

Issue
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BIMONTHLY NEWSLETTER FOR CLUB
OFFICERS AND LEADER MEMBERS

AMA INSIDER



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The Academy of Model Aeronautics is a world-class association of modelers organized for the purpose of promotion, development, education, advancement, and safeguarding of modeling activities.

The Academy provides leadership, organization, competition, communication, protection, representation, recognition, education, and scientific/technical development to modelers.

AMA Vision

We, the members of the Academy of Model Aeronautics, are the pathway to the future of modeling 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.
- A safe, secure, enjoyable modeling environment.

President to President

A PROMISING NEW YEAR

Bob Brown, AMA President, bobb@modelaircraft.org

As we swing into the New Year, I'd like to welcome two members to the AMA Executive Council. Randy Cameron will now represent District VI and Mark Johnston will represent District VIII. Also elected were Eric Williams, District II; Mark Radcliff, District III; Bliss Teague, District IV; and Lawrence Tougas in District X. These gentlemen will certainly provide the expertise to guide the Academy. The New Year looks quite promising with the innovative thoughts these gentlemen can generate.

The AMA Expo will take place in the Ontario Convention Center, Ontario, California on January 11-13, 2013. Speakers include author Gary Fogel discussing his new book; Jerry Budd for NASA's Dryden Flight Research Center; Chris Anderson will discuss non-commercial UAVs currently being operated under FAA's recreational unmanned aircraft guidelines; and Nick Maxwell will demonstrate his unbelievable helicopter flying skills.

A static display competition will allow attendees to see some of the best models in the US. Vendors will be displaying and selling new products and if you can't find something from them, perhaps you will in the swap shop.

Additional information can be found at <http://amaexpo.com>. Tickets may also be obtained on

that site. The AMA Executive Council meeting will be held in conjunction with the show on January 14, 2012. See you there!

Quite often members ask for suggestions on how to improve their club contests or fun-flies. Experience illustrates that planning ahead should be one of the primary goals. All too often an event is generated in a very short period of time. More often than not, the event is unsuccessful.

If you are going to host an event, why not start now? The organizer should evaluate the needs, apply for a sanction, and generate advertising as soon as possible. Doing this at least six months ahead of time certainly generates an atmosphere of success.

Another key to success is to patronize other activities hosted by other clubs. Camaraderie between modelers and clubs certainly leads to increased enjoyment for model aviation.

Recently, the Mentor Area Radio Control Society held its Holiday Electric Fly. More than 250 participants enjoyed the club's great hospitality. A portion of the unbelievable site provided the venue for the first sanctioned FAI F3P held in the US. Hopefully the interest exhibited will allow this class to be recognized by the Academy. It appears that the AMA and NSCRA are working toward this goal. →

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TOLERANCE, NOT APPROVAL

Jim Tiller, jtiller@hotmail.com

I happened on an interview on *CBS This Morning* with the controversial pastor Rick Warren. I am not here to discuss his teachings, but I think I did find a safety issue in the course of the discussion. Let me see if you agree.

In the course of that interview I found some very telling remarks. When Nora O'Donnell asked a question, Rick Warren answered:

WARREN: Well first, let me ask you. Do you consider yourself to be a tolerant person?

O'DONNELL: I do, yes.

WARREN: So you would be respectful of people who would disagree with you, no matter what?

O'DONNELL: Agreed.

Further on, Mr. Warren expanded on his idea of tolerance:

"The problem is that tolerant has changed its meaning. Tolerant used to mean I may disagree with you completely, but I'm going to treat you with respect. That's what tolerant means. Today, to some people, tolerant means you must approve of everything I do. That's not tolerance, that's approval. There's a difference between acceptance and approval."

Quite often I am passed links or emails showing funny or interesting antics with RC airplanes. Some are very interesting and informative. They show the flying qualities of a particular model or educate the viewer on some aspect of flying. I am not talking about those kinds of postings.

The ones I am speaking of are the ones of a more sensational nature. I am not quite sure what the motivation is for many of those who post these pictures and videos. I guess I do not share the need for that kind of attention or the urge to see my posting go viral.

Also, I think there must be a need to try to outdo what the last guy did. But, for whatever the reason, YouTube and the other Internet sites seem to be full of these kinds of wild-and-crazy videos involving RC airplanes. Some are pretty cool. Some are interesting. And there are a lot of

others.

