

# Ramblings

Official Newsletter of the Roxbury Area Model Airplane Club



Volume XXXIII, Number 370

September - October 2009

AMA Charter #429

## RAMAC ANNUAL MEETING NOTICE

**O**UR ANNUAL MEETING IS DECEMBER 8th AT THE EISENHOWER SCHOOL. If you are going to make only one meeting this year this is the meeting to attend. Officers are elected at this meeting and **POSSIBLY OTHER IMPORTANT CLUB DECISIONS FOR 2010!** There are no new nominations to date. If you would like to run for an officer position or would like to nominate someone please contact a board member. **THIS IS YOUR NOTICE TO ATTEND!**

-RAMAC BOARD

## Club Auction November 10th

**I**THIS YEAR I'M GOING TO TRY SOMETHING NEW W/ THE AUCTION. We are going to bring all of the stuff in and set it all up on the tables but, for the first hour we will just sell items to attendees like at a flea market. For the last two hours anyone that brought items to sell but didn't sell them in the flea market hour MAY put them on the auction block to try and sell them that way. They still will have the right to last bid, as always. This way the attendees will already have an idea of what the seller is looking for and the seller will have an idea of how outrageous his asking price is! I think this will make for more enthusiastic bidding and I can save my voice by not having to auction every item in the room.

The club will still get 10% of all sales whether sold on the tables or at auction. The auction rules will still be the same and everybody can go home happy. The auction will be in the Eisenhower Middle School cafeteria on the 10th of November. People can start setting up at 6:30 PM and start selling at 7pm. The auction will commence at 8pm and we have to be out of there by 10pm.

There is no entry fee for those who just come to look or buy. All Sales are final. RAMAC makes no claims as to the condition of

Carl was noticeably nervous during the hand-launch endurance event.



any items sold, since we aren't the owners of the items. Item sellers are responsible for paying Ramac the 10% sales fee whether the items sell off the flea market tables or at auction. No credit cards or checks please. Only Radio Control related items and if you bring the items to sell at this event please don't sell them in the parking lot. Come on out to the auction and maybe go home with some treasure!

-LEW "WOLFMAN MCCARTHY

## Important information 2.4GHz receiver batteries

**I**t is quite likely 2.4 GHz radio systems will go down in history as one the greatest advances in our sport. We have all seen an aircraft in flight go all wacky and someone yell, "Did someone turn on a radio"? On the rare occasion, the offending radio is quickly turned off leaving the pilot's heart pounding, knees shaking,

and pants weighing a bit heavy in the rear. However this is the exception. Usually the plane ends up getting shot down followed by a very uncomfortable "conversation". Hopefully the "gunner" follows the unwritten rule (and it's just the right thing to do) of replacing the aircraft. How wonderful it is an affordable technology exists that eliminates this far to common problem.

Boy do I want one of these! I have passed up buying a new 2.4 GHz radio a few times to buy airplanes instead, but the plunge needs to be taken. I plan on asking Santa to bring me a new radio for Christmas. I have been extra good this year, haven't I. While reading up on the new 2.4 GHz radios I have come across some discussion on battery voltage for the receiver. The discussion is whether 4.8V or 6.0V batteries should be used for the receiver. Like most everything in our hobby, there is strong opinion each way. Indeed there are even some radio manufacturers selling their radio systems with 4.8V batteries for their 2.4 GHz receivers. Below is an article from AMA technical editor Ed McCollough on the topic. As always the decision is your own, I hope the following article prompts some thought.

-DAN VANNIEUWLAND

<u>DATE</u>	<u>DAY</u>	<u>EVENT</u>
All Year		The Great American Crepe Paper Tow Contest CD, Bob Karasiewicz
Oct. 13th	Tuesday	Club Meeting Eisenhower School, Roxbury
Oct. 27th	Tuesday	Club Meeting and Indoor Fly Eisenhower School, Roxbury
Nov. 10th	Tuesday	Club Meeting and AUCTION Eisenhower School, Roxbury
Nov. 24th	Tuesday	Club Meeting Eisenhower School, Roxbury
Dec. 5th	Saturday	Holiday Party at LaStrada's in Roxbury 7:00 Bob Clark CD
<b>Dec. 8th</b>	<b>Tuesday</b>	<b>Club Meeting and <u>ELECTIONS</u></b> Eisenhower School, Roxbury

**KEEP THE 2009 CALENDER UPDATED. CONTACT DAN VANNIEUWLAND**

A short time ago, a modeler wrote Ed McCollough (your humble technical editor) the following:

"Noticed and noted on the foot of page 66 of March Model Aviation underneath the picture of the Spektrum/JR flight logger, it is recommended that six-volt battery packs be used on ALL 2.4GHz receivers. Called Horizon Hobby on the phone; they confirmed this statement. It was suggested the same six volt usage for other brands also. Would like to suggest the general membership be made aware of this when 2.4 GHz receivers are used in glow/gas airplanes/helis to preclude possible in-flight loss."

