo the fuselage side. One solution, popular with fully-symmetrical wings, is to just flip the fuselage over. Since the top and bottom of the wing are the same, the wing saddle matches both ways. If you can't do that, then copy as much as you can. Use the same structural methods the original designer did; just change the shapes of the parts.

The hardest part of making a model into a low-winger is usually the landing gear. If you're using foam wings, this is easy; you can even buy preshaped landing gear blocks. One of the reasons I like taildraggers is how easy it is to set them up. For a taildragger, if you don't want to diddle with plywood ribs and the complexities of mounting the landing gear in the wing, just mount it at the wing leading edge. As long as you make sure the gear sweeps back enough so that the axle is under the leading edge of the wing, you should be okay.

Part of the fun of kit bashing is that you can improve an airplane's performance as you go, for example, adding bottom rudder. When the rudder is deflected, it exerts a sideways push on the tail of the airplane. If most of the rudder is above the airplane's center of gravity (as seen from the rear), the push will add roll to the airplane's yawing motion. Please, don't confuse this with adverse yaw! One way to cure it is by mixing in aileron compensation via a computerized transmitter but if you can design it out, you don't need the fancy transmitter!

Here's a typical top rudder (as in an Ugly Stik). Notice that when the rudder is deflected to the left, the airplane rolls to the right (The red dot in the rear view is the roll axis as seen from behind). My Sylph has this pretty badly—I can turn the model on rudder and elevator alone, without any need for aileron.

But, if you move a large portion of the rudder down below the roll axis, you reduce the effect of the rudder on rolling. This is great, if you plan to do stall turns, slips, crabbing, or other maneuvers that entail rudder. Ever notice how all those Extras, CAPS, and other aerobatic full-scale models have their rudders shaped?

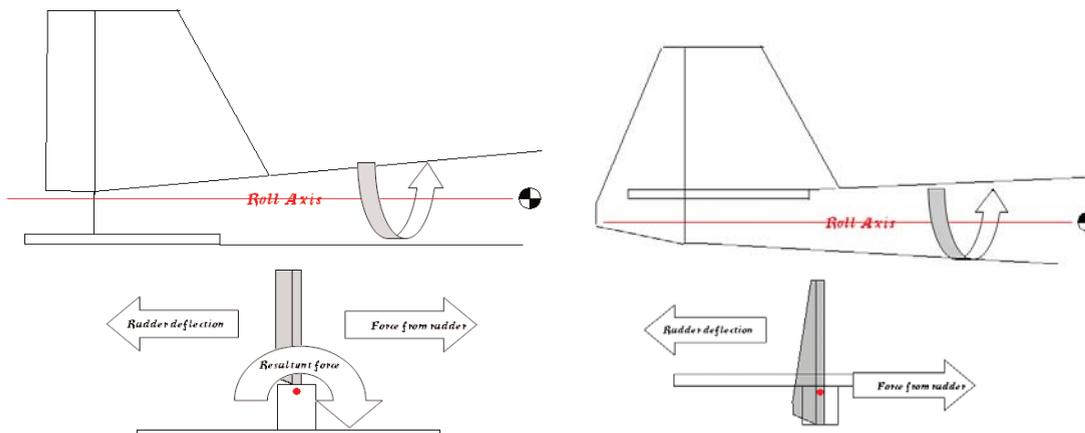
But kit bashing can go further than moving the wing up or down or changing the tail shapes. You could start with a common low-wing sport kit such as the 4-Star series, then add a turtle-deck and chin scoop. Throw in some block for a streamlined spinner, curved tail surfaces, and dummy landing gear housings, and you have a "Sorta P-40."

Remember, most of an airplane's personality is in the fuselage, so even if you use a Hershey bar wing on an Me-109, most of the personality will be there. Heck, it'll be a lot easier to fly, too! Unless you plan to compete in a Scale event, what does it matter? I'd rather have a good-looking airplane that looks well, then a great-looking one I'm too scared to fly!

Or, take two Stiks and make a "Zwilling" (twin fuselage). If you use a constant-chord wing, all you need to do is cut out more ribs. If you do a twin of something like a Kougaur,

use the root chord for a constant chord center section.

