



Dec 2009 Issue 281

REPORT

ONLINE!

*Merry Christmas and
Happy New Year
from RC Report Online!*

Micro Mustang



Wait for it!!

Wait for it!!

Mini P-40 ARF



Two Great Christmas Gifts!

RC REPORT **ONLINE**

December 2009

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poop from the dog house



DEMOTED AGAIN!

Boy, I'm in big trouble now! I'll let Tony explain the whys and wherefores, but I'm no longer the editor of this here ragazine. When the printed magazine went out of business, I pretty much automatically lost my jobs as its owner, CEO, publisher, editor, graphics artist, advertising director, financial officer, and assistant janitor. Shortly afterward, however, when Tony and Julia Coberly decided to take it online, I was hired to be the editor of the online magazine, and to continue writing a monthly editorial. Now even the editorial position is gone. And since I'm not a good writer, and I lack the necessary expertise on any particular R/C subject to author a monthly column, I may be out of a job altogether!

I'll still be contributing in any way Tony wants me, however. It would take me a very long time to repay Tony for all the favors he did for the printed magazine. Just how this will all shake out remains to be seen, so do stay tuned!

THANK YOU

Thanks to all those who responded to my November editorial, by sending their kind condolences and best wishes regarding our dogs (Mina and I lost two and got two new ones this year). I received more reader responses to that editorial than any other I've written for R/C Report Online. And for those who are interested, both of our new puppies are doing very well, except they're growing far too quickly! The older one is already able to leap up on the furniture!

Anyway, it's heart warming to know that so many modelers are animal lovers. Bless you all!



Photo 1: My “Stanley” Flight Box on wheels

MY FLIGHT BOX

I don’t even recall writing about or showing photos of my flight box, but I reckon I did, because I got several email inquiries about it. Most simply wanted to know what it is and where I got it, but some also had questions about the flap-compartment on the lower front face, and the fuel container I used.

The box itself (see **Photos 1-3**) is a two-part, black and yellow plastic tool and parts carrier made by Stanley, and I got it at Home Depot about three years ago. I’ve seen several different versions and sizes of the same basic concept (Tony Coberly uses a similar but much larger version), not all of which are made by Stanley. I chose the smallest that I felt would meet my needs. The removable upper section includes two handles, one for lifting and carrying just the upper section, and a larger, fold-up and locking handle with which to roll around the two coupled sections.

The upper section has two external compartments (with snap-lock lids) on the very top, and a removable tool tray inside. It also has an externally accessible yellow semi-circular pivot tray (aka, Lazy Susan) at the very bottom.



Photo 2: The upper section has a hinged lid with two external compartments with lids (see Photo 1), a removable tray, and a pivoting tray with many little compartments for small parts.

The wheeled lower section has a pretty large internal capacity, but no compartment segments or removable trays. It’s deep enough to hold a standard one-gallon metal can, and *almost* deep enough to hold a standard plastic one-gallon fuel jug (more on that shortly). This is my “Fuel and Power” compartment, in which I put my electric starter, a large chicken stick, a lawn tractor-size 12 volt battery, an electric fuel pump, and a gallon jug of fuel.



Photo 3: The lower section has wheels and the two clamps at the sides that lock the upper and lower sections together. The fold-down compartment is something I added (see text). Note the shortened fuel bottle (see text for details).



Photo 4: Here's a better look at the contents and arrangement of the lower section which is my "Fuel and Power" module. The fuel pump is mounted on the front face.

Since the lower section goes on the ground where I start my engine-powered models, I wanted an easily accessible compartment for my NiStarter, prop wrench, tachometer, and some spare props (up to 11" in this case). For this I made a shallow box (more like a tray, actually) from 1/4" lite ply (see **Photo 3**). I then hinged it to the plastic lower section, and used a magnet to keep it closed. The NiStarter, prop wrench, and tachometer are secured with Velcro. The spare props are stored on a 4" long 10-32 screw.

THE FUEL BOTTLE

As I said earlier, the lower section of my flight box will readily hold a standard metal one-gallon can. Since the can has a rectangular shape with only slightly rounded corners, it actually takes up less space than a plastic one-gallon jug. I chose to use a plastic jug, however, because I didn't want a metal can mixed in with all the wiring attached to the 12 volt battery. Metal cans also sometimes have rust issues, and I can't see the fuel level in a metal can.

A standard plastic one-gallon fuel jug with top-mounted fuel lines, however, is about an inch too tall to fit inside the lower section without interfering with the upper section. Since I was probably assembling my new flight box at 3:00 a.m., I chose a simple and immediate solution. I took an empty fuel jug, heated the upper area with a heat gun, and mashed it down until it was short enough to fit (see **Photo 5**). I



Photo 5: From left to right, a normal one-gallon fuel jug, my shortened fuel jug, and a standard size one-gallon can. Note the different heights. The can fits best, but it has its drawbacks.

measured it once, and I think the shortened jug still held nearly a gallon.

What I *should* have done is find a see-through plastic jug with a more suitable shape. With the appropriate measurements in hand, take a hike through any grocery store or drug store and just look at all the various plastic container shapes available. A one-gallon milk jug would work nicely if you could find one with a tight-fitting, screw-on cap. Nowadays, though, most of the milk jugs I see have little pop-on caps that I don't trust with fuel.

While writing this article, however, I switched to a 90 fluid ounce "HalfLyte" container (see **Photo 6** below) that some of you will recognize as being part of the preparation kit for



Photo 6: My new fuel bottle is the 90 fl. oz. container at right. See text for details.



Photo 7: Granted, this particular container does not hold a full gallon, but 90 fluid ounces is enough for me, and it fits soooo much better. It's not even as tall as my lawn tractor battery!

having a colonoscopy! Its shape seems almost as if it were designed to fit into the space I use for my fuel bottle! But wait, there's more! Call now and we'll include two free bonuses! One is that the new container's screw-on cap is interchange-

able with those that come on our glow fuel jugs! Secondly, its shorter height and better corner-fit takes up less space! Now I can carry more stuff! I don't know just what stuff yet, but more is better, right? I'll figure out something.

Ah, but is 90 fl. oz. enough? Well, for me it is, yes. Why, I can't even remember the last time I needed that much glow fuel on one outing. And now that I fly electrics so often, the likelihood that I'll need that much glow fuel on one day is minuscule. I'll carry an extra gallon to distant events though, just to be on the safe side. Your mileage may vary, however, so choose your fuel container accordingly.

By the time you read this, Thanksgiving will be over and gone for another year. I hope yours was wonderful, and that you enjoyed eating too much. Now it's time to get out those Christmas lights and decorations. So until next time, y'all come back again soon, y'heah?

-Gordon Banks
glbanks@knology.net

Tony's notes regarding Gordon are addressed in this month's Sparky's Revolt

REGAIN CONTROL

Losing control can be a nightmare. The wrong response to a given command can take its toll, on your model, your nerves, and your wallet! At Radio South we know how you feel about your hobby. We too are avid RC enthusiasts with nearly half a century of combined experience in modeling and radio repair. So, avoid inflated repair costs and undue service time — call **Radio South** for fast, economical, in-house radio service, that you can depend on. "At Radio South, customer satisfaction isn't just a motto. It's our way of life." Let us put you back in control.

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Bird on a Wire

by Terry Dunn

As I write this, I've just returned from the Best Electrics in South Texas (BEST) event held in New Waverly...a little north of Houston. This is the one event that I go to every year. It is my chance to catch up with my friends from the Dallas electric scene as well as other pals distant from my little corner of Houston. This year, I decided to "camp" at the field in a rented RV. Despite a rosy forecast, the weather was pretty miserable all weekend long. We had chill (relatively speaking...of course), wind, rain, and a constant overcast that never once revealed the sun. Despite all of this, it was by far the most fun I've had at BEST. I think it was due to being immersed in the activities of the event all weekend long.

The gloomy overcast on Saturday didn't seem to deter anyone from making the trek to New Waverly, and it certainly didn't keep anyone from flying. The grass runway was very soggy, but almost nobody had any trouble taking off or landing...a tribute to modern electric power systems. Sunday started out with showers that stopped occasionally to allow a little flying, but Saturday was still the pinnacle of the weekend. On Friday and Saturday night, there was night flying with several different types of models. Some airplanes used onboard LEDs to illuminate themselves while others were tracked from the ground with a powerful flashlight. Both methods were fun and challenging. I'll definitely be building a night-flyer of my own in the near future.

As usual, there were lots of unique and interesting models to behold. I'd like to show you two of them that I thought were standouts.



Jason Hill's scratchbuilt B-52 foamy casts a convincing profile during a low pass at the 2009 BEST event. Jason earned the Best Technical Achievement award



First is an 86" wingspan B-52 belonging to Jason Hill of Shreveport, Louisiana (photos 1 & 2). Jason scratch built the model from foam using 3-view drawings. It is propelled by six small ducted fan units (four Great Planes Hyperflow 56mm fans and two Wemotec 50mm fans), powered by two to four 3S-4900 mAh LiPo batteries in parallel (More batteries in parallel provides longer flight times, but the same output power.). Full power is about 1100 watts. The big Stratofortress features retractable landing gear and functioning bomb bay doors. Jason can drop a variety of ordinances ranging from Nerf bombs to candy. Depending on the number of batteries used and the payload, the flying weight is anywhere from nine to eleven pounds. All other flying stopped when the B-52 took flight at BEST. Jason's big bomber earned Best Technical Achievement award.



The next belle of the BEST ball is Ed Couch's 140" wingspan Ziroli C-47 (photos 3 & 4). The model weighs 52 pounds and uses two Turnigy 8085-250 brushless motors swinging 17x8 3-bladed props. Each motor draws power from a dedicated 10S 3700mAh battery located in the respective nacelle. Ed did a great job of flying the big Gooney Bird for the crowd. He was rewarded with a big round of applause before the chocks were in place... oh, and the Pilot's Choice Award.



The best part of Ed's C-47 story is the history behind the plane. The original builder/owner crashed the plane due to a radio glitch during landing at a scale contest. The crash ripped off both G-38 gas motors while also damaging the nose and the forward part of both nacelles. The unrepaired model then languished for 14 years in an empty bedroom before serendipity brought Ed and the plane together. Ed spent about 100 hours over a period of 31 days converting the model to electric power and expertly repairing the damage. You can see the pride in his face when he flies the C-47, or even just talks about it. It is definitely a stunning and unique electric war bird.

The ideals which have lighted my way, and time after time have given me new courage to face life cheerfully, have been Kindness, Beauty, and Truth. The trite subjects of human efforts, possessions, outward success, luxury have always seemed to me contemptible.

Albert Einstein



Ed rolls the big Gooney Bird back to the pits after a flight. He reserves this stoic expression for the camera-toting paparazzi, but he's really a nice guy.

The China Syndrome

A few years ago, I needed a jig saw for a project at home. Being a socially conscious person, I decided that I would spend the extra money to buy a saw made in the US. After trips to several stores, I gave up any hope of finding an American saw. My consolation goal was to buy a saw made anywhere but China. More searching yielded nothing but "Made in China" stickers. I finally capitulated and came home with a Chinese saw in my hand and a dejected feeling in my soul. My jigsaw experience is a close parallel to the modern hobby industry. Thankfully, there are still a few American companies that design and produce their wares right here in the US (DuBro, Castle Creations, and Tejera Microsystems Engineering come to mind.). However most of the stuff that we buy in our local hobby shop or online comes from someone who imported that product from overseas. Sometimes it has crossed the Atlantic Ocean, but the Pacific is a more common route. Eastern Europe used to be a source for very high quality, yet affordable equipment, but the rise of the Euro coupled with the fall of the US Dollar has made the Czech option less attractive. More and more, Chinese products are becoming the only kind available. I doubt that this observation is news to any of you. My point in bringing it up is to discuss a new market that has emerged.

Within the past few years, it has become more common to buy Chinese products directly from China. Several vendors have popped up that offer products through EBay (an internet auction business) or directly through their own websites. Other than

the mail carriers, there is no middle man involved. You send your money (usually electronically) to a guy in China and he sends you the hobby widgets you want. By far, the biggest appeal in buying directly from China is low prices. Cutting out the middle man really has an effect here. Even after you factor in overseas shipping, things such as motors, batteries, and servos are a fraction of the cost compared to stateside prices. For example, I recently purchased LiPo batteries for the Model Tech Super Cub that I reviewed. The battery is a Turnigy 5S-5000mAh from HobbyKing.com (aka HobbyCity.com) - one of the most popular Chinese dealers. I bought two of those batteries for \$50 each, plus a few small odds and ends. Shipping was about \$40 and it arrived on my doorstep in one week. I shopped for equivalent batteries at a number of US retailers and found nothing less than \$200 each, plus shipping. That is a tremendous difference. I'm sure that those of you who have purchased directly from China-based vendors can provide a wide array of success stories and horror stories about your experiences. Determining the heavier stack would likely be based on your interpretation of the stories, coupled with how you value things like quality control and customer service. I'll discuss both of those topics in more detail below. However, the decision to buy from China is more complex than a "Coke vs. Pepsi" comparison, and I'll touch on that as well.