Like Ms. O'Donnell, I consider myself a tolerant person. I try to be respectful of those with whom I disagree. When I view these types of videos and posts of over-the-top behaviour using RC airplanes, I must say I disagree with what they are doing, but I am mindful that they have the right to their own opinions and actions.

I am not sure why anyone would want to strap a shotgun to a helicopter or shoot at RC airplanes with a high calibre rifle, but I am not in charge of their actions. I have certainly done some things that, in hindsight, might be viewed as just as irresponsible.

But, as in the words of Mr. Warren, tolerance does not mean approval. When you say you have the right to do those things, I have to respect that, but I do not have to approve. I do think your actions are foolish and irresponsible. Here's why.

Your actions, that I tolerate because I am a rational man, have widespread effects. By your own admission, it is your hope that your videos will be seen by thousands of people. Yes, they are seen by huge numbers of people. Some are modelers, but many more are not. Many are people that I run into in my life.

When I go to the local landowner or government agency to ask if I might have access to property to enjoy my hobby, is the answer influenced by your video?

At the mall show, when I try to encourage the parents to involve their children in RC flying, have they been witnesses to any of your reckless behaviour?

When I discuss my hobby with those who do not understand it, do I have to try to rationalize your foolish flight around the Statue of Liberty?

You see, your actions often spill over into my life. So my request is this: There is little value in telling you not to do these things. As I have been saying, that is your right. But what I would ask you to do is to think about it a little.

Instead of rushing to the computer to get that video onto the Internet as soon as possible, let it sit for a day and see if it still looks quite so cool. Like words said in anger, once they are out there, you can't

take them back. Maybe 24 hours from now, it won't look quite as funny or cool. Maybe it will look foolish, or worse yet, dangerous and irresponsible. Irresponsible enough that it might affect my life and many others.

That is the safety issue.

A Winter Shop Warning

If you live in the 'northern tier' as I do, you are probably huddling in and trying to stay warm in the workshop. But for some of us, that workshop time is just as rewarding as the missed flying time caused by inclement weather.

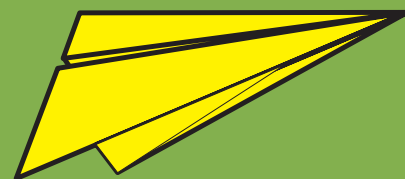
We deal with a lot of aerosol substances that can not only make the family want you to leave the house, but also have an adverse effect on your health. One of my flying buddies is a doctor and his mantra is that if you can smell it, you should be wearing a mask. Many of you do that, but in the winter, it is much more of a problem.

In a closed shop you should be extra mindful of fumes.

Make sure your shop has some sort of ventilation. It may not be possible to open the door much in the winter, so some sort of exhaust fan is a necessity. Make sure your shop is properly ventilated. →

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HIGHLIGHTS FROM CLUB CORNER

Jim Wallen, Club Corner author, sjwallen@tde.com

We are starting a new year and perhaps it is time to do a “reset” to some old habits and start out fresh in 2013. Perhaps we have read of new ideas but never really followed up on them. It was just too easy to sit them in the corner of our mind to gather dust. Let me dust off a few of them we have previously talked about in the last few years.

1. Make it a point to attend more club meetings. New ideas pop up and you may meet some new friends.
2. Get out to the flying field a little more often. You may also want to volunteer to join a work group to

- keep the place in tip-top shape.
3. Be more active in your club flight training program. If you do not have one, you may want to be proactive in getting one started.
4. Club social events strengthen the bond between club members and their spouses.
5. Get down to your local hobby shop; introduce yourself and your club. Invite the owners to a club meeting or do some buddy boxing if they have not flown before. Remember, it is the hobby shops best interest to see your club thrive.
6. Make your club known to local

officials. It can pay dividends down the road.

7. Be visible to the public. Put on a simple mall show. Put a float together and march in a local parade. Hand out flyers, maps, and candy for the kids. Smiles, warm handshakes, and model airplanes are a great mix for public relations.

Remember, this article is just a dusting off, not a total housecleaning job. Pick a task or two that you feel comfortable with and go make it happen. It's fun to be proactive and see something positive happen because of your input. →

Leader to Leader

BECOMING A LEADER MEMBER

Rusty Kennedy, Chairman Leader Member Program, rustylm@verizon.net

2012 is coming to a close and AMA has had a good year. Membership is up for the first time in nine years. Let's help keep this trend going.