Start simple, then work your way up. At first, you'll see people staring at your model, trying to figure out what's different about it. Finally, they'll get it. As you get more into kit bashing, you'll see them take longer and longer to figure it out. Finally, they'll have to ask you those sweet words: "Okay, I give up. *What is it?*" →



# MCRCS Building Contest

by Joe Raimondo, CD

The annual MCRCS Building Contest is less than four months away. All the new airplanes that are being constructed at this time hopefully will be entered in the coming building contest. Static judging will take place on April 18, 2007, at the Lawrence Library. The fly-off will be on Opening Day, April 29, 2007.

The building rules are below. If anyone has any questions please do not hesitate to call me.

## Building Contest Rules

- 1) Contestant is allowed only one entry in each class. A contestant must be a current member in good standing. A separate category will be provided for junior members (ages 12 to 17).
- 2) Classes shall consist of scale, non-scale, old-timers, almost-ready-to-fly (ARF), and unorthodox.
- 3) The model that places first, second, or third, may not be entered in future contests.
- 4) The model, as flown, must meet all AMA and club rules.
- 5) Model must be built and finished by the member entering model.
- 6) The builder of model is not required to fly the model; a substitute pilot is acceptable.
- 7) The contest committee and/or Contest Director will select judges.
- 8) The judges may not have an entry in the class that they are judging.
- 9) Judging will be held on a regular meeting night as specified by the Contest Director.
- 10) Model airworthiness will be judged at a later date as specified by the Contest Director.
- 11) Weather conditions for flying will be determined on the field at 9 a.m., on the day of flying. If weather conditions are unfavorable, flying will take place two weekends later, between the hours of 9 a.m. and 2 p.m.
- 12) Flying must be conducted between 9 a.m. and 2 p.m. with no exceptions; builder of model need not be present.
- 13) Models presented for static judging must be demonstrated to be operational at the static judging.
- 14) The flying portion will consist of a takeoff, a 360-degree turn, and a controlled landing as a minimum (hand or bungee launching is acceptable).
- 15) If a score of zero is received for the flying portion, the model will be disqualified.
- 16) An award will be given to each member entering a model. The top three (3) scores in each category will be recognized as first, second, and third.

*Ed. Note: This might be a fun idea for a club contest! With time probably too short now to organize a contest such as Joe has outlined, consider modifying it and giving your club something to do during the colder months! →*

## Tips & Tricks

### RAPIDRY

Maybe it is just me, but every time I buy cyanoacrylate “kicker” the spray nozzle becomes a “stream” nozzle after a few uses. That mystical smelling stuff has a habit of evaporating right through the bottle too. I have found an easy solution to this problem.

My wife uses a fingernail polish dryer called RAPIDRY. This is in a 2 oz spray bottle. The pump and composition of the bottle work great with kicker. I wouldn't be surprised if the stuff in the bottle works as a kicker too. All I get are the empties.

—Russ Whitford

The Slopeflyers Web site,  
[/www.slopeflyer.com](http://www.slopeflyer.com)

### Routing Servo Wires

A method for fishing servo wires through wings, especially ribbed wings, is to go to the hardware store and get about three feet of the smallest beaded chain you can find. You know, the stuff like on the pull chain of your ceiling fan, only smaller. Drop this chain in your servo bay, and rock the wing back and forth. The chain will find its way down like water. Tie a string or your wire to it, and pull it right through.

—Richardson Radio Control Club,  
[www.rrec.org/](http://www.rrec.org/)

### Removing Epoxy

To remove epoxy from yourself safely, use white vinegar. It's smelly, safe, and very cheap!

—Prop Spinner Chatter Eugene OR

# Flight Trimming

Submitted by Jack DeLisle

## Proper Center of Gravity (CG): Method A

Roll model inverted.

- A. Slight down elevator required for level flight—no adjustments.
- B. Significant down-elevator required to sustain level flight—move battery pack backward.
- C. No down-elevator required to sustain level flight—move battery pack forward.

## Proper CG: Method B

From level flight, roll model to a knife-edge.

- A. Model falls without dropping nose or tail—no adjustments.
- B. Nose drops—move battery pack backward.
- C. Tail drops—move battery pack forward.