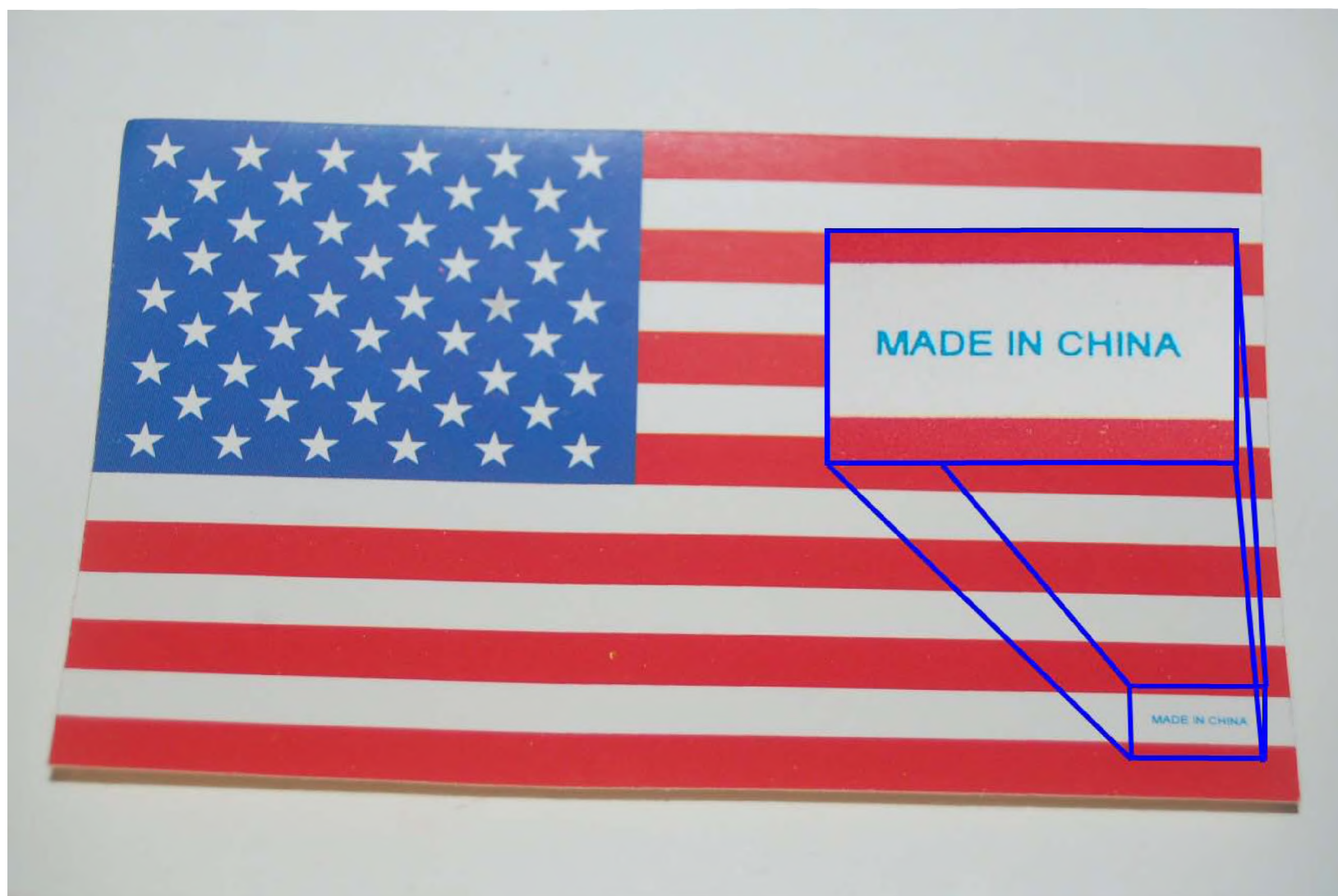
Now let's talk about quality control. Sure, cutting out the middle man drops the price, but it also negates some other factors of which we are accustomed. The lack of an American-based importer or distributor to inspect and place their seal of approval on incoming products introduces an elevated element of risk to the buying process. This quality control blessing is just one way that importers can justify their price markup. That being said, I have to admit that even without stateside oversight, the quality issue in China seems to be improving dramatically. A few years ago, I think the Chinese vendors would have received a unanimous "F" for the quality of their products. More recent history would show them with a "C", which I interpret as "not bad... for the money." Nowadays, I think that many Chinese brands such as Turnigy and Hextronic have moved into the B+/A- range, placing them on par quality-wise with many US-imported brands. I'm sure there are exceptions, but it would

seem that we have turned the corner on the issue of all Chinese products being junk. That just isn't the case anymore.

Another factor that justifies the profit of US-based importers is that they generally provide a means of customer service. Whether it's a "1-800" number, website, or even a local field rep, there is usually someone that you can talk to (in English) when you have problems. You forfeit most of that assurance when you buy directly from China. You can usually find an email address to report your problems. The response you get may be very helpful, very pidgin, or very non-existent. I have received all three versions.

Most of the direct-buy modelers that I've talked to don't seem very concerned with quality control or customer service issues. They see hobby products (especially low-ticket park-flyer items) as disposable. A faulty servo purchased from your local hobby shop is probably worth the drive back for an exchange. However, a bad \$3 servo from China warrants little more than a fade away jump shot into the garbage can. An \$8 brushless motor with a broken magnet can easily become an \$8 paperweight. For many of us, the occasional reject is just part of doing business directly with China. If you've been on the fence about ordering from China, there is ample evidence that many of these businesses are indeed legitimate. If you send them your money, you will most likely get something in the mail, and that something will probably be of good quality. Given that reassurance and the sometimes unbelievable low prices, the decision to buy direct seems like a no-brainer. However, for many of us, our conscience steps in and makes the decision much more complicated. Sending your money to a foreign country is not something to be taken lightly. Here are a few additional things that you may want to consider.

My first point is a political one, and it applies whether buying Chinese products directly, or through importers. China is a communist nation. When swarms of Chinese soldiers crossed the Yalu River in 1950, it must have been pretty obvious that China was a sworn enemy of the United States. Now, things are much more complex. As a nation, we stand opposite China on the issues of politics, human rights and the environment, just to name a few. Yet, we have no problem utilizing their cheap labor to manufacture just about every consumer



You're kidding me, right?

good we buy (my favorite are American flag stickers with “Made in China” printed on the bottom white stripe (photo 5). This dichotomy of international relations makes no sense to me, yet I feel powerless to oppose it. (*Wow! Big word there Terry, have you switched back to the “Word of the Day” toilet paper again!!*) To boycott Chinese products would basically mean ceasing to exist as an American consumer.

I'll close the political segment with one more anecdotal tidbit for you to digest. I recently heard a story (2nd hand) of an RC importer who visited the Chinese factory where his ARFs are made. He was shown the model airplane production line, but was forbidden from seeing any other area of the factory. Why? Because they were producing weapons for the Chinese military. Does some percentage of our money spent on RC products, microwaves, or particleboard furniture help to subsidize a communist army? I don't know, but it might. That's heavy stuff to think about for a cheap LiPo.

Honestly, these political issues don't often factor into my hobby purchasing decisions.

For the sake of argument, let's accept the fact that “Made in China” is here to stay for awhile. That allows me to discuss points that relate to buying directly versus through importers. Obviously, if you buy directly from China, nobody in the US will profit from your purchase. If you take that to the extreme, it is easy to see that we will soon lose the hobby shops and online vendors based in the US. Then you are stuck buying all of your RC stuff from overseas. I've made peace with this situation by consciously spreading my hobby dollars. While I do make the occasional direct-buy purchase from China, I make sure to spend a majority percentage of my RC budget locally and with my favorite US-based online vendors. I'm sure that I could save some money by purchasing more things directly, but I sleep better knowing that I'm supporting American entrepreneurs.

My last point is the one that tortures me most. I believe that many Chinese vendors have little respect for intellectual property, i.e. trademarks, copyrights, patents, etc. For example, the Hobby King website has several airplanes that are blatant knock-offs of Multiplex designs. They have another airplane called "Zagi", which is a name trademarked by Trick RC several years ago. Maybe the Pacific Ocean provides an adequate buffer against legal retribution. However, I do know of a case where a Vietnamese ARF manufacturer was strong-armed by their US importer to pay royalties to the American from whom they stole a design. I don't know squat about patent law or international business, but as a consumer, this casual theft of ideas sure seems like dirty poker to me. Maliciously profiting from the research and development efforts of other people seems like a great way to stifle future R&D dollars. No R&D means no new products. I definitely won't buy any of those copycat planes from Hobby King. If my conviction were made of stronger stuff, I'd boycott Hobby King completely. However, the allure of really cheap motors for my hair-brained projects keeps me from turning my back on them. If I ever see evidence that their motors are also stolen

designs, then it would be "adios Hobby King." For now, I'll remain cautious and selective about what I buy from them.



The choice to buy directly from China is a personal one and I won't try to sway you one way or the other. I've brought up these points merely to share some of the factors that I consider before I click the "submit order" button. If you have any conflicting opinions or further points to consider, please share them. That's all for this month.

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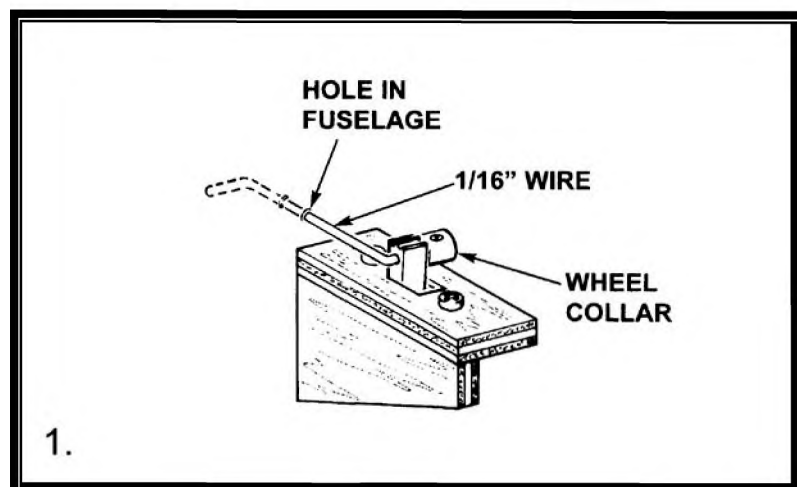
It's been interesting reading the ideas submitted for this column. They ranged from really new and innovative to methods I've been using for more than fifty years. At first I tended to set the old, basic, common sense ideas aside. After a while, I thought more about it and realized that many new flyers may not have any idea how to do some of the basic building procedures that some of us take for granted. Most of us old-timers used to have to build an airplane before we could go fly. If ARF's had been available then, most of us would probably have taken advantage of their time, labor, and sometimes cost saving advantages, too. Maybe the new guy has only assembled RTF's or ARF's, and even needed help from more experienced builders to accomplish that. In some instances, because of time constraints or lack of confidence, maybe they even had someone else assemble their ARF's. If you think about the planes seen at the field every week, the vast



majority, at least at our field, are ready-built types. I have, and enjoy, a number of ARF's, too. Today, most new R/C flyers simply don't build their own airplanes! So, if you see something in this column that you already do, bear with me. Those new guys you're helping learn to fly may eventually develop the incentive to create their own planes. They're probably going to at least have to learn to repair them. He, who has never crashed, probably hasn't flown much without an instructor and buddy box! I need some input of new ideas! Can it be that our readers think all the good ideas have already been used in "Here's How"? The idea you submit may just make a new builder's life easier. Since ideas coming in for "Here's How" are in short supply these days, I'm going to visit some "golden oldies".

1. Switch Actuation: If you don't want to mount the radio switch on the outside of the aircraft, it can be actuated with a simple piece of wire and one 1/16" wheel collar. If the switch doesn't come

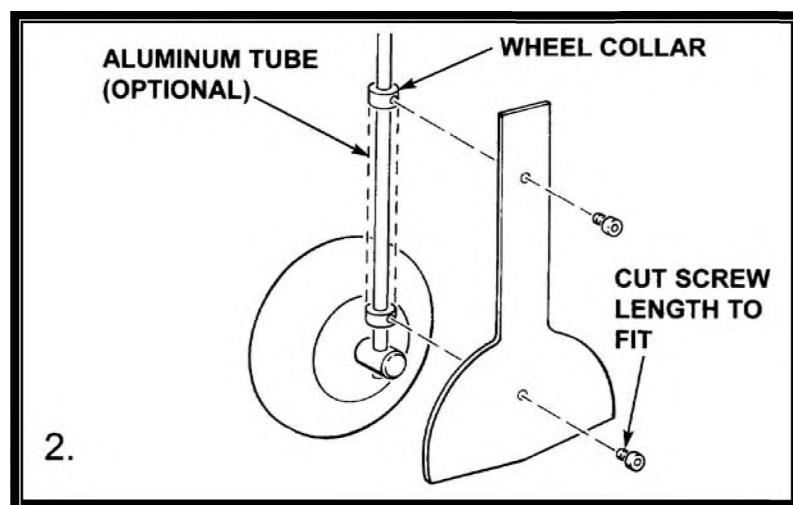
with a hole in the button, drill a 1/16" hole as shown in the illustration. Mount the switch sideways on the servo tray or make an appropriate mount with the switch movement perpendicular to the fuselage surface.



1. Locate and drill a 1/16" hole in the fuselage in line with one side of the switch button. Bend a piece of 1/16" wire to fit through the button with enough sticking out to allow a wheel collar to be installed. Allow about 1/8" of the wire to stick through the fuselage surface when the switch is pushed to the "in" position and bend the wire again. Cut off the wire with about 1/4" left to grip. Remove any burrs that might "stab" you and you're finished. Pull, or push, the protruding wire to turn on or off. If you're worried about the hole in the fuselage wearing larger, glue a small piece of plywood, or Popsicle stick, on the inside, before drilling, to serve as a bearing.