I am often asked, “What do I get if I become a Leader Member?” Volunteering to become a Leader Member in today's AMA takes careful consideration. Leader Members are asked to give their time and talent. What Leader Member do receive is the satisfaction of knowing that they

assist AMA because they want to and they understand the importance of helping members and clubs at the local level. I personally find it very satisfying to know that I, and other Leader Members, work solely to help AMA meet its mission and vision.

Being an active Leader Member is becoming a valuable resource within AMA and the AMA senior leadership recognizes this. The Leader Member Program 2013

goal is “One Club, One Leader Member.” AMA needs actively participating Leader Members, who are willing to work at the local level assisting their clubs in using AMA programs and increasing membership.

Feel free to contact me directly at rustylm@verizon.net with any questions you may have.

Have a prosperous and Happy New Year. →



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A123/LiFe MONITORING

Jack Sallade (j.sallade@comcast.net)

I have been using A123 battery packs to run my onboard electronics in my fuel-powered RC aircraft for a couple years now. A123 Systems makes, in my opinion, the best LiFe chemistry batteries on the market and LiFes in general are almost ideal for use in our larger, fuel-power aircraft. As a result I have gotten somewhat complacent when it comes to onboard batteries as they have proven to be extremely reliable.

My two largest planes (both 50cc class—a Mustang and a Slick 540) each carry two 2300 mAh two-cell packs that power everything onboard from receiver to servos and ignition. I typically charge them after each flying session, but rarely even check them when I get to the field if I've charged since the last trip. I can do this because LiFes have the characteristic of very low drain while being stored—on the order of 2-3% a month. That means after a year on the shelf at room temperature, two thirds of the capacity is still available!

One of the great things about LiFe batteries is that they have a flat discharge curve. That means that, throughout a vast majority of the time, they are in use from a few minutes after they are taken off charge until they are very nearly drained, they put out the same voltage. That range is between 6.5 and 6 volts over roughly 90% of their available capacity. That means our onboard electronics see a constant voltage during every flight.

LiFes also are capable of massive current delivery—on the order of 15C (15 times the 1 hour discharge rate of the pack) with little sag in voltage, so short bouts of high-load maneuvering don't cause an issue either. Even then, voltage seems to stay above 5 volts so all onboard systems continue to run flawlessly.

A few other folks have adopted LiFe use in their airplanes and one of them approached me with a question that started me thinking. It went something like this. "My battery is showing 6.42 volts. I should be okay for another flight, right?" It would soon be dark and even a quick charge would have likely ruled out another flight. I so rarely check my battery voltage these days that I was not immediately sure how to respond. Of course it would be easy to say to play it safe and charge, but was it really necessary?

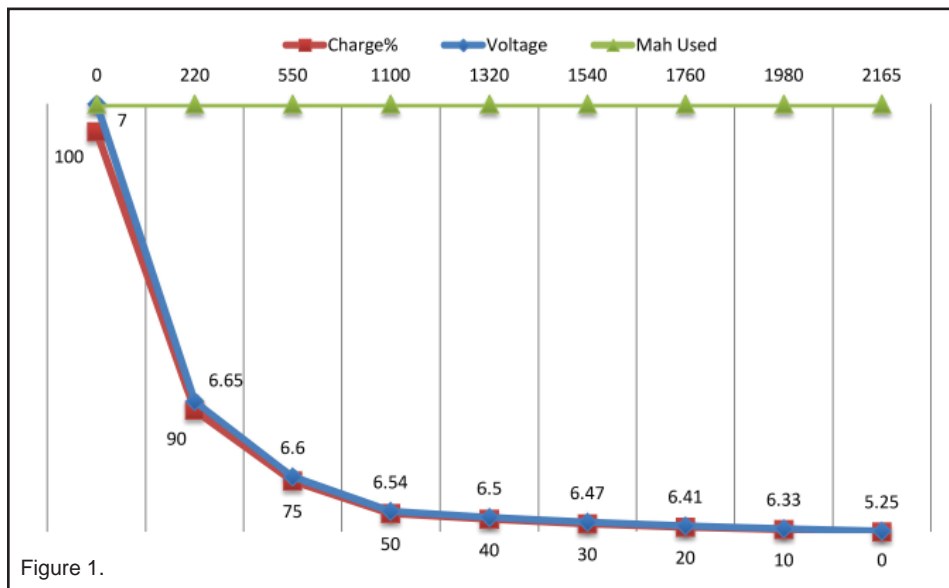
In the past, most users of LiFe batteries didn't look at voltage output of a LiFe pack as the measure of whether to fly. Aficionados of the LiFe batteries have all been taught to charge and fly a couple flights and then calculate our usage per flight. Repeat this a few times and then get an average mAh used per flight and divide into the pack capacity and you have an idea how many times you can fly without running low on battery power. It's sort of like running your car without a working gas gauge. You know you can go 200 miles on half a tank so you make