## Engine thrust up/down

From level flight out around 100 yards, pull to a vertical climb directly in front of you, release sticks and observe deviations.

- A. Model continues straight up—no adjustments.
- B. Model pitches toward wheels—decrease down thrust.
- C. Model pitches toward canopy—increase right thrust.

## Engine thrust- left/right

Fly model straight and level into the wind and pull vertical.

- A. Model continues straight up—no adjustments.
- B. Model veers left—increase right thrust.
- C. Model veers right—decrease right thrust.

## Knife-edge flight—pitch

Fly model into wind, maintaining knife-edge flight with minimal rudder. Do this from each direction.

- A. Model continues on knife edge without deviation—no adjustments.
- B. Model pitches toward landing gear—mix in up-elevator with rudder.
- C. Model pitches toward canopy—mix in down elevator with rudder.

## Knife edge flight—roll

Fly model into wind. Do this from each direction, maintaining knife-edge flight with minimal rudder.

- A. Model continues on knife edge without deviation—no adjustments.
- B. Model tries to roll—mix in opposite aileron with rudder.

## Aileron differential

Fly model level heading into the wind or downwind. Pull to a 45-degree climb, and roll with aileron.

- A. Model rolls without yaw—no adjustments.
- B. Model exits yawed in opposite direction of roll—increase differential. Increase up throw on aileron.
- C. Model exits yawed in direction of roll—decrease differential. Decrease up throw on aileron. →

# Repair 101

by Ed Olszewski

With the days getting shorter, it is the time to get started on repairing those airplanes that did not quite make it through the year intact. I know they may look like a disaster and appear unrepairable, but take a few minutes and look at it a different way. The craft is not half destroyed, it is half built.

I would bet there is probably a good set of tail feathers. And while part of the wing may be smashed, at least half of the wing is still in good condition. If you were building that airplane, you would consider it half complete, wouldn't you? It is often surprising what you thought was an unrepairable craft, will take less time to repair than assembling a new ARF.

There are a few basic repair principals to remember. First and foremost, it is never as bad as you first thought or it looks. Second, aside from the pilot, everything else is structural, or it would not be there, even the covering adds to the structure. Third, take your time and do a good light repair; a pound of glue has no structure, it just adds weight. Now get started.

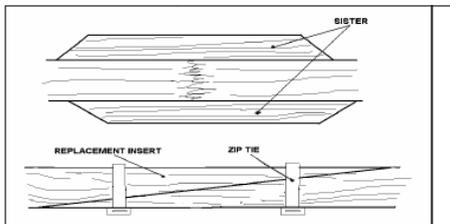
Assess all the damage. Remove enough covering to fully see, and be able to work on the damage. This is no time to be shy. Often a fracture is hiding under the covering just beyond your sight. Remember, it does not take any more effort to apply a large patch of covering than a small. Also, since the covering is a structural element of the craft, a larger piece of covering will probably be more sound anyways, and it will always look better than a small patch.

Get to the bottom of the damage. You may have to remove some planking or ribs to reach a broken area. But remember, all the elements of the craft are in some way structural, that is why it is important to repair every damaged part.

Don't try to kid yourself; new glue will not stick to old glue, grease, oil, or oil-soaked balsa or ply. Remove all oil soaked wood at the beginning, new wood is cheap and well worth avoiding the aggravation of a poor glue joint.

Scrape off all the old glue while you are in the disassembly stage of the project. A little effort here will make the rest of the job go more smoothly.

Sticks of wood do not bond well end to end; wood needs a lot of gluing surface. Butt joints will always fail, and always in the air. Always "sister" joints or use a "lap" joint. Use glue sparingly with clamps until the glue dries. Zip ties make very good clamps for holding joints together while drying, you can even leave them on permanently, if space allows.



Think of planking the same way as a spar, and avoid butt joints. Cut the patch of planking material with a "zig-zag" at the end of the patch. Then use the patch to cut the repair hole through the planking. If there is no room to zig-zag the end of the patch, add a sister under the end

of the hole to glue the bottom of the patch to.