2. Landing Gear Covers: One item, when building, is how to hold scale-like landing gear covers onto the landing gear reliably, so they don't turn or come off. I use wheel collars in two locations to hold a typical cover in place. If the wire is to be bent on both ends, slip the correct size wheel collars in place on the landing gear wire before

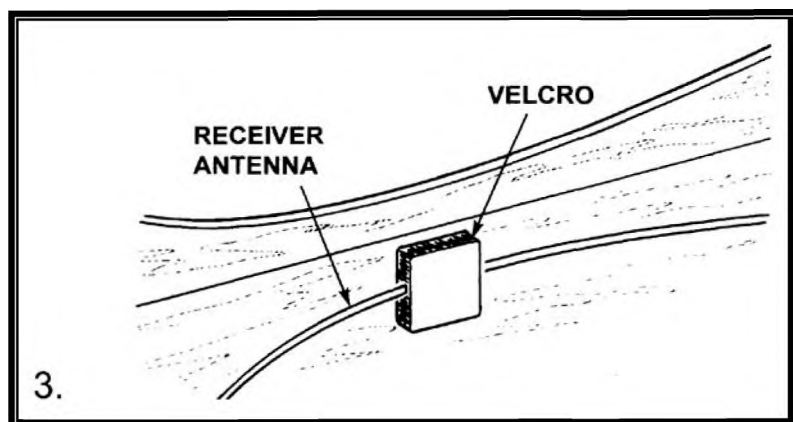
making the final bends. The addition of larger diameter aluminum tubing between the collars adds to a more "scale" look, if you're so inclined. Wrap the wire with a couple of layers of masking tape to keep the tubing centered. Select the correct size screws to fit the setscrew threads. Cut to length so it will tighten on the cover and serve as a setscrew to hold the collar in place. I use 0.016" aluminum for most covers and the thickness of a 4-40 hex nut is usually just right to establish screw length. Seat the nut against the screw head and, using a Dremel-type cutoff wheel, cut the screw flush with the nut surface.



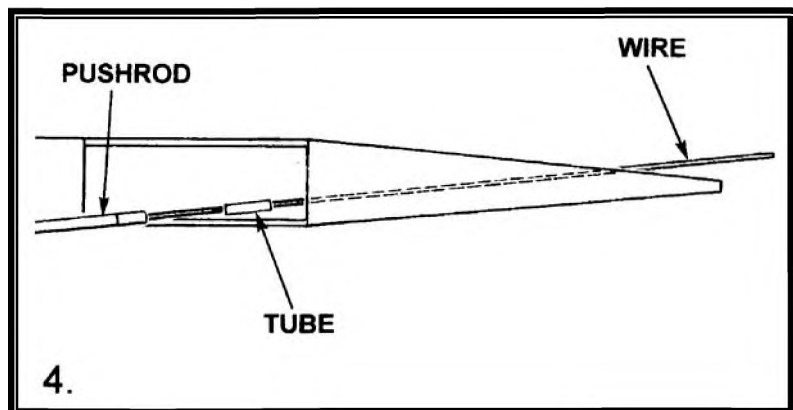
Removing the nut cleans up the threads and screw length is just right to hold the cover and lock the collars in place, in most cases. If plywood, or some other material, is to be used for the covers, adjust the screw length to fit. The type of screw head is optional, but the smaller, the better. Paint the screw head to match the cover and you're in business!

3. Antenna Anchoring: Sometimes it's desirable to route the receiver antenna around servos and hold it in place inside the fuselage. Typically, people use masking, or other, tape to hold it in place. Try using 3/4" square pieces of self-adhesive Velcro to hold it. The Velcro can be pulled apart to remove

the antenna and be ready to use again for re-installation. In case of a crash or other unscheduled landing, the antenna will easily slip through the Velcro where tape may hold it too securely and cause damage.



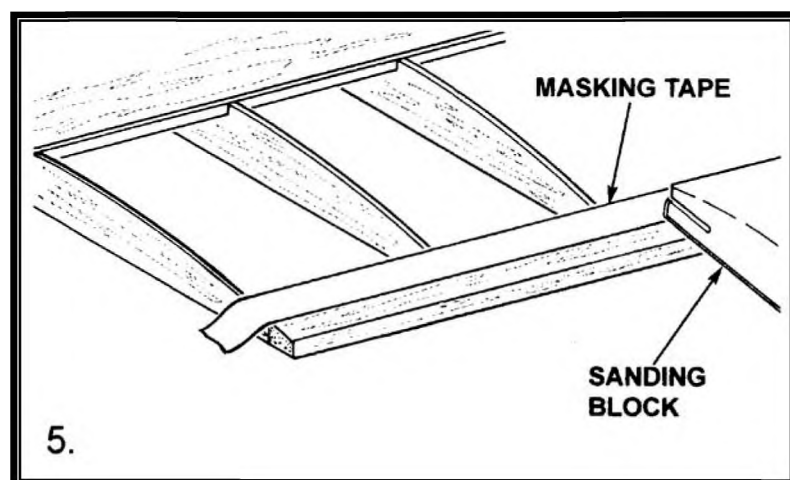
4. Pushrod Installation: When using dowel-type pushrods, it's sometimes difficult to feed them from the radio compartment through the slots or outlet holes in the aft fuselage. Next time it's required, try this: Feed a piece of music wire, the size of your pushrod, through the fuselage from the slot in the rear. Place a piece of snug-fitting tubing, about 1" long, onto the wire about half-way. Put the end of the pushrod into the other end of the tube and push the wire through the fuselage and out of the slot with it. Viola!



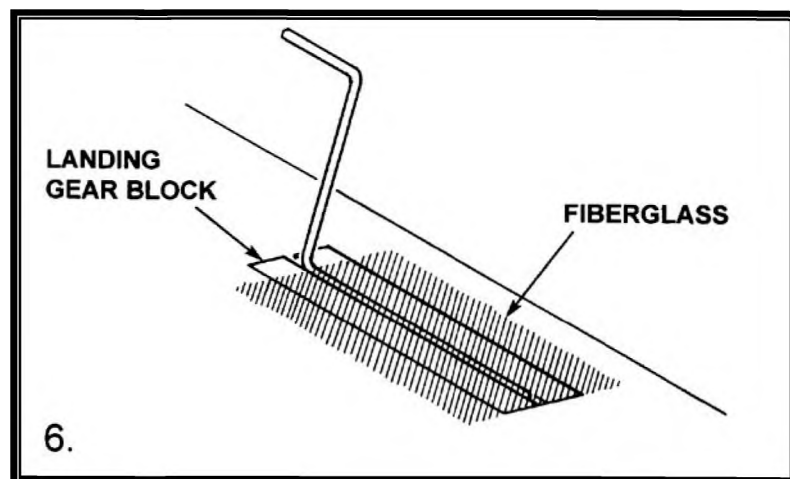
The pushrod is in place with minimal fuss. If the tube won't stay in place while being pushed through the fuselage, tape it or crimp it onto the wire.

5. Rib Protection When Sanding:

Sometimes when building, it's necessary to sand the leading or trailing edge of a built-up wing to shape. If not protected, the ribs can be chipped or broken if rubbed by the sanding block. Put a piece of masking tape on the ribs next to the surface to be sanded. It will help support and protect the ribs if you happen to rub them while sanding.



6. Retaining Fixed Landing Gear: If you have a fully sheeted wing and don't like seeing screws and straps holding fixed landing gear in the blocks, try this: Mount the gear blocks in the wing as usual. Put the pre-formed wire gear in place and epoxy a piece of medium-weight fiberglass cloth over the block and wire with about $\frac{1}{2}$ " to $\frac{3}{4}$ " overlapping onto the surrounding balsa sheeting. Outlining the area with masking tape will give even edges to the resin. Tape a piece of Saran Wrap or



similar material tightly over the area. Work out any wrinkles, as they will be reproduced in the finished fiberglass. When it's cured, remove the Saran Wrap, sand any imperfections, fill as required with spackle or your favorite filler. Finish or cover with your favorite iron-on material.

7. **Tightening ARF Coverings:** (No illustration) From Don Fitch, of St. Charles, MO. Frequently, when a new ARF or RTF plane is received, the covering will be wrinkled to some extent and require shrinking. Before applying heat to the wrinkled surface, go around the edges and be sure they are firmly sealed. Often, the shrinking

covering, which is cut to fit with minimal overlap, will pull away from the edges and leave an uncovered gap. When that happens, further repair is required with covering materials that may not be available in a matching type or color.

Send me your ideas!

This column is dependent upon your input.

Walt Wilson

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The BIG Picture

by Dick Pettit

It's December already, and most of the leaves have fallen off the trees in my back yard. I suppose I'd better take out the rakes and mulching machine sometime soon. I don't want to run my engines with all those leaves blowing around.

This month I have some photos of some beautiful scale warbirds, a nifty charger/balancer for A123 Lithium NanoPhosphate cell batteries and a description of how I used SIG Koverall and water base polyurethane to cover one of my large project models.

SEVERAL SPECTACULAR SCALE SUBJECTS

I received a photo CD from Marshal Emmendorfer from New Lathrop, MI, that contained a number of photos of his beautiful scale war birds. I tried to select the best photos and show them to you in this column.

Photo 1 shows his Bob Violett Models F-100 powered by a Jet Cat 120 turbine. Photo 2 is his Bob Violett Models F4 Phantom, also powered by a Jet Cat 120. Each of these models is capable of vertical out of sight performance.



Two beautiful Jets from Bob Violett



Photo 3 is a B-25 built from Nick Zirolì plans and is powered by a pair of Saito 170 three cylinder radial engines. Photo 4 shows the B-25 on a simulated emergency landing with one main gear still retracted.



Photo 5 is a B-17 powered by four Saito 115 four cycle engines and was built from Don Smith plans. The B-17 on an emergency landing with only one main gear extended in photo 6.



Marshall is the owner and builder of all these planes and many more. He does enlist assistance from a friend, Steve Pully, to do all the flying for him. He also adds that "...it takes a lot of work to keep four planes ready to fly, and that's why we have Bob Munsell...our flight coordinator..."

Excellent photos of some excellent looking models, Marshall.

CHARGE YOUR A123 BATTERIES EASIER

A few issues ago I wrote a little article about the way Lithium NanoPhosphate, commonly referred to as “A123” batteries, can be used in our R/C models. I mentioned several different battery chargers and adapters that will allow us to safely charge and balance the A123 cells. This month, I have a report on an updated version of one of those charger adapters from SLK Electronics, “The DapterRx”. That name could possibly mean “a prescription for safely charging A123 cells”, but that’s only a guess.

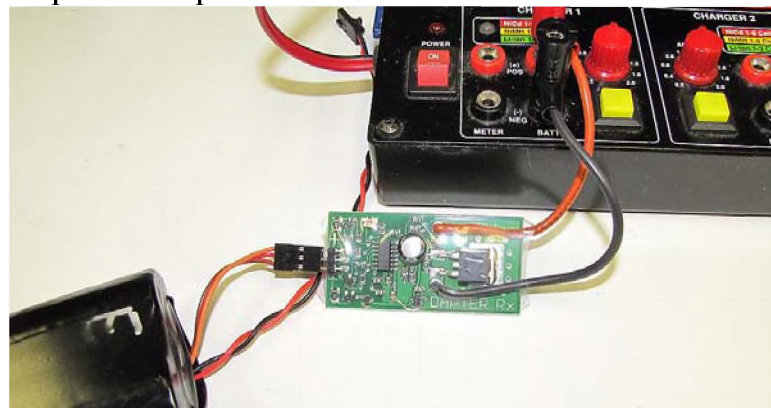
The DapterRx is a small PC board based adapter, as seen in Photo 7, that connects between the A123 two cell battery and a suitable battery charger. You have to make sure that the balancing tap on your battery is wired correctly to allow the DapterRx to charge and balance correctly. It can also be used as a non-balance charger by only connecting the positive and negative leads of the battery to the adapter.



After the wiring is verified and the battery plugged into the DapterRx, the red LED flashes four times and then blinks every few seconds. One short blink denotes the battery cells are pretty close to being balanced. If it blinks 2, 3, or 4 times, it is indicating that either cell is charged higher than the other. It then will start discharging the higher voltage cell until it is approximately the same voltage as the other cell. This may take a while, so plan on balancing cells at home when the cells have enough time be balanced correctly.

We don’t have to wait for the balance to be completed to start charging our battery. However if we charge at a high rate, the DapterRx cannot keep up with any major imbalance and will just charge away until the total battery voltage gets to 7.4 volts, balanced or not. It will then terminate the charging phase and indicate the balance state of the 2 cells. As with all the other Dapter units, the maximum charge rate is limited by both the available output current of the battery charger and more importantly,

the size of the charge leads going to your battery. Standard battery leads provided with the DapterRx are Okay for up to 3 amps of charge current, but I would try to limit this to a lower value, say 1.5 amps. The charger used with the DapterRx has to be one that has a manually set charge current. So-called “smart chargers” that decide on their own what current is set cannot be used. I use my 12 volt Hobbico Fast Field Charger, seen connected to the DapterRx in photo 8.



The DapterRx has no buttons or other input devices to press or turn. You hook up the unit to your battery, look for the indication that it is connected correctly and start charging or balancing. It will indicate a successful charge cycle when the green LED is illuminated. That was easy, wasn’t it?

The DapterRx sells for \$25.00 including shipping to the continental US and is available from SLK Electronics, 06 Charolais Drive, Greensboro, NC 27406; or from their web site at www.slkelectronics.com. It combines ease of use, balance charging and error detection in one small package.

COVERING ALL YOUR BASES

This will be the first in a series of two articles on applying fabric covering to balsa structures and then applying a finish to the covering. While there are many other perfectly acceptable methods of completing these processes; this is the way I do it. I have built several true “kit” airplanes over the last few years and most have been covered using commercially available fabric materials. Several popular brands are still available including SolarTex, WorldTex and ColorTex (which are all the same stuff, made in the same factory in Europe). This time, however, I am covering a large WWI biplane with an old friend, SIG Koverall. It is a light weight polyester based fabric that shrinks tight with heat. It

comes in several sizes, each of which is 48" wide. I purchased 3 packages of the 5 yard long material, so you can estimate just how large the plane is.