sure to fill up every 300 at least, 200 if you're the cautious type. We adopted this method with LiFe batteries because of the aforementioned characteristics of these batteries. The range of usable output voltages is constant and putting a load on the battery—even if it's mostly dead—does not help make the test any more accurate. LiFes simply don't sag any more under load at 90% depleted then they do at 10%.

Looking for answers, I started researching on the Web as well as running some tests on my own and here is what I discovered. First, a loaded volt meter (the very thing we need for NiCad and NiMH cells) is the wrong tool in this case. The load applied by the meter is too small to be useful in the LiFe world, putting virtually no strain on the battery, but could cause an issue because every connection in the system can show a small voltage drop when enough current is pulled through it (extension leads, switches, etc...), which may throw off the accuracy of the reading. This might also result in different readings depending on where in the system the measurement was taken (at the charge jack, balance lead, etc.). Add to this that there is no standard for exactly how much load such a meter places. I've seen 250 mAh, 500 mAh, 1 amp, and even 5 amp loads placed by these devices and the resulting readings would be all over the board. The only consistent reading seems to be an "at rest" or "no load" reading that imposes little or no draw on the batteries. This reading will not vary significantly no matter where the measurement is taken, within reason. With that in mind I have found references to and then did my own tests of no load voltage readings of a LiFe two-cell pack.

What I found can be seen in Figure 1.

First I drained my pack to 2.5 volts per cell, a conservative low-voltage cutoff for LiFes that will not harm them in any way. Some chargers use 2.0 volts. (I used a different charger to run this whole procedure with the cutoff set to 2 volts



A123/LiFe MONITORING

continues on page 6

CURING A LEAN ENGINE MYSTERY

Bob Mandeville (n1edm@comcast.net), Wingbusters Model Airplane Club, Halifax MA

This was an odd sort of problem. It began when I swapped out the Magnum .91 on my AeroWorks Edge 540 to get some run time on a new engine that I wanted to use on a new project. The new engine started okay, but when it flew, everything seemed to be off. There wasn't the power that I used to have; the high speed needle (HSN) and low speed needle were both way out of adjustment.

I reinstalled the original engine, and had the same problem. Then, just because I had it, I dropped in a third engine—to confirm that it wasn't the engine itself—with the same result. That confirmed it was the fuel system.

The key symptom was that I could not get a good pinch test from the engine. It had all the indications of a lean-running engine. Even with the HSN opened 4-5 turns, I was not getting a pinch check. During that first engine swap, the fuel system had been checked out just to be safe. Obviously, that had to be the reason,

but what did I do to create this problem?

The Edge's tank was pulled again and the three-line fuel system was checked over very carefully. After about two beers, my vision suddenly cleared and I had an *aha!* moment. Look at the picture on the right. What do you notice about the clunks?

Like most three-line systems, this one has two clunks; one to the fill line and one to the carb line. The picture shows one clunk with a large feed hole to let lots of fuel through. The other clunk has just a slit and a small hole. Guess which one was connected to the carb inlet line? Here's a hint: it wasn't the one with the large feed hole. That clunk with the slit would be fine for feeding your .40 or .46, but there was absolutely no way that it was going to let enough fuel in to run a .91. That undersized clunk was the cause of the lean runs. The clunks were swapped and the problem vanished. The clunks had been inadvertently swapped

during the rebuild.

This is being written to give folks a heads-up if they run into the same problem somewhere down the road. A clunk is a clunk is a clunk, right? No, they're not. Ask me how I know! →



TEST FLYING A NEW RC AIRPLANE

Bob Wilson (3dbob37n@frontier.com), Macon Aero Modelers, Franklin NC

All too often pilots—knees rattling and fingers shaking—taxi a new model out to the runway and begin what turns out to be a disaster. Rather than calmly analyzing feedback from the model, there is a flurry of stick yanking and jerking and a crash.

Successfully testing a new model is more of an attitude than anything else. It requires calm analysis by reading what the airplane is trying to tell you and a good dose of planning ahead.