When I read this, I agreed with him and wrote him I would get on the problem. Please, read what he wrote and consider it very, very carefully. Unfortunately, the answer to his question hasn't been that quick or easy, but for the time being, here it is:

If you are flying a 2.4 GHz system, follow the manufacturers' specifications for the voltage. If you are using a separate voltage pack for the receiver, be absolutely sure it has enough voltage to run the receiver. A common 5.0-volt receiver

pack may not have sufficient voltage to run your particular receiver. Actually, if you used a six-volt pack and it was adequately charged, it should be sufficient, regardless of the manufacturer.

There is one problem, when using a six-volt pack if it isn't required by the manufacturer of your system. That problem will likely happen if you are using digital servos. If you drive some digital servos with six volts, there is a high probability you will damage the servos because of the higher voltage. Remember, if the servos fail, it won't make much difference that your receiver is still working.

You always need to be flying with a functional receiver pack, one that is as close to fully charged as possible. Remember, insufficient volts to the receiver and you crash.

Lastly, as in all things, and in all cases, read the instructions.

-ED MCCOLLOUGH,  
AMA INSIDER TECHNICAL EDITOR

## Better Performance With Less Noise

With the ongoing debate about the noise our little engines produce, much is being done to preserve our way of life while respecting the rights of others. At first, noise reduction sounds bad for pilots. We think that reduced noise means reduced power, and conventional wisdom supports this. It is not until you fully understand how engines and propellers operate that you will realize the gains that benefit not only our neighbors but our airplanes as well!

There are four contributors to the noise made by models (in no specific order): muffler type, engine speed (rpm), tip speed of the propeller, and vibration.

### Muffler

The mufflers provided with today's engines are quite good for the rpm range in which they are designed to run. Mufflers that come with internal baffles should keep the baffles in. Removing them does nothing to boost power, it increases noise, and makes the engine idle poorly because of lack of back pressure. Pitts-style mufflers shouldn't have more exit area than the stock muffler does, and if it does, one of the ports may have to be partially or completely blocked. Again, this will help idle.

### Engine speed

A large contributor of noise made by airplanes is an over-revving engine. Most modelers try to make their engines run as fast as possible, trying to obtain the rpm at which the manufacturer claims the largest brake-horsepower (BHP) number. What they don't realize is the peak efficiency for the engine occurs at peak torque, which is usually about 65%-75% of the peak BHP rpm.

Example 1: A manufacturer of a .46 engine claims 1.5 BHP at 16,000 rpm. After break-in you find that you can turn a 10 x 5 propeller at 15,500 rpm—very close to the peak BHP, but the airplane's performance is mediocre, it is loud, and consumes way too much fuel.

Now you find the engine's peak torque is about 70% of the peak BHP rpm (.70 x 16,000

**RAMAC Annual**

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**Lew "Wolfman"**

**McCarthy for Details**

rpm = 11,200 rpm). You switch to an 11 x 7 propeller and find that the rpm is 11,500. You are much closer to peak torque now, and the airplane flies better and is quieter because the frequency of the engine firing has reduced dramatically. The fuel also lasts longer, and the engine will last longer as well since it is not working as hard. A slower engine also helps in achieving the next goal ...

### Propeller Tip Speed

The tip speed of the propeller is critical in quieting the airplane. The point where things get noisy is 560-feet per second or about 380 mph. Going more than 400 mph is a big no-no. Even in an airplane that is built for speed, you should be able to choose a quiet propeller.

Example 2: Same setup as the last example, the 10 x 5 propeller is at 15,500 rpm and the 11 x 7 propeller is at 11,500 rpm. The formula for tip speed in miles per hour is: (Diameter in inches)(3.1416)(rpm)/1056. The number 1056 is a constant that converts inches per minute to miles per hour. A 10 x 5 has a tip-speed of 461 mph (a no-no).  $(10)(3.1416)(15500)/1056 = 461$ .

We want our tip speeds no faster than 400 mph and it should be less than 380 mph if you want to keep your flying site. The 11 x 7 at 11,500 rpm has a tip-speed of 376 mph.  $(11)(3.1416)(11500)/1056 = 376$ . The tip speed is now down to a moderate level. But how do these propellers compare in performance? You can calculate airspeed by using the propeller pitch and the rpm of the propeller. The pitch of a propeller is the second number in the propeller designation. This is the distance in inches that the propeller will travel through the air in one revolution.

Multiplying the pitch by the rpm and dividing by 1056 will give the calculated speed of the model.  $5 \times 15,500/1056 = 73$  mph;  $7 \times 11,500/1056 = 76$  mph.

So your airplane will actually be traveling slightly faster with the 11 x 7 than with the 10 x 5, while turning 4,000 rpm slower. This reduces engine noise, propeller noise, fuel consumption, wear and tear on the engine, etc., without compromising performance.