Koverall has no adhesive, and must be applied using some sort of heat activated product around the edges. Keeping within the SIG lineup, I used Stix-It. Stix-It is a liquid adhesive, that is also heat activated, that holds the edges of the Koverall in place until more finishing materials can be applied. Photo 9 shows some of the materials you will need to apply Koverall. The lacquer thinner is used to clean the brushes used when applying the Stix-It.



Since the Koverall, balsa structure, and my work table area are basically off-white in color, there is no way I can show you any meaningful photographs of Koverall being applied. I can describe how it is done, what things to look out for and what you have to do after the Koverall is in place. There's a bit more work that just plopping down some plastic film, ironing it down and being done. It will take a bit of additional time due to the drying time for several of the required finishing materials, but by the time you do the same steps to all your airplane parts, it's time to start over on the first one.

The first step, as with any other kit built plane, is to sand the structure as well as you can. If it looks good enough, you're not done. Sand it again. Then brush, blow or otherwise remove all the sanding dust from the surfaces and the deep crevices that dust seems to settle into. Stix-It has a pretty strong odor and if you have a place outside the house or workshop, take your parts out there and start brushing on a coat of Stix-It to one side only of each part. *(Note- Make sure to use protection for your*

hands and lungs, even though it can only kill you once!) You only have to apply Stix-It to the perimeter of the part you are covering. You don't have to apply it to the ribs, formers or other pieces within the outside perimeter. You'll see why later. Make sure you apply the Stix-It to the rounded parts of the surfaces, but not on the opposite flat surfaces.

You'll be applying covering to just one side at a time, starting with the bottoms. Let the Stix-It dry which may take all of 15 minutes and then apply a second coat, making sure there are no runs or drips. Let this dry about 15 more minutes and run your fingers across the edges. If it is dry to the touch, you're ready to cut out your covering material.

Koverall is best cut using a straight edge and a new single edge razor blade. Cut each piece of fabric oversized by about 2 inches on all sides to give yourself a piece of material to hold onto while applying it to the structure. You'll find that the new razor blade becomes old really fast, so it's best to use a new one after maybe a dozen cuts.

It's time to apply the first piece of Koverall to the structure. Drape it over the part and pull it so it lies flat. Set your covering iron to about 225 degrees F and tack one corner of the Koverall in place with a firm pressure. Go on to the next corner and do the same thing. Pull the opposite end tight and press that down also making sure the iron's heat has activated the Stix-It enough to hold the Koverall in place. Working around the perimeter, tack all the Koverall to the surface. You can gently pull on the material to see if it's held tight enough. If not, use the iron again and heat the material until it sticks.

The edges are next and in most cases the edges need to be shrunk using the iron set a little hotter, maybe 250 degrees F. Roll the iron around a rounded edge, pulling down on the Koverall as you go. Since you only applied Stix-It to the top and the rounded parts, which are all you can get to stick. The Koverall shrinks well around curved surfaces, but be sure that it is stuck down really well.

Using another new single edge razor blade (plan on a box of 100 blades for 2 to 3 projects) trim the Koverall at the point where the covering is not secured to the structure. When it starts to tear the Koverall, stop immediately and use a new blade. Koverall cuts easily with new blades, but starts to shred with an old dull blade. Use your iron to smooth the Koverall around the corners, and if you find a section that didn't seem to get enough Stix-It,

don't worry because you'll be adding more really soon.

You may have a few wrinkles in the Koverall you just applied (I did this on purpose as a visual aid.) as seen in photo 10, but don't be tempted to shrink them out right now. And please don't use your heat gun to do any shrinking of the Koverall. The material can shrink up to 12% of its original size which is enough to warp or even snap a balsa structure if heated too much. The iron will be all you need.



You may have some Stix-It on the sole of your iron and here's an easy way to take it off. Get yourself some dryer sheets, the ones that make your clothes really nice smelling after they come from the dryer. Put the sheet on the workbench surface and rub the iron over it. The Stix-It residue will disappear almost instantly. This also works for plastic film and fabric covering adhesive residue also.

You now will apply more Stix-It to the opposite side perimeter and around the edges as you did previously, but try to keep it from getting on the opposite side flat material. Just put it on the uncovered flat parts and the rounded edges. Let it dry, apply a second coat and let that dry too. The Koverall can be applied in the same manner as the first side, trimming and ironing where necessary.

Now we can do some shrinking, but go really easy. Turn your iron up to maybe 300 degrees at most and see if you can find any wrinkles or loose places in the surface of the Koverall. Stay away from the edges if possible because you may loosen the Stix-It. You will see the Koverall start to work its way tighter across the surface (Photo 11) and now you know why we didn't put Stix-It on the ribs or other parts in the middle of the structures. It shrinks easily but make sure to do a little on one side and

then do the same amount on the other side to prevent warping the structure. You will also hear some creaks and groans from the Koverall as it shrinks, so don't become alarmed. A little more shrinking and we're ready to apply some basic finish materials. Photo12 shows what a few parts for my biplane looked like after applying the Koverall.



We now have to apply something to the fabric that will hold it to the underlying structure. SIG recommends the use of good old model airplane dope which will work well if you have the right workshop and plenty of fresh air. I did some research and found that my favorite sealer can be used just as well and it doesn't have much of an odor, it dries in a few minutes and the brushes can be cleaned up with water. That's where the Water Based PolyUrethane (WBPU) comes into play. After the Koverall is tight and there are no more wrinkles, a light coating of WBPU is brushed on one side of the part you're working with and allowed to dry. You must remember that WBPU is rather thin and will not only fill the weave of the Koverall it will also drip through it and come to rest on the inside of the other side. I found the best way to prevent this is to apply the WBPU to the surface upside down. It's difficult to do this, especially with large parts like the wings, but it prevents drips and puddles inside the parts.

Once the first coat is dry, a second coat is applied, but since the weave is fully sealed, the WBPU can be applied in the traditional manner, right side up. With the second coat dry, it can be very lightly sanded and any threads or rough edges can be removed prior to applying the final finish. In my case, the full scale plane had a finish that showed no fabric weave at all so there had to be more filler applied to totally fill the weave. I mixed some

WBPU with some baby powder to make a mixture that had the consistency of buttermilk. Several coats were painted on and allowed to dry and once lightly sanded, there was no weave showing. After a light coat of primer, the final finish could be applied. Here's one of my parts after covering, sealing and painting. (Photo 13)



I did a little experiment with WBPU and no Stix-It to apply Koverall. I had heard that it would work but was unsure, so I tried that technique on the bottom hatch on the fuselage. If it failed it would be easy to go back to the original method.

Several coats of WBPU were brushed onto the plywood allowing each coat to dry (about 2 hours). I set my covering iron to about 250 degrees and proceeded to iron the Koverall down onto the plywood. It stuck quite well, not as well as Stix-it. After several more coats of straight WBPU were brushed on, it was stuck down well. It seems that the heat of the iron reactivated the WBPU, which acts like glue to hold the covering in place.

Next, several more coats of the filler WBPU (mixed with baby powder) were brushed on and allowed to dry. This was sanded and another coat of straight WBPU was applied. After a very light sanding, the part was ready to prime and paint.

Keep in mind that the WBPU is mostly water, meaning that it will soak into balsa very easily. Have you ever seen waterlogged balsa? It is very warped and lumpy. You'll have to apply several coats of a non-water based sanding sealer before brushing on the WBPU. Maybe the Stix-It worked well enough in the first place. In any event, the experiment worked out.

When it comes to final finishes, there are literally dozens of paints that can be used over the WBPU and I'll leave the choice to you. If you like dope, use it. Water base paints? That's your choice. Spray cans? Have at it. Use whatever works best for you. In the mean time, I'll get back to covering

my fuselage and getting ready to apply some paint to everything.

SOME GUYS HAVE ALL THE LUCK

My buddy Rick Cawley took his Royal F4U-5 Corsair up to Dayton, Ohio, for the 2009 DOGS Fly In a while back. At the flight line, a fellow came up asking about the Corsair and asked Rick if he would like to take a look at his Corsair. Rick started walking down the flight line and the fellow said that his Corsair was at a local airport and invited Rick and his wife Gail to come over the following day for some photos.



Rick and his Corsair in front of the other fellows Corsair at the airport. It is an F4U-5 model also, but is painted in a similar paint scheme.



Rick got even luckier when he was invited to climb up into the cockpit!

That's about all I have for this month. I hope you enjoy a very nice holiday season and that all your wishes will come true. That sounds like a Disney movie, doesn't it?

See y'all at the field....

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The Oily Hand

by Brian Winch

BEFORE WE GET STARTED...

...I always welcome contact with readers either by email or postage mail. I will reply to emails as soon as possible, (I do have other jobs, as well, at times.) but I cannot provide postage replies unless your request is accompanied by an International Response coupon (available from the Post Office). It costs me to print and supply paper (and maintain a printer) for a reply which is no big deal, but postage is another story. A standard airmail letter from Oz is now \$2.50 and a few of those bite into my (deep pockets) pocket money which is a bit meager on an old fart's pension. Thank you for your understanding.

THE MYSTERY CARBURETOR

Well, not really a mystery, but it can be perplexing if you are not familiar with its workings. The carby to which I allude is the diaphragm pump, fuel regulated carburetor fitted to the petrol engines we use for model power. The most common is the Walbro and then there is a sprinkling of Tillotson, a rare Delorto and the odd special that is peculiar to a particular hand tool engine. New on the scene is the Saito pumper carby for the Saito petrol engines and there are two types of these: the one used (so far) for the 36cc Saito and the 20 and 14cc engines which is a pump/regulator supplying a common style Saito carby. The most usual calls I receive from modelers when asking for help with these types of carbies is regarding the tuning - that they won't draw petrol, the petrol runs back when the engine is stopped or they just don't work when the model is flying. Well, I suppose that is enough to make your day so let's look into these aspects of pump type carburetor operation after we have ruled out other problems as the possible cause. I am going in a bit deeper than I did last month with some more ignition problem topics.

Other than mechanical - which would be evident - the only other consideration, as to engine operation, is the ignition system.

Okay, you're not happy about 'evident mechanical problems' as I just mentioned. Well, if the engine has lost compression suddenly, (or over a long period), parts of the engine have come loose, you have fitted a home made muffler that is not really well designed,

the spark plug is loose, 'something' inside the engine



has broken or come loose and damaged other bits, you can say that you have an 'evident mechanical problem.' (Photo 1) .

Happy now? Right, the ignition system and here we also have 'evident problems', but your thinking is clouded by the frustration of the engine not starting or running correctly. Absolutely the first check is the battery, and I am not at all convinced when you say it is okay and you just charged it. The recommended battery power is from 4.8 Volts to (now) anything up to 18 Volts but, more commonly, 6 Volts. I'm here to tell you that a 4.8 volt pack is



Photo 1 A very common example of 'evident mechanical problems' I see very often on my work bench. If the rod is broken the engine ceases to operate

scraping the barrel unless it is of absolute first class condition, plenty of amps capacity and really well charged. So many times I have modelers call me with petrol engine problems and, working on the description of the problem; I deduce that their

battery is not up to the job. Just this week I had a modeler call me from as far away on the west coast of Oz as he could be (I live very close to the east coast) and, for readers not familiar with the size of Oz, about the same as him ringing me from Oakland in LA and me in Boston, Massachusetts. From him to me it is 2,957 miles and the equivalent for you is 3044 miles. I told him I thought it was a battery problem, but he was not convinced so he ran the engine for me to hear (expensive phone call). I just sat by the phone and listened for quite a while obviously not saying anything as all I could hear was the engine spluttering. Later on, Shirley, (dear wife) commented that the caller must have talked a bit as I had not said anything for quite a long time. When I told her I was listening to an engine running she decided it was time she went outside and discussed quantum theory with one of the cats or applied electron magnetic science with the parakeet. Why should I have all the fun? Anyway, after quite a few phone calls (and engine running) over 3 days, I finally convinced the caller to try a new battery pack. His last call (and engine run demo) was all sweet and rosy. The engine was running perfectly and it sounded spot on, as best as I could determine on the phone from almost three thousand miles away. Next consideration is the spark plug, and here we have a little problem. Firstly the consideration is the gap and the recommendation is to have the gap at the maximum opening as advised in the engine or ignition instructions. You can simply check the spark plug by removing it and spinning the engine (with ignition on) keeping in mind that it must be earthed, generally by the outer braid of the high tension lead, or a separate wire attached to the engine. In which case, ensure the body of the plug is firmly in contact with the engine. Failure to provide an adequate earth connection can destroy a CDI unit. The problem, as mentioned, is that while the plug might spark outside the engine, it might fail inside when acted upon by the build up of cylinder pressure - pressure normal to the operation of the engine. Failing a pressurized plug tester unit, the simplest method is to use another new plug or try the plug in another engine that is known to run.