The planning ahead part involves being sure you have taken all the preliminary steps while building or assembling the model to make sure the engine is properly mounted, fuel lines are free of kinks, that the correct CG is there, the engine is tuned in, and myriad other small details that it takes for a model to fly well. A good carpenter will measure three times and it follows that the details of an airplane should be checked three times as well.

How many times have I seen the fuel line to the engine connected to the vent line instead of the pickup line? How many

times have I seen the lack of a screw to hold a servo arm in the servo, or gas engines/mufflers bolted on without using thread lock? It's a good idea, once the model is finished, to go back through the manual and read and check each step of the construction/assembly process. Check and check again. For added comfort, enlist the aid of another builder to critique your work.

Then, when you taxi out for takeoff, you will know that everything is as it should be and that you haven't forgotten some important detail. If you are a pro, you may be able to put the model together in short order because you know what to look for and take care of the details almost automatically. But, if you are a bit less than an expert, take your time and don't worry about how long it takes. Be meticulous.

If you've taken care of the details ahead of time, there really shouldn't be any surprises to catch you off guard and most likely the model is going to fly just fine.

The pros refers to the model's first flight as a trim flight. They don't consider it as a "test flight." They know the model is going to fly and it only becomes a matter of trimming it.

If you are flying a model with a low power-to-weight ratio, fly level for a few seconds immediately after takeoff to build up flying speed. If the model climbs, apply a little down elevator, if it turns one way or the other, make the necessary corrections, but by golly don't start yanking sticks around. Chances are the model isn't going to be very far out of trim anyway. When you get to altitude, then begin correcting with the trim buttons on your transmitter.

The first flight is a culmination of your having taken care of all the little details and, if you are confident in your work, there is no need to panic. So taxi out, relax, take a deep breath and line up for takeoff, check your control movement one last time, and after that, "just fly the damned airplane." →

A123/LiFe MONITORING continued from page 4

and the results are almost identical. The last .5 volt drop happens very quickly and is well outside any usable charge level of the pack) I then fully charged and noted the capacity. My 2300 pack showed a capacity of just over 2200 mAh. I then set my charger to discharge the pack at a rate of 2.3 amps. This is a 1C rate and is near what I believe my 30% Slick draws, on average, during flight. This is based on some past observations. (On a repeat test using a similar pack I used 1 amp and found similar results, so I don't believe the rate of discharge is particularly relevant to

but then levels off quickly and is only down to 6.33 volts at 10% remaining. I.E. Approximately the same voltage drop from 90-10% of capacity as we got in the first 10%! So, if I were to draw a green/yellow/red scale as many of the old loaded/expanded scale meters did... it would probably look something like Figure 2.

Based on past recharge experience in the plane I know that the receiver and servos draws 100-250 mAh per 10-minute flight and the ignition may draw another 80 mAh.

Let's round up to a worst case scenario

conservative, and wouldn't be surprised to get 10-12 full flights without dipping down past the 6.5 volts level. I rarely actually fly 10 minutes and my maneuvers do not include a lot of demanding 3-D maneuvers. I will attempt to report back with more real world measurement at that time.

So what would my answer have been to my friend? Considering he is flying a much smaller airplane that likely draws far less power per flight and, being a glow aircraft, there is no ignition to account for, I would have told him to fly with confidence and simply monitor his battery after every flight since he was already below 6.5 volts and has a single LiFe pack.

So in conclusion I believe that a voltage measurement, if done correctly and backed up by experience with the aircraft in question, can be a useful tool for monitoring your LiFe battery packs. All it takes is a bit of know-how and practical experience to stay safe using this new battery technology.

It should be noted that this test was using true A123 brand batteries and has not yet been verified using other brands of LiFes. I do not expect significant differences would occur. A123s are just more capable of high rate charging and discharging than other brands, but that is largely irrelevant to the data presented here. Voltage levels are constant across brands in my experience so the above presented measurements and calculations are still valid with other manufacturers.

One last note: In order to keep LiFes in good working order you want to use an appropriate charger with balancing capabilities. Keeping your batteries in good condition and having access to the proper connections can be a challenge, but is doable with the right equipment and know-how. →

Jack's Expanded Scale Volt meter for LiFe batteries



Figure 2.

the at rest voltage measurements.)