Do not try to simply fill in cracks with glue. Take the time to make tight fitting joints. We are trying to make a sound repair on an aircraft, not calk a submarine. Filling a crack with glue will not hold near as well as a good tight glue joint. The results will be heavy and eventually fail.

Repairing an airplane can be very rewarding. Often it

helps ease the "flying jitters" after you find how easy it is to repair all but the worst crash. Now pull that jigsaw puzzle of an airplane out of the two garbage bags you have been storing it in, and get to work! →

# How to Call

by Rich Fletcher

Being a good IMAC (International Miniature Aerobatic Club) caller is a subject that is not typically high on our list of conversational topics, either at the field or in the shop. But having a good caller can make the difference between winning and losing. This is especially true when flying an Unknown sequence. Having a good caller can make all the difference in not missing any maneuvers in the sequence or flying them incorrectly which is critically important.

I break down the types of callers into three categories. The first is the simplest: calling out the maneuvers in sequence. The second is more interactive and will call the maneuvers as well as provide the pilot with some guidance. The third type will verbally fly the sequence with the pilot and really acts more like a navigator than a caller. The type of caller each pilot needs is determined by his or her personal choice. Some pilots like much verbal help and others do not.

All three types should help the pilot relax at the flightline by assisting with the handling of score sheets, holding the airplane during engine start, retrieving the airplane after landing, and calling out the maneuvers to the judges if asked. The caller will also act as a "safety officer," constantly watching for another airplane flying too close and possibly calling "avoidance."

This safety function is of considerable importance and cannot be actively performed if the caller is acting as the third type of caller previously mentioned. The caller should be concerned for the overall safety of the flight, judges, and pay attention to all the airplanes on the ground and in the air because the pilot has little if any time for this while concentrating on flying the aircraft through the sequence.

There is not much to discuss about the first type of caller. I am a pilot who likes this type. I usually will tell my caller to place his or her thumb over the second maneuver on the call sheet and as they call out the maneuver to work their way down the list. What is important for this type of caller is to simply call out the maneuvers loudly and clearly, in sequence, and be ready to repeat a maneuver if asked.

The second type caller will give the pilot further assistance such as counting down as the airplane approaches the end and center of the box, for example, "one one thousand, two one thousand, three one thousand, center!" He or she will also give some general advice such as "you are out too far, bring it in a bit." He or she may also help if the pilot is struggling in an area, such as getting blown in or out of the box during a crosswind.

The third type will do all of the above and work in total unison with the pilot and assist with all aspects of the flight. Advice will include working on trimming the plane during the trim pass, setting up the entry into the box, giving rudder corrections and other control inputs, help with flying the correct geometry of maneuvers, help with proper entries and exits of each maneuver, and anything else the pilot needs to fly the sequence. I often will assist new competitors with type-three calling and many of them find it helpful.

More experienced pilots usually prefer less interaction with their callers. A disadvantage seen in constantly relying too much on a type-three caller is that certain people become "favored" callers by a number of competitors during a particular event. This can have a distinct disadvantage in that one may hold up the flightline waiting

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for that favorite caller who is currently helping someone else.

One should always have as a goal to strive to know the sequence well enough to be able to compete with only the first type of caller. Never rely on any singular person to be a favored caller in case of their unavailability. Additionally, relying too much on another person over time prevents one from acquiring and building those necessary skills to succeed in precision aerobatics and move up the ladder in flying skill.

At the extreme, when one becomes more of a coach rather than a caller at a contest,

who is really competing? The pilot who is blindly following instructions on control input or the caller? Having noted that, the type-three caller is quite valuable for the new competitors, especially in the Basic class, because it gives a new pilot the chance to benefit from those with more skill and competitive backgrounds.

If you are new to IMAC and competing in your first events, seek out people in the upper classes and have them help you on the flightline when you fly your sequences. Always take advantage of those with expertise and who are known to be

competent callers. Ideally, the people you practice with or who coach you make the best callers at a contest because they know your flying skills and needs better than anyone else.

Having a good caller is extremely valuable to your success at winning contests and it is a valuable skill to acquire. Conversely, having a bad caller can be a nightmare and can easily cost you a good score on a flight. It is all too easy for the caller to give you incorrect information and ruin a maneuver. Work on your calling skills and it should pay dividends at contests. →

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