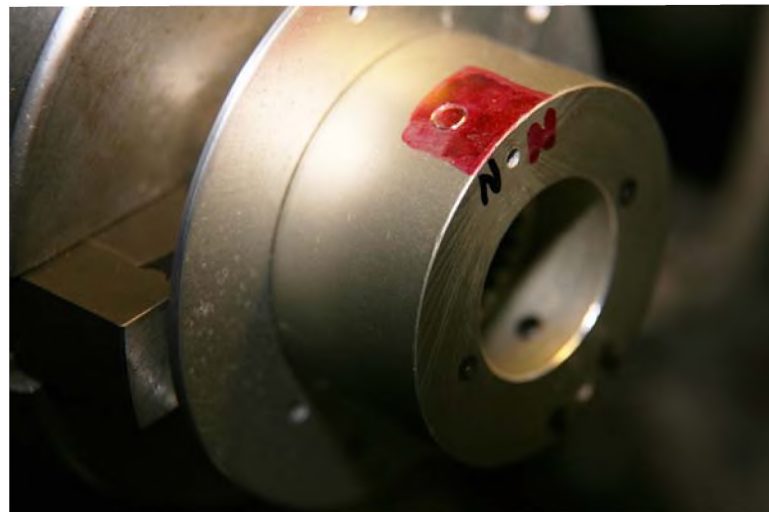


Photo 2-The bobbin is about 3" diameter with the opposite pole magnets opposite each other. The large disc at the rear is to stop knuckle grazing on the chuck jaws while I am holding the sensor over the rotating magnets

The Rcexl ignition plug tester I showed you last month is a great help. When simply set up it generates a spark at the plug and is adjustable to 20,000 RPM. You are on a reasonably good bet that the plug is okay if it sparks cleanly between the earth (of the plug) and the center electrode. A good plug shows an almost constant clean spark at 20,000 RPM. This test also indicates that the CDI unit is probably okay as well. The only 'if' in this test is the same as the plug under cylinder pressure. If the CDI is weak or breaking down, it will not be able to overcome the internal resistance that occurs when the cylinder pressure is at its peak. An example of this would be a pressure reading of 100 to 130 psi. The magnet is a simple job - the tip of a screwdriver (typical example) soon indicates if the magnetism is still hanging around; so we are now left with the Hall Effect sensor or, in the case of Saito engines, for example, the magnetic induction sensor. The simple test for the sensor is, if all other parts are okay, to rotate the engine with the sensor passing over the magnet. If the plug sparks, it is a fair bet the sensor is okay. With a magnetic induction pickup you will have to spin the engine with a starter as they won't send a signal under 250 to 500 RPM. Owing to the fact that I carry out a lot of testing, I set up a simple bobbin to spin in the lathe for the purpose, mainly, of testing magnetic induction sensors. It will test any type of sensor as a bonus. **(Photo 2)** I have two magnets flush with the surface; one with the north pole and one with the south pole exposed so I can test any sensor regardless of their polarity sensitivity. Some work only on one pole - north or south.

The first hint of an ignition problem is when the engine will fire readily, but you cannot advance the throttle. As the engine RPM starts to increase, the cylinder pressure builds up and the spark loses interest. Don't jump to conclusions too hastily though. You can get the same effect with faulty reed valves if the engine has that type of induction. By faulty I do not mean human interference, I mean faults as 'the poker' as discussed last month.

ON ANOTHER TACK

Very generally speaking, two examples of common induction styles in many of the larger capacity petrol engines are piston port and reed valve. With piston port induction, the piston acts as the valve as it passes the open port. Nothing much goes wrong with these and they don't require interference. **(Photo 3)** Reed valves are generally a forgotten area, but the occasional problem does creep in and it is usually due to a bit of heavy handed work by the assembler of the engine (or the owner, if he has been farting about where farting was not needed). If the securing screws that hold the valve(s) are wound down too tight the corners of the reed can break, the plastic frame can distort or the metal strip sometimes used can actually partially sever the top of the reed. Reed

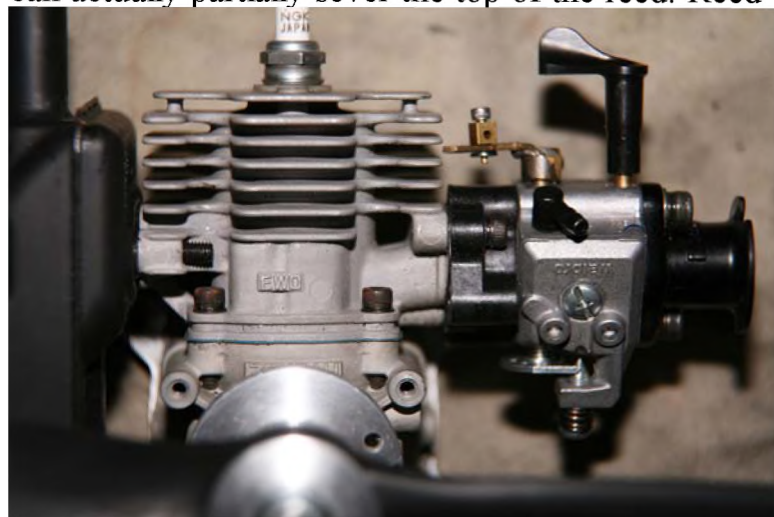


Photo 3-An example of a piston port engine. Reliable but they do tend to spread out a bit.

valves are correct in one way only: they lay flat - dead flat all over - on the base frame support. Any curl, lift or other gap is a non-event as the reeds won't be able to do their job which is, open when the piston goes up and close (tightly) when the piston comes down. The principle behind the operation is to do with atmospheric pressure and a bit of suck by the piston. With the piston at the bottom of its travel - BDC (Bottom Dead Center) - the only space

available in the lower end of the crankcase and cylinder is in the crankcase itself and up under (inside) the piston. To obtain the best Volumetric Efficiency - pumping effect - this space is kept to a minimum. The higher the quality of the engine, the less space there is in the crankcase as a lot of design and machining is needed to produce a high grade crankcase volume. **(Photo 4)** As a nostalgic aside, in my very early days of competitive motorcycle racing (and 'hotting up'), a small two stroke cycle was a good start as they were common and did not cost an arm and a leg. The UK company, Birmingham Small Arms (BSA) produced thousands or more of a very popular lightweight machine (as we called them) under the log of The BSA Bantam.



Photo 4-Intensive CNC work inside a quality crankcase so the parts that fit in are virtually shoe horned in to fit.

An incredibly reliable motorcycle, great to ride, very stable and good performance for a 125 cc (7.625 cu in) engine, which is the same as several model engines we use these days. To make them sit up and boogie, we would fit a larger carby (second hand from a bike wrecker), fit a different head (foreign order at work when the boss wasn't around) and Scotch rivet a sheet of 16 gauge aluminum on each side of the counterweight to the inner surfaces of the crankcase. Scotch riveting is done by punching around the edge of metal with a prick or center punch to mechanically weld the two metals together. I punched the compression up so far on one of my engines that I could run it on methanol (and oil) and it went like a scalded cat. I had to lower the compression a bit if I wanted to race it, as petrol was the only fuel allowed and it works better at a lower compression. The main point of my trip back was the packing of the crankcases which were cast with a minimum of machining for cost purposes. In our

better quality two stroke engines, available now, the inner case is CNC machined so that there is hardly a whisker of free space and that is to improve the Volumetric Efficiency. Obviously, I have given a very brief overview, for interest's sake. We are not designing high performance engines here.

Okay, back to the mainframe topic. (You all like that ultra modern terminology... 'mainframe'? No rubbish terms here, mate!) Yeah, okay, get on with it...

As the piston moves on its upward travel, it creates a void behind it (a weak vacuum); and lurking ever outside like a blowfly sniffing for a snack at a picnic, is our good friend, atmospheric pressure with its 14.696 psi force (at sea level) backing it up. Quick as a 'bite' from an under-propped engine, it races in to fill the vacant space (the void) and, in its pushy forward move, it flings the 'doors' (the reed valves) open; and rushes in like an angry crowd surging into an elevator during a red hot sale at a department store. Mind you, the piston is not all innocent here as it creates a bit of suction itself, and this tends to act on the opening of the reeds also. Lurking, almost forgotten, in the directed path of the force of atmospheric pressure, is a fuel jet waiting to hitch a ride up the engine void area. As 'the force' rushes in (and the piston does its bit of sucking up), the fuel jet opens its flood gates (so to speak) and lets fly a measured dose of fuel to mix, inconspicuously, with the inrush of air. When the piston reaches the end of its upward travel and the void is completely filled with a wet, fuel gas vapor, (The piston skirt even closes off the exhaust port...in most cases.), the next event depends on the closing of the reed valves. One little buckle or bend, a bit of grit, a dog (or any other) hair and things are not going to go well. All that air, fuel (gas) that has been stacked in is now going to be squeezed by the piston. Not happy with being up so high, it wants to come back down as quickly as possible and get rid of the 'squatter' tenant that took up the vacant possession. All things being as they should be, the 'tenant' cannot escape out the doorway through which it entered. The one way doors (reeds) are now well and truly closed, and the more pressure that is applied; the tighter the door seal becomes. Okay, here comes the piston. The doors are closed, so let's quickly duck up these side alleys that are now being exposed, and we can sit on top of the piston. The side alleys (fuel passages) are always open at the bottom, but closed at the top by the piston. As the piston descends, the top doors are

opened and the piston forces the tenant below to go upstairs, so to speak. To add to the story, what the poor tenant does not know is that when it gets on top of the piston, it will soon be under even more pressure as the piston comes back up again trying to decide if the top position really is better than the bottom position. As the piston comes back up, a little of the gas being compressed will escape out the exhaust port (It's the nature of the two stroke beast.). For the brief part of a second that the exhaust port is open then it's time for the really big squeeze (compression). Lurking somewhere below is a little electronic bit that gets really excited as news is passed onto it by the passing magnet, and it cannot keep all the news of the big squeeze to itself! It has to tell someone and that someone is the CDI (Capacitor Discharge Ignition) unit who, then, passes the story on to the spark plug. The plug is so excited it throws a tizzy fit, a spark across its gap. This sets off the now compressed gas for a monster party explosion. Well now, that's a nice little horror story that just might not have such a great ending if the (now almost forgotten) reed valves are not up to the job. If they are not feeling well...err...sealing well, the fuel gas under compression with now more force than atmospheric pressure, will escape back through the faulty closure of the reeds and all will not be well. The engine will display a faulty running, if indeed it does run at all, and fuel will dribble back out of the carburetor. Unknowing pit experts will carry on about faulty carby valves, leaking diaphragms, needle and seat needing adjustment, the brand of carby/engine/propeller/whatever is no good and prone to that sort of trouble. In some cases you can feel a slight blowing out if you put your hand adjacent to the air intake of the carby and have somebody else spin the prop (ignition off, battery disconnected for absolute safety), but it might be hard as the engine flops about during the prop movement. If I saw petrol seeping back out the carby, and I knew the carby was in perfect order, I would strongly suspect the reed valves of having a problem that could be checked by simply undoing the two carby retaining bolts. Well, I think we have covered just about all 'other than carby' problems, but the end of the last page is nigh; so I'll leave the carby stuff for next month and finish off with a little snippet and then the latest doings of the brain dead fool.

MAGNETS... AGAIN

In last month's column, I spoke again about using a magnet in a plastic bag for picking ferrous (iron/steel) bits up from the ground or floor with particular attention to shaft keys from model engines that drop in the grass at the flying field. Gordon is not convinced it works, and I first thought it might be due to the small size of his...err...magnet. Then I thought, being a mean git, he is probably pulling the little magnetic pad off the back of fridge stickers. You know the type: plumbers, electricians, real estate agents 'reminders' dropped in your mail box that you then you stick on the fridge in case you ever need one of those services (if ever you are rich enough to afford them). Finally, I realized his problem. He has been using a magnet with two North poles, and these are totally useless for attracting ferrous items. The only things a double north magnet (or a double south - if you can get one) attracts are rocking horse manure and hen's teeth and Gordon is about the only person I have known lately with a need for both of these items. The magnet I use is a neodymium type in the form of a flat donut similar to the ones you get off the back of sound speakers, but much stronger. I scavenged mine from a microwave oven and it is so strong I can pull 3" nails from a 2 x 4 wood plank. Well, the nails aren't nailed in flush with the surface. Yeah, okay, maybe a bit of a tall story but I can stop Shirley's VW from rolling down the drive if I put it on the bumper bar. **(Photo 5 & 6)**

LARD BRAIN'S EXPERIMENTS

Well, here's the tail end and it is the never ending saga of cotton candy brain and his pursuit of flight without the comfort of a regular aircraft. He was at a party recently and some fun character put a 'Whoopee Cushion' on a chair just as a whining middle aged female (You get 'em at all the parties. Don't know why they come if they are upset by the goings on.) was about to plonk her nether regions on what she thought was a cushion. Well, the old Whoopee Cushion gave a great blast and the female rose up a lot quicker than she had been doing for many years. She was full of vitriol and venom, and demanded to know who had perpetrated this vile insult on her. Jughead (stupid assistant) was not a party to the fun, but his attention was caught by the action of the cushion when the female jumped up.



Photo 5- Phew! If I hadn't had my 'Magic Magnet' on hand we might have lost the poor old Vee dub.

Something had caught in the sound reed, like our reed valves above, and it didn't stop as they usually do when the weight is off them. This one kept 'braaacking', and the escaping air out of the nozzle caused it to fly around the room. The light turned on (in his feeble brain) and a seed of an idea was born. Wind power was the answer: wind forced out an aperture of a Whoopee Cushion large enough to support a person. Two days later he was in the yard



Photo 6-About 4" diameter and strong enough to pull the key from somebody else's engine if you lose yours

with a double bed air mattress which he had pumped up to about four times its normal size. It was rocking and rolling in the wind and ready to go once the restraining cord was released. He had sewn on a large set of rubber flapping wings on each side and, to liven up the picture; he had a mocked up chicken head attached to the front. It looked a bit like a prehistoric chicken with a huge misshapen body. Out the rear was a large nozzle and he even had a few large feathers attached to this, his Whoopee Chicken that would fly him to Nirvana. A dog from down the road was giving the 'chicken' a quizzical look when

bird brain strapped himself down on it, released the restraint cord and pulled the cord attached to the plug in the rear nozzle. Let me tell you here and now, you have never heard a Bronx Cheer like the one that came from that mattress. It was like what you would hear from an elephant that had eaten a bushel of baked beans in one sitting and finished off with fifty or so cabbages. It was like that, but louder and more razzy. The dog jumped about 6 feet in the air with fright then broke into a loud baying bark as it chased the now moving mattress down the street. The blast got louder and the mattress gained altitude as it headed for the farmland area over the hills in back of my place. The sound of the 'cheer' and the baying of the dog attracted more and more dogs, and as I saw the Whoopee Chicken getting smaller in the distance; I reckon there was about 50 barking and baying dogs in pursuit. Sooner or later that mattress is going to run out of air and return to the ground from whence it arose and that pack of howling dogs is going to catch up and want a piece of that weird chicken. I figure that foam brain will get himself loose of the mattress and take off into the hill area, but the dogs will then chase him. With a bit of luck, I won't see him around for a while, at least until he out runs the dogs or.....