I then went through a procedure of discharging the pack, pausing at various times and measuring the packs at rest voltage with a standard Digital Multi-Meter (DMM). DMMs are designed to place very little load on the circuit under test and therefore do not affect the readings significantly. They are also inexpensive. I also did these measurements with varying times at rest before making the measurement and found that the battery will recover slightly over time giving a somewhat higher reading. This change is small and likely not a concern so 1 minute or 10 minutes after the flight appears to be largely irrelevant.

As can be observed, the pack dropped markedly in the first 220 mAh/10% (90% capacity remaining)... from 7 to 6.65 volts,

of 350 mAh per flight. That means at the 40% remaining line (1320 mAh used) I have two/three flights left over on a single 2300 mAh pack and have already flown almost four full flights. Now consider that I have two packs onboard and I actually have eight flights accomplished and perhaps five in reserve. So my green safe-to-fly zone would be from 7 volts to 6.5 volts. To be safe I would say my yellow line starts at 6.5 volts with a good reserve and extends down to 6.4 volts. My red line would be at the 6.4 volts level with just under 20% remaining. I would not fly this aircraft below that level. This allows for 10 full flights and a reserve of two with a small buffer.

I will test this with some real flying in the spring but expect that this whole calculation will turn out to be overly

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WING PATCHING; EASY AS 1,2,3

Peter Duszkievicz, Tri-County RC Club, New Jersey

We all have to get to the field and in doing so we always move our airplanes. During the life of a model it will get dinged up a bit, and eventually we all end up poking a hole in the wing, whether it's in the car or hitting a bush. In this article I will demonstrate three easy steps to patch those holes in the wings.

To perform a successful patch on a wing you will need the following:

- Covering iron
- Rubbing alcohol
- Trim solvent or acetone
- #11 blade hobby knife and scissors
- Marker (Sharpie)
- A ruler
- MonoKote to match the patch
- Windex

To understand what we're patching, here are two pictures of the damage that we will fix. Figures 1A and 1B show the type of damage that we're working with.



Figure 1A



Figure 1B

Clean the surrounding area where the patch will be applied with Windex. For good measure, you may also want to use some rubbing alcohol to wipe down the area, making sure there's no fuel residue on the wing, and to give it a final thorough cleaning.

After you have cleaned the area, use your hobby knife (with a #11 blade) to cut away the damaged area. I typically cut a larger area so the patch is easier to apply and

conceal.

In Figure 2A I have cut out a square from leading edge to the main spar and from one rib to the other. In Figure 2B I drew a straight line where I would overlap a patch instead of cutting from rib to rib. The reason I did this is to minimize the work for diagonal strips that are shown (black and yellow), mostly because I was out of yellow MonoKote.



Figure 2A



Figure 2B

The final step is to apply the patch. Before you start cutting your patch, turn on your trim iron so it gets hot and it's ready for you to use. When cutting your patches cut them large enough so that it overlaps at least $\frac{3}{8}$ of an inch. This will ensure that the patch does not shrink when you iron it on or hit it with a heat gun. I typically do not use a heat gun just for that reason. Remember patience here will pay off with a good repair.

When I apply the patch, as in Figure 3A or 3B, I spray a towel down with Windex and wipe it onto the wing around the border. The wet Windex helps to position and keep the patch in place as I begin to heat it with the iron. When I did the repair shown in Figures 1B, 2B, and 3B, I applied the white patch first. Hint, you always want to patch with the lightest color first so that the darker colors do not bleed through the lighter ones.

After placing the patch, I begin to iron it on into place as follows:

1. First tack each corner just before the edge of the patch. You should

here the sizzle of the wet Windex.

As it bubbles, move the iron forward towards the edge of the patch. Do this step for each corner.

2. Then using the iron, tack the patch at each center between the four corners. Work the iron towards each corner, and then out towards the edge of the patch. Do this for each side of the patch.
3. Finally, after all the edges are sealed, gently run the iron over the patch itself. Start at the center and move out to either edge. Heat control is key here not to get wrinkles or excessive shrinkage of the patch. Do this until the patch is nice and taut.
4. An optional step—necessary for the patch in Figure 3B—is to apply any trim to match the original pattern. In the example shown I used black MonoKote trim (the peel away kind) and trim solvent to apply it. Alternatively you may use iron-on covering by applying trim solvent to the area where trim will be applied and then placing the trim on top of it. The wet trim solvent will allow you to work out any air bubbles, but you have to work quickly. Once the trim piece is in place I go over it with an iron set at a lower heat setting to ensure it's tacked on properly.