### Propeller Loading Factor (PLF)

How do you know what to expect switching propellers? Being able to compare propellers before you run them is the key to optimizing your airplane's performance and getting rid of the noise. Say you are happy with the rpm that your engine is turning with the 11 x 7 propeller, but you want to try other propellers to see what you like best for flight performance.

Right now you are at the middle of the road, slightly fast and passable vertical performance, but what if you want more vertical? First we solve the PLF of our existing propeller, and then we compare it to others.  $PLF = D \times D \times P$  (D=diameter, P=pitch)

The 11 x 7s PLF would be  $11 \times 11 \times 7 = 847$  PFL (compared with the 10 x 5s or 10 x 10 x 5=500 PLF). Now let's see what else is out there. To increase vertical you should either increase diameter, decrease pitch, or both.

To keep a PLF close to the same you will have to do both. If you are trying to raise the rpm, decrease pitch—and if you are trying to slow the motor, increase diameter. I would try the 12 x 6 first and then the 13 x 5. They have close PLFs. This is for comparison only. Switching propeller brands or not balancing a propeller, among other things, can vary your results.

### Vibration

How does the vibration of your model relate to the sound it makes in the air? Well, sound is vibration. Imagine your beautiful model—a nice wooden structure covered in drum-tight plastic covering. Think of it as a percussion instrument. The piston is traveling up and down like a drumstick pounding away at your model. And your model echoes every stroke it makes. The same thing happens with an out-of-balance propeller. Noise. It's everywhere! Your new mission: get rid of all vibration.

### Start at the Propeller

It moves 300+ mph at the tip—balance it! It will remove noise because all that vibration won't exist in your airframe. Our neighbors will thank you and your receiver crystal, your servo pots, fuel tank, and NiCds will thank you as well. You will be rewarded with much greater reliability and a longer airframe life span. Also consider a high-quality spinner. They are better balanced and look nicer.

Back to the other cause of vibration—the engine. It is not possible to balance an engine dynamically at all speeds, so some vibration will forever be present, especially with four-strokes. The only thing that you can do about it is to isolate the vibration from the aircraft, making less noise in the process. Iso-mounts vary in type and price; from rubber grommets between the firewall and the mount, to specialized mounts for specific engines and airplanes that cost \$100 or more. A popular one is made by Dubro and is for any 40-90-size 2c or 4c engine. It sells for \$20-\$30. Well worth the investment!

While it may not be feasible to make every one of these criteria work on your aircraft, it is important to keep these points in mind when getting your airplane ready to fly. If we all do a little, we can make a big difference. Remember, a 3 dBA difference in sound and the intensity doubles. If you can make your airplane even 3 dBA quieter, you have made a huge cut in the noise that everyone around us has to hear. (Although the sound energy is halved for every 3 dBA drop, it takes a 10 dBA drop for the human ear to perceive the sound being half as loud. A 10 dBA drop results in one-tenth the original sound energy.)

-BRIAN DORFF

FROM THE ANOKA COUNTY RADIO CONTROL CLUB, COON RAPIDS, MINNESOTA

## Pre-flight Checks

### You can't hit a reset button

**D**o you do a pre-flight check? You know, check out the controls before you fly or even before you start! It's a good idea.

Put your airplane together, check all the controls to see if they work, *then check them again to see if they are going in the correct direction*, and lastly do a range check. This is what I try to teach my student pilots to make it a habit so they will always do it.

When I start the engine and go to the flight line I like to do a last check. Are the control surfaces going in the correct direction? It's not that I expect them to change—it's just a double check.

Once, long ago, I was setting up a new Quickly 500 and someone interrupted me with a question. I took the time to answer and then started my new airplane, went to the flight line, and took off. The plane banked a little to the right so I gave a little left aileron. It banked a lot to the right, and I gave it a lot of left aileron, at which point it hit the ground inverted.

You guessed it! Reversed ailerons. During my "check-out" I never got to the ailerons; when I went to fly, I assumed they were correct.

Two causes of that crash: One, I didn't check the ailerons, and two I didn't double check the ailerons. I could also put down that it was the excitement of a new airplane, but if I did the checks I would have found the reversed ailerons.

Now we're in 2003 and I'm preparing my new Jackson Pollock *Duelist*. The airplane got assembled and on checking the ailerons, one didn't work. Replaced the extension and then it worked. I did a ground range check, then started the engines. Mike Ramsey is ready for pictures. Taxi out and bring the engines up slowly to speed. Man, were they sweet sounding! Take-off! Roll slightly to the right, no problem, add left aileron correction. Hum, more roll. Rolling faster now. Oh no! Reversed aileron again!

I was once told by a full scale commercial pilot that when he does his walk around before the flight and he is interrupted by anything, he starts the walk around over from the beginning. Now why didn't I think of that.

Now I did, and it will *not* happen again, ever. Any interruption and I vow to start over, check and double check everything.

By the way, the *Duelist* is repaired and is flying, and Man is sweet sounding.

-ROBERT KARASIEWICZ

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