While he is enjoying himself, let's slip into something comfortable in the realms of....

APRILWUN -DOT ROT - DOT CON

In this section we are exploring the weird world of strange people and the odd things they say or write. These are 'signs of the times' I have noted at times that have been written and installed by 'people in authority' to guide us, warn us or... simply confuse us.

*Covering engine topics and working with metal for models.
Send your comments or questions to:*



oilyhand@bigpond.net.au

Brian Winch

33 Hillview Pde, Lurnea

NSW 2170, Australia.

International Response Coupon (available at the Post Office) required if you want a written reply.

RCReport Online Test Report!



E-flite P-40 300 Warhark ARF

Model.....E-flite P-40 Warhawk 300 ARF

Airplane Type.....Scale foamy

Manufacturer.....E-flite

Distributor.....Horizon Hobby, Inc.

4105 Fieldstone Rd.

Champaign, Il 61822

1-877-504-0233

Typical Price.....\$129.99

Sale Price.....\$99.99

Wing Span.....Advertised: 25.6"

Measured: 25.625"

Wing Area Advertised.....108 sq. in

Measured.....116 sq. in

Airfoil.....Semi-Symmetrical

Wing Type.....Molded Foam

Wing Joiner.....N/A 1 piece wing

Fuselage Length.....Advertised: 21.7"

Measured: 21.625"

Pushrod type.....Micro wire

Hinges included.....yes

Hinges Installed.....yes

Rec. Controls.....3 (Ail, El, Throttle)

Engine Mount Installed.....yes

Rec. Engine... ..Include

300 Brushless

Landing Gear Installed.....no

Wheels Included.....Not required

Advertised Weight.....6.5-7oz

Hardware:.....Metric

Hardware Included:.....2-Spinners, 2-prop, 3-O-rings, O-ring attachment tool

Items needed to complete...10 Amp Brushless Speed controller, Battery 2 cell LiPo 20C 430mAh, 2- 6 gram micro servos, battery charger, 3 channel radio system

Covering Material.....Painted foam

Fuel Proofing required.....no

Estimated Assembly Time.....3 hours

Estimated Skills required.....Novice

Drilling required... Yes....Servo arms

Assembly Tools required..... Hobby Knife, #0 Philips screw driver

Adhesives required...Foam Safe CA, Foam safe Kicker, canopy glue

Completed Model Specifications

Finished Weight.....6.7oz

Wing Loading..... 8.2 oz/sq.ft.

Motor Used.....Included 300 Brushless

Propeller Used...as supplied 7.25 in unknown pitch

Main Battery used...E-flite 2-Cell 7.4V 20C 430mAh LiPo

Speed Controller....Castle Creations Phoenix 10 Brushless ESC w/BEC

Radio used..... Futaba 12FG Transmitter, Futaba R6004FF 2.4GHz, 2-E-flite 6.0-Gram Super Sub-Micro S60 Servo

Cheers-Very nice scheme with molded in panel lines and rivets. Preinstalled control horns, motor and torque rods make for speedy build.

Jeers- suggested throws in instructions are backwards in reference to English measurement of aileron throw, no rudder

E-flite has brought us another addition to the WWII scale foam aircraft. The E-flite P-40 Warhawk 300 ARF is a small lightweight park flyer with a great paint job and very few parts. Let's get a look at what's in the box.

The wing is a single piece wing that has the ailerons cut out and hinged already. A single servo in the wing drives the torque rods with preinstalled pushrods. There are many molded in panel lines, painted sections and scale features that give this Warhawk wing a great look! The fuselage is decked out with the same amount of detail as the wing and then some. The brushless 300 size motor is preinstalled along with the propeller and spinner. The wires for the motor are extended back through the nose of the fuselage and into the belly section for ease of access. Moving back to the tail we see that the tail is actually there already. The vertical and horizontal fins are already set into the fuselage for me and the elevator is pre-hinged like the ailerons were. The pushrod for the elevator is installed and connected to the control horn on the elevator and the opposite end of the rod is resting next to the hole for our servo. Sadly, we don't have any allocations for a movable rudder, but if someone wanted to; it could be done with a bit of effort.

Now we can get into the manual and get started building, although I don't think it will take more than about two to three cups of coffee! First thing we do is take stock of the parts we are given, but again there are not very many. Not counting the fuselage, we have one additional propeller and spinner, one additional replacement o-ring to hold the wing to the fuselage, and a set of bullet connectors for our 10 amp brushless ESC to match those already on our motor wires. That's it! Except for a cute little desk stand to display the P-40 for those executive types!

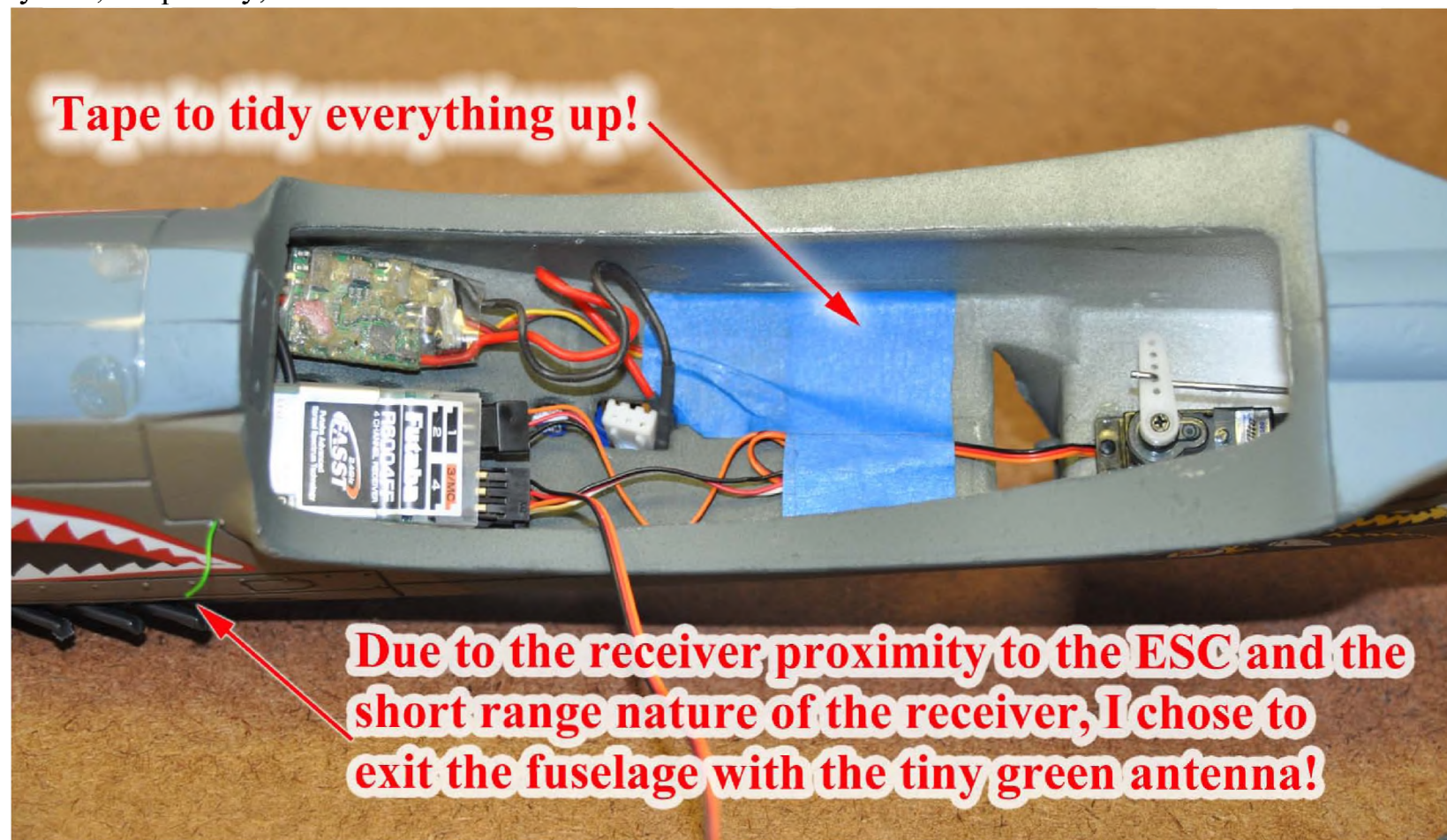
Okay, the first step is to glue our servo into the wing in the hole provided. Now, in my case the glue was probably optional because I had to take an Emory board to open up the width of the servo hole a little. I also had to make a small relief cut in the foam for the servo lead as illustrated in the instructions. The servo fits so tight that I think if you tried to pull it out, you would probably break the servo. I used the recommended E-flite S-60 servo that is illustrated in the manual. I added a few drops of Bob Smith medium CA to the tab of the servo and immediately hit the servo with CA accelerator from Bob Smith as well. Now I didn't use foam safe CA



here, but I recommend you use it if you have it. I only used a very small drop on each tab and worked quickly, so no melting of the foam was done!

Next we are instructed to install the servo for the elevator in the fuselage. The same extremely tight fit here and few drops of CA and I move on to readying the servo arms for attachment. I had to open up the holes in the servo arms to accept the pushrods, but the manual covers this very well and with nearly as many pictures as words. Now that the arms are ready we need to put in our ESC and radio system, temporarily, to set our servos to their neutral

point. Then we can screw on our arms. Now this is a small plane, so I know how cramped it can be with the equipment, but we are instructed to stick our receiver down right next to our brushless ESC. I mean we are talking mere millimeters separating the ESC and the receiver each other, so using a 2.4 GHz system is a must. I am using an ultra small 4 channel R6004FF from Futaba. I'll be piloting with a Futaba 12FG radio system. Both the receiver and the ESC are stuck to the fuselage with double stick tape per the instructions. I think that hook and loop fastener would be a bit better, but I'm just following instructions. When the wing is on, the close quarters will not allow for much movement anyway. One additional thing I did was to add a piece of masking tape to hold the elevator servo and ESC wires down to the fuselage. This tape keeps things more tidy and keeps the wires out of the way of the linkage for the ailerons. I centered the arms on the elevator and the ailerons and fastened the servo arms down to the servo. Now because our motor, prop and spinner are preinstalled we need to take extra care because when we power up the system the motor will arm. In my case, the throttle and elevator channels had to be reversed to get things to work correctly.



Now that we are finished in the belly of the fuselage, I turn the plane over to attach the wing. The wing is held on in front with two small plastic pins that fit into the fuselage, but the rear is connected via an o-ring that hooks to the wing. The o-ring is then fished up through an opening in the fuselage and attached to a hook under the canopy of the fuselage. E-flite has provided us with a device designed specifically for this job. It's simple, but very effective; and you shouldn't need it very often because the battery access is from the canopy!



The battery I am using is the 430mAh 2S 7.4V 20C LiPo, 20AWG JST by E-flite. It weighs only one ounce and fits the provided area very well. I don't need any tape or hook and loop here; it is another very secure fit.



One problem here is that we don't have a great deal of room in the canopy area due to the plastic cockpit interior piece. This means that we need to tuck our wires in carefully to make sure it

doesn't interfere with the magnets and allow the canopy to fall off.



Now we have our completed model ready for a test flight, but for now I'll just let it sit on the desk stand overnight. Tomorrow we will test fly; weather permitting!

FLIGHT DAY

Well on a cool day in November, I grabbed my daughter Cassie and of to the field we went. We waited until midday to allow the sun to get behind the zero line of our field. Cassie manned my Nikon D90 and I tossed the P-40 into the sky. The brushless 300 motor provides plenty of power and speed. The first flight lasted six minutes and loops rolls are easy, but I miss a rudder. The P-40 will get a little snappy on high rate elevator, so just stick with low rates until you are comfortable. We had about 3mph winds. The P-40 handles well in the wind, but gets a little bumpy on landings due to the thermal and gusty activity. Grass landings are a must.

The E-flite P-40 is fun to fly, very affordable and a good Christmas gift for any RC modeler.

Tony Coberly

Tonyc@rcreport.net

2.4GHz legal issues...

Over the past few months, several brands of RC equipment have come across my repair desk that are illegal for us to use in the USA. Yes, ILLEGAL. You see, the FCC REQUIRES that all equipment that puts out a signal (RF) be certified and approved by them. Actually, the equipment is tested by a third-party company, and then the results are sent to the FCC and approved if the equipment meets current requirements.

Here's what's happening. With the ease of purchasing inexpensive equipment from Asia, many modelers have found sources for 2.4GHz spread spectrum equipment that will work as either a stand-alone system including transmitter and receiver, or a module-type system including a receiver to convert your existing transmitter to spread spectrum.

From a frequency standpoint, this in itself is not a problem, UNLESS the equipment that is being purchased does not have an FCC ID number somewhere on the module and/or transmitter. Not only does the equipment have to meet FCC guidelines, it must also display the FCC ID number on it somewhere. There are also cases where a USA importer brought in some spread spectrum equipment from overseas and did not get it FCC approved and properly stickered prior to selling it in the USA market. The FCC has pounced on them and fines have been levied.

The issue here is that the modeling public needs to be made aware of these problems so that this type of equipment is not purchased or allowed to be used at our AMA flying sites. If you are looking into purchasing some of this kind of gear outside the USA; make sure that it has an FCC ID number on the unit prior to purchase. If the company cannot provide you with proof; don't buy it! *(Editor's note: We must always remember that we as modelers that are using the radio gear are ultimately responsible for it. If a manufacture does not get FCC approval, it may be that the radio gear is simply not within specifications. This could crash your plane, but what about others?)*



Having the equipment approved by the FCC is a Federal requirement, not an AMA one. If the FCC allowed any equipment into the USA, sooner or later we would have some poor-quality gear that could cause your model to crash; and may also interfere with someone else, leading to a crash an/or injury. Equipment that has been tested, verified and carries the proper FCC ID number means that the company has taken the required steps to have their equipment tested to make sure it does what it was designed to do and also not to interfere with anyone else's equipment. The cost for this test is not cheap. Depending on the testing facility, it can be from \$10K to \$20K. This is a pretty stiff investment for the manufacturer, especially when you consider that every different model of transmitter must have its own specific number!

AMA wants every modeler to do is be aware of this problem and start looking for FCC ID numbers on your module/transmitter. If you see someone at the field that has some new gear, ask them about it and check to see if it has the FCC ID. Talk about this issue at club meetings and at fun-flies. The more that everyone knows about it, the less the chance someone will spend their hard-earned cash on illegal equipment.

The FCC has a website that will allow you to look up approved gear by manufacturer. It is a little cumbersome to use, but it does work. The link is: <https://fialfoss.fcc.gov/oetcf/eas/reports/GenericSearch.cfm>



Photo 1 Futaba 6 EXA radio back



Photo 2 Futaba 14M Z module FCC ID

Remember, however, that even if the equipment is listed on the site, it still **MUST** have the FCC ID number somewhere on it, or it is illegal to use. You will be reading more about in the future.

Time to have your gear checked!!

I have been busy working on a new model for the season, and I'm sure you have been doing that as well. Before you get it all completed and have it ready to go, take a minute and see if the radio equipment is ready as well. Now is the time of year that you should be thinking about having your equipment checked so that it will be ready for a full season of flying fun! If your equipment has been sitting dormant during the winter months, you should consider spending some time evaluating what you have and what may need to be looked at before you make that first trip to the flying field in the spring.

Batteries are always suspect, especially after non-use. I make it a policy to replace my battery packs every two years at least. With the cheap price of batteries, it only makes sense to replace them. Don't forget about the transmitter battery pack either. These are easily forgotten. We have had a lot of discussion in this column over the past few months on batteries and chargers, so you should see by now that it is a very important element of our systems. Take the time to look over the connectors on the batteries, switch harness and servos. Fuel, humidity and time can cause connectors to corrode, especially when many of the less expensive servos do not have gold-plated contacts any longer. Look closely, making sure the metal shows no signs of discoloration, which could be a telltale sign of corrosion in the making. If you find a problem, take an old toothbrush and clean it using alcohol. Brush vigorously and dry using a paper towel. Look at the pins on the receiver as well. Clean, if needed. Give everything a good charge and check the packs using an ESV. If all looks good, you should be ready for the season, provided you have been getting your gear checked at least every other year at a service center.



Photo 3 Spektrum 8 Channel module

SWAP MEETS

These are a great place to pick up some wonderful bargains on R/C equipment, aircraft, kits, engines, and lots of other goodies. With many of today's modelers moving into the 2.4GHz area, there are great deals on 72 MHz stuff available! While I think the 2.4GHz stuff is great, it is really not needed for many people. What I mean is that if you fly at your home field, only, and usually with the same group of people, 2.4GHz's security is not really a big deal to you. You are very unlikely to be shot down

by one of your normal flying buddies. The problem comes into play when you are in a different venue or at an event away from your home field. Now, the security of 2.4 GHz is important. So, you need to think about how, where and when you fly, and you might find that 72 MHz is all you need. The good thing about that is that the bargains are there on 72 MHz equipment!

You can attend anything from a local club event on a small scale to some of the larger ones like the Southeastern Modelers Show in Perry, GA, on the first Saturday of March each year. I am looking forward to attending this in 2010 as well. Many of you are loyal readers of R/C Report Online and follow the Radio Ramblings column each month. I look forward to seeing you there again next year. One thing you have to do when purchasing most anything used, especially at a swap meet, is do some homework and know what questions to ask! This is especially important when looking at used R/C gear.

I get phone calls every week from modelers who have purchased the "deal of a lifetime" radio system at a swap meet. Then, they call to find out what it will cost to get the unit checked over to be sure it is reliable and airworthy. Some are able to find really good deals and purchase some equipment at substantial savings, and only a tune-up and check of the system is all that is needed to give peace of mind to the new owner. It seems that we R/C modeler's like to upgrade to the latest and greatest sometimes without any consideration of real need. After purchasing this new whiz-bang system, we find we don't use the old reliable radio as much anymore, so we put it up for sale at a swap meet. These systems are eagerly gobbled up by the ever watchful eyes of a seasoned pilot looking for a good deal. However, sometimes I find that some oldie but goodie systems are sold many times in an unknown condition. This is where problems can start.

Let me give you a few hints when purchasing used equipment.

1. Just because it is inexpensive, does not mean it is a good deal.
2. Ask questions about the history and condition of the unit, especially batteries.
3. Does the transmitter have a narrow band sticker on it?
4. Is the receiver a new narrow band unit, or the original equipment?

5. Buy smart. If the cost is more than one-half the cost of a new unit (that has a warranty) perhaps it is not the best purchase you could make today!
6. Find out if the seller has some kind of guarantee that the equipment will perform as he/she describes. If not, will you be allowed to return it for a refund?

Rule #1 is the one that gets most people. If you see a complete radio system for sale for \$30, keep in mind that you will be lucky, in most cases, to get \$30 worth in the long run! Most likely there is a good reason that the seller is asking such a low price. It could be that the cost of repair/upgrade on this system far outweighs its worth.

Most older systems will be AM modulation. There is NOTHING wrong with AM! It works just fine. As a matter of fact, I can remember when everyone was scared of FM! "You'll never get me to fly one of those FM systems", was the normal talk at the flying field. Now, twenty years later, the talk is reversed! I even hear some who think that AM is actually illegal! The truth is that both are fine and will work well in today's environment, but it is actually cheaper and easier to build FM equipment that meets today's narrow band standards.

Determining if a transmitter is narrow band is the first order of business. If it is an older unit, it will have the gold sticker narrow band certification on it somewhere. The reason you don't see the stickers on new transmitters any longer is because the requirement for the sticker was dropped a few years ago. Now, all equipment being manufactured meets the narrow band requirement right out of the box. Take the time to inspect the TX closely for the sticker. If it is not there, you might be purchasing something that cannot be made narrow band! On the other hand, it is possible that it could be narrow banded by a service center for \$15 or so. When the new requirements came out, manufacturers were working to modify existing designs to meet the new specs. Almost every manufacturer was able to modify their unit by changing a few components and re-tuning in order to meet the new rules. This is where it can get sticky. The FCC allows modification to the RF circuit to meet the narrow band requirement ONLY if the original manufacturer or its official service stations came out with an FCC approved modification. If the company (or its

service stations) was out of business before a mod was made, the system could not be legally narrow banded. All of the major manufacturers out there today did come up with mods for most of their equipment, and for the equipment that they didn't design mods for, they offered, during a period of time, some kind of trade-in or upgrade deal to allow the consumer the opportunity to get the new technology equipment without having to purchase all new gear. Many, many people took advantage of this opportunity, and some manufacturers were backlogged in getting equipment updated for its customers. As far as the companies that were out of business, nothing could be done, legally. There have been some companies that have modified equipment, and it works very well. However, it is not technically legal. I doubt that there would ever be a problem with this, but if an accident occurred with this equipment and a very shrewd lawyer was involved; it could become a big problem. AMA does not say a lot about this; as they probably don't have any idea how wide-spread this might actually be. However, there are most likely very, very few of these operating today.

Receivers are another problem all together. They were never modified to be narrow band. If the receiver was not narrow band when it was built, it could not be made narrow band. No, how do you tell? That was a problem, even years ago! There was a listing of approved narrow band receivers in the back of Model Aviation for a month or two back in the late 80's-early 90's. This has long since gone out of date. This is where the problems start. Some companies never made a narrow band AM receiver; they just converted their equipment to FM. Others came out with new AM receivers that met the requirements, but changed the connector design in order to help the modeler know which was which. Still others came out with after-market receivers (Which worked great!) with both the old and new style connectors! So, what help is there for the swap shop buyer? Here again, learn about the gear in which you are interested. Read some older magazines and ask your club members who were around at the time this gear was the top of the line. They probably will have enough insight to help you out. The other option is to contact an independent service center for information. Most will be more than happy to help educate you. If you show up and purchase something you know nothing about, just remember the immortal words of Mr. Barnum:

there's a sucker born every minute! Make an informed decision, and you will walk away happy, and still be happy a month later.

Transmitters and receivers are not the only problem. As you might have figured out, if a receiver has to be replaced, the connectors may not be the same! This might mean that you will have to replace connectors on servos, switch harness, battery pack, charger, extension, etc. This is not an inexpensive task. I have not said anything about batteries. Just review our last few articles. My opinion is, when purchasing used equipment, is **THROW AWAY THE BATTERIES!** Plan on having to replace the packs, as a matter of fact. This will only cost around \$40-50 for TX and Rx batteries, and is just not worth the risk. Your model IS worth that, isn't it?

Now that great deal you are looking at on the table in front of you hopefully takes on a different light. Keep in mind that I am NOT against purchasing used gear at swap meets! As I said earlier, you can find really good deals on equipment. However, you have to sift through the junk as well. Be smart. Be informed. Make a good decision based on the information you can get from inspecting the equipment and from asking questions from the seller. Don't let the heat of the moment get you into something you are not sure about.

Keep the e-mails and letters coming. Keep in mind that it is much easier for me to answer you if you send me an e-mail at tony@radiosouthrc.com

Get those batteries charged and go flying!

Tony

Two Old Scale Guys

BY: Dick Watz and Bill Hurt

Dick:

Welcome again Bill, from Geezer Gulch North. Well, I did it again Bill, I painted myself into a corner. Eric's F4U is unfinished, my practice YMF5 is unfinished, the drawings for the UPF7 are (You guessed it!) unfinished; and I just took on therapy three days a week.

Bill:

Sounds like a typical month for those of us who are getting to the retired stage in life. It seems as if I have less time to do what I want to, and have more to do every day down on the South end of Geezer Gulch.

Dick:

Bill, I have an email asking why I don't recommend down or right thrust in my 5th scale P51; as I stated in an earlier column. I thought that I made my position clear on using built in thrust in R/C models, but more and more people seem bent on using offset thrust.

Bill:

Dick, quite a few people (if not most) have bought into the premise that all R/C models need right and down thrust to be built into the model. That probably all started with the advent of flat bottom airfoils and lots of positive incidence that were, and still are used on trainers. Fixing an offset thrust angle on the engine will only work well at one throttle setting, and may very well hinder the performance of the model at another throttle setting. I don't use these offsets, ever, and fly the model rather than allowing the model to fly itself. I think that this one is best left to the modeler; and if they are more comfortable using thrust offsets, then so be it. I can only think of one full scale aircraft that uses a reciprocating engine that has thrust offset built in. It's not a very popular series of plane either, and the offsets make the prop to cowl transition look odd most of the time.

Dick:

The sliding canopy is in progress, but I have

no good pictures yet. I'm starting a 1/4 scale Cub, as soon as I get the CSO ready to fly again. If the weather holds out, we will retest it this weekend. The CSO was built in 1985 just before I started Aerodrome, and at last count had over 1300 flights. You read that correctly; 1300 that I actually counted. A friend of mine, Curt Spicer, had the plane for a long time, so the actual count could be somewhat higher. My point is, if a scale plane can make that many flights, the old argument that scale is hard to maintain and keep flying is just bunk. It made the first 1300 flights with an OS 90 – 4-stroke and a Proline Radio. It now has an OS 70 – 4-stroke and a JR 9303 radio, so we are not ready for more flights. The only damage I could find on the plane was a fin to stab brace wire. I'll have it repaired after therapy today, and it could be flown sometime this weekend. An underlying feature with the WACO 10 (I don't mean to confuse you.), is that the Waco 10 (CSO) utilizes a straight wing and an undercambered airfoil. The airplane is called both CSO and Waco 10. The bottom wings on the model are held on with two 6-32 bolts; the same as the full size. Well, the full size didn't have 6-32 but it is held on with two bolts. The wings are held in place with flying wires, as is the full size. Modelers have asked, are you sure that arrangement will work. I would say after 1300 flights; you be the judge.

The flying wires on this model are 175lb test stainless steel braided cable with brass Swedes. All attach points are in hardwood and placed on the spars, the same as the full size. This plane suffered a mid-air with Eric's 109, made a lap of the field, landed and the bottom wing fell off on the ground. It was repaired in a matter of minutes and was back in the air. This just goes to prove that copying the full size works. Three days later, I hit a 6000 volt power line with the wheels. The WACO went into a flat spin, and landed 30 yards away in an apple tree. When we got to the tree, we had to go back and get the transmitter. The engine was still running. I have some picture of the attach points, flying wires and hatches showing the wing attach point in which you may be interested.

Bill:

Dick, if memory serves, the CSO used an undercambered, airfoil did it not? It was kind of an unusual design from a WACO for the time. Wasn't the combination of a straight wing with an under cambered airfoil just a little overkill? I wonder what they were trying to accomplish with that combination. It should have been a great flying model though. I would expect that the modern OS FS-70 should produce more power than the original .90...a lot more. The usage of flying wires to affix the wings to both the fuselage, and to each other is probably not something comfortable for the average new scale builder. Most models that use flying wires have the wires added as an afterthought, rather than using them as structural members of the airframe. Y'all look closely at how this is done before you try it yourselves. Kind of like the statements that read: Professional stunt actor...don't try this at home.



Dick:

Let's take another email. Dick, you promised to reprint Eric's piece on using Monokote, as soon as possible. I've seen Eric's planes, and they are beautiful. Ken, that was a good article and we will run it again soon. I traded my P51 to Eric for an unfinished P51. I plan on finishing this new plane with fiberglass and resin. I'll get some pictures in an upcoming column covering that project.



Bill:

Another facet of scale building that just won't go away is the issue of detailing correctly. Most of the time, these details are merely an illusion. Seeming to appear that these parts are actually a real part of the airplane, and in the case of the full scale counterparts; they really are. When used on a model, they are just there to replicate the parts that are on the full scale. Case in point, is the wheel pant cuffs that fair the wheel pants into the landing gear legs. In most cases, the wheel pants are merely bolted to the landing gear legs, or are clamped to the axles. This does not look bad when the model is in the air, or if it's simply a sport plane. Where the problem arises is when the model has to undergo Static judging, and there is no transitional piece to blend the pants and gear. Enter Lonnie Johnson. Lonnie lives in the frozen North part of Hendersonville, Tennessee, and is in the process of building and modifying an AMR Waco YMF in 33% scale. Lonnie has been working on his YMF for several months now, and has found out the hard way that there is a vast difference in what comes in the box, and what is necessary to be able to field a scale model for competition. He built a set of plugs that replicated the wheel pant cuffs (left and right), and then made a set of molds from these plugs. His efforts paid off, because his parts fit the wheel pants and gear legs just as the full scale does. One thing normally does not take care of a problem though, and he wound up having to do some modifications to the gear legs to be able to use the cuffs.



Another annoying problem that normally rears it's ugly head during a build is building the cockpit into the model. Now we all know that Gordon usually glues a Popsicle stick across the cockpit opening and glues a pilot bust onto that. (Sorry Gordon, the devil made me do it.)

The major problem is that to replicate the scale cockpit, one must take into consideration that in some full scale airplanes, the cockpit floor is very far down into the fuselage. In the case of most of the Golden Age airplanes (and especially biplanes) the cockpit floor is actually built into the bottom wing, or mounts onto the main spars for the bottom wing. This means that to be able to use a full pilot figure (not a full figured pilot like Gordon) you must use up all of the available fuselage area to be able to have correct scale depth of the cockpit. Most of us grew up using the area above the wing saddle to mount the servos, and this means that we have to use a very shallow cockpit to leave space for the servos and other radio gear.

On my current Waco build, I decided early on that if I was going to be able to use my full pilot figure and a scale seat and cockpit; the servos were going to need to find a different place to reside. This meant redesigning the airplane to provide access to the servos and radio gear, since I don't always get the linkages just right the first time; and need to have access to make adjustments.

I had already made a nice seat that looks like it was made from aluminum sheet and tubing, instead of being made from card stock and scrap tubing, and it fit the scale cockpit to a T.



That meant that I would need to build in a servo bay immediately behind the wing saddle area, and so I did. Now my model has a few other features that you don't normally see in a model airplane. One of them is an in-flight adjustable horizontal stabilizer. The full scale airplane could have the leading edge of the horizontal stab raised and lowered in flight to assist with trimming up the airplane. I wanted this



as well, and so I built it into the model early on in the framing sequence. I also use a separate servo to drive the tail wheel so that I can set it up to move fractionally in proportion to the rudder. This meant that I needed to house four servos where most people normally use two. I reinforced the area by substituting spruce for balsa in the stringers in this immediate area, and built a matching hatch for this servo bay. When installed, there is a faint line visible, but that is all. I can remove two small screws inside the wing saddle opening, and remove the hatch and am able to get my hands into the bay for servicing the equipment.



Tom Crump (out of Michigan) has posted some pictures of his Space Walker, and once again he has outdone himself with his building and finishing skills.



Tom is also building a scale version of the Cessna 195 from Wendell's plans, and he and a buddy have been able to cast some outstanding control yokes and yours truly was fortunate enough to get the last pair of them.

The molds were damaged beyond repair when pulling my set, and sadly, more yokes are not available from Tom now.

I have the 195 that Dick built and displayed at the Toledo Show in 2008 (the red and maroon one), and am in the process of amassing the scale detail parts to really scale it out. Those of you, who know me, know that normally I would not own a model that someone else has built; but I just had to have that one. Dick helped me out with that. I'm thinking that a Seidel radial will fly it nicely. (Yes, Gordon, that makes it an ARF. Kinda; sorta.)

Dick Watz
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Bill Hurt
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MANEUVER OF THE MONTH: SIX SIDED OUTSIDE LOOP

This is column number 109, starting my 10th year of Fun Aerobatics. I'm glad you guys have enjoyed it. I'm hoping for many more years of instruction and BS. This is the Christmas issue, so leave explicit lists of the goodies you'd like, along with where to order. This is probably a tighter year moneywise for nearly everyone, but there are many RC stocking stuffers anyone can afford. Your hobby shops need your support, too. For us, when you read your issue, click on all the advertisers and check out their sites. That's how we get credit for the ads-at least that's how I think we do.

Normally, I would review the year and provide a comprehensive listing of all past maneuvers and features. Now that R/C Report is online, you can research past issues to your heart's content and download anything as a PDF. This means I can skip the listing and go on with another maneuver. In the November issue, I covered the 6-sided inside loop. For December, I'll do the 6-sided outside loop. It also means that all you guys who have asked for a book of my maneuvers can download the PDFs, print them and laminate, and store in a binder or however you want to keep them.

DESCRIPTION OF THE: SIX SIDED OUTSIDE LOOP: The 6-sided outside loop is a downward starting outside loop with 60 degree corners. You'll remember that in the outside square loop you made 90 degree corners.

KEYS TO DOING THE: SIX SIDED OUTSIDE LOOP: There are three keys to doing any of the downward outside loops: having a plane with good down control and starting at a comfortable height.

AIRPLANE SET-UP FOR DOING THE: SIX SIDED OUTSIDE LOOP: You need enough down control so you can use full down without snapping or rolling off.

DOING THE SIX SIDED OUTSIDE LOOP

Standard Set up

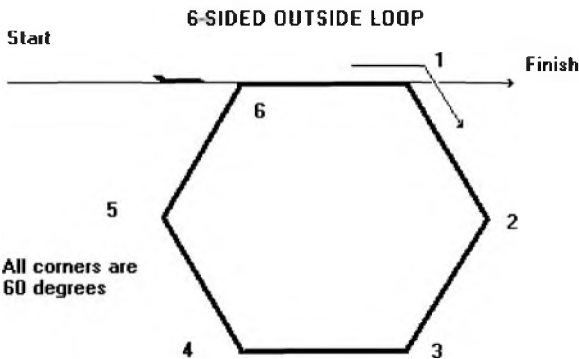
1. Full power,
2. Parallel to the runway, and 3. Two mistakes high.

The 6-sided outside loop should be started flying up, or into, the wind.

CORNER 1: Push down into a 60-degree dive.

There is no need to use full down. Half stick should be fine. From doing outside square loops you should have a good idea of how much to push. Make the dive about half of the leg of your outside square loop. Some of you may want to reduce power, especially if you did so on the outside square loop. Just remember, on the inverted leg, you'll need to move the throttle back to full power.

CORNER 2: Make another 60 degree push. This should leave you in an inverted 60-degree dive.

RC REPORT MAGAZINE	
TEACH YOURSELF AEROBATICS CARD	6-Sided Outside Loop By Ed Moorman
DESCRIPTION OF THE: SIX SIDED OUTSIDE LOOP: The 6-sided outside loop is a downward starting outside loop with 60 degree corners. You'll remember that in the outside square loop you made 90 degree corners.	
KEYS TO DOING THE: SIX SIDED OUTSIDE LOOP: There are three keys to doing any of the downward outside loops. These are having a plane with good down control, learning the easier ones first and starting at a comfortable height.	
AIRPLANE SET-UP FOR DOING THE: SIX SIDED OUTSIDE LOOP: You need enough down control so you can use full down without snapping.	
DIAGRAM OF THE 6-SIDED OUTSIDE LOOP	
	
DOING THE SIX SIDED OUTSIDE LOOP	
Standard Set up 1. Full power, 2. Parallel to the runway, and 3. Two mistakes high.	

Watch the angle here because your plane will tend to steepen the dive toward vertical.

CORNER 3: After the same distance as your first leg, do another 60-degree push to inverted flight. Your plane will be fast even if you did reduce power, but don't let this fool you. Add the power back in or you'll run out of steam in the climb.

CORNER 4: Make your fourth 60-degree push to an inverted climb. The hard part's over and we are just climbing up to the finish.

CORNER 5: Halfway up to your initial altitude, make a 60-degree push. You are now in an upright 60-degree climb with the speed getting pretty slow.

CORNER 6: At level off altitude, give an easy push to level flight; and you're done.

CORNER 1: Push down into a 60-degree dive. There is no need to use full down. Half stick should be fine. From doing outside square loops you should have a good idea of how much to push. Make the dive about half of the leg of your outside square loop. Some of you may want to reduce power, especially if you did so on the outside square loop. Just remember, on the inverted leg, you'll need to move the throttle back to full power.

CORNER 2: Make another 60 degree push. This should leave you in an inverted 60-degree dive. Watch the angle here because your plane will tend to steepen the dive toward vertical.

CORNER 3: After the same distance as your first leg, do another 60-degree push to inverted flight. Your plane will be fast even if you did reduce power, but don't let this fool you. Add the power back in or you'll run out of steam in the climb.

CORNER 4: Make your fourth 60-degree push to an inverted climb. The hard part's over and we are just climbing up to the finish.

CORNER 5 Halfway up to your initial altitude, make a 60-degree push. You are now in an upright 60-degree climb with the speed getting pretty slow.

CORNER 6: At level off altitude, give an easy push to level flight and you're done.

OK, that's the details, now here's what you do. Fly by in front of yourself and make 6 quick pushes just to get through the loop. Count 1 Mississippi, 2 Mississippi, 3 Mississippi, 4 Mississippi, 5 Mississippi, 6 Mississippi. On the numbers, 1, 2, etc., you pull. The time it takes you to say, "Mississippi," is the length of the leg. Try it.

Once you can do the loop, start checking your wings on every leg. If the wings look like they aren't level, make a little correction. Make your corrections in the TOP half of the loop. For the 6-Sided Loop, this is in the leg after the first corner and on the last leg, the 60-degree upright climb.

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What to do:

Okay, that's the detailed instructions; now here's what you do. Fly by in front of yourself, and make 6 quick pushes just to get through the loop. Count 1 Mississippi, 2 Mississippi, 3 Mississippi, 4 Mississippi, 5 Mississippi, 6 Mississippi. On the numbers, 1, 2, etc., you push. The time it takes you to say, "Mississippi," is the length of the leg. Try it. Once you can do the loop, start checking your wings on every leg. If the wings look like they aren't level, make a little correction. Make your corrections in the TOP half of the loop. For the 6-Sided Loop, this is in the leg after the first corner and on the last leg, the 60-degree upright climb.

FEATURE OF THE MONTH:

Radio Control during World War II

You probably didn't realize, but there were several uses of radio control during WW II. Both the Army, Navy and civilian companies used RC.

Radioplane Corporation: Before WW I, Reginald Denny was an actor and singer in Britain. During WW I, he was a gunner in a twin seat plane, starting his interest in aviation. After the war, Denny moved to Hollywood and acted in silent movies. When talking movies came out, Denny, who had a good voice; made the transition, playing an urbane uncle or older father. He never became a big star, but was in many movies. He also started flying models, opened a hobby shop in Hollywood and flew a free flight design called the Dennyplane using an engine called the Dennymite. These were manufactured by Reginald Denny Industries.

When WW II started and the services needed flying targets for anti-aircraft practice, Denny had an RC plane designed and produced it for service use. The name of the company was changed to Radioplane Corp. Radioplane was bought out by Northrop in 1952. Up to that time, they had delivered 45,000 target drones! That is a group of RC planes, guys. And I didn't even realize we used RC planes in WW II. An interesting fact about Radioplane is that Capt. Ronald Reagan sent photographers to their plane to take pictures of women helping in the war effort to go in a magazine. Denny was a buddy of Reagan's and the plane was in Ventura, not far from Hollywood. One of the pictures he took was of a pretty, 19-year old named Norma Jean Baker. She didn't make the magazine, but her photos got circulated to producers who

offered her a screen test. Norma Jean Baker wasn't a good Hollywood name, so it was changed to Marilyn Monroe and the rest is history.

Interstate TDR-1: Back in 1936, a Navy admiral saw the British Queen Bee, radio controlled flying bomb demonstrated. On his return to the US, he had a Navy program set up. Lt Commander Delmar Farnhey was the leader. Farnhey is credited with the name "drones" for his planes to go along with the Brits' Queen Bee. In 1938, Dr. Vladimir Zworykin from RCA was added to the team, bringing a TV camera to the concept. They went through a couple of different designs, but ended with the TDR-1, a twin engine plane with either a bomb or a torpedo underneath. The power was two Lycoming, flat 6 engines. All of the TDR-1's had a cockpit and were flown with a safety pilot unless it was on a live test where the cockpit was covered. The landing gear could also be dropped for actual combat. Control of the TDR-1 was from a modified Eastern Aircraft built, Grumman Avenger, TBM-1C, with a retractable dome in the torpedo bay. The electronics in the dome receiver TV signals from the TDR-1 and the operator could send out steering signals with his joy stick. Forty five TDR-1's made it into combat. There were 37 attacks made with 21 hits. The TV reception was so bad that only very high contrast targets were able to be found. The best were on the shore line. The Japanese were so startled by American planes crashing into their ships and harbors that they thought, and Tokyo Rose reported, that the planes were American Kamikazes.

After the war, the program was cancelled, the remaining planes were sold as surplus and the Avenger control planes were pushed off the end of a barge into the ocean.

Army Glide Bombs: The Army Air Force contracted for and