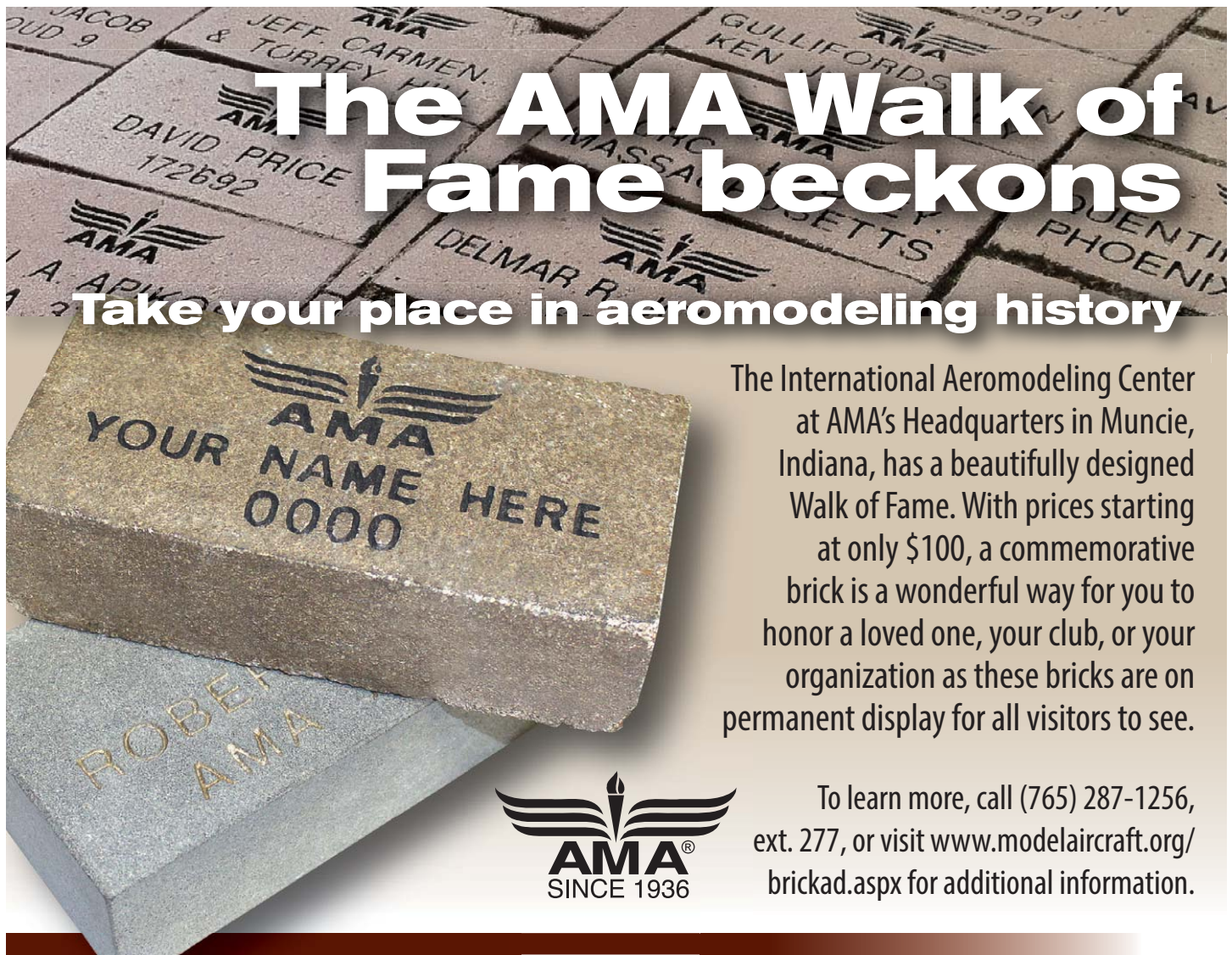
If you performed the steps correctly, the patched areas should look like the ones in Figure 3A and 3B. →



Figure 3A



Figure 3B



The AMA Walk of Fame beckons

Take your place in aeromodeling history

The International Aeromodeling Center at AMA's Headquarters in Muncie, Indiana, has a beautifully designed Walk of Fame. With prices starting at only \$100, a commemorative brick is a wonderful way for you to honor a loved one, your club, or your organization as these bricks are on permanent display for all visitors to see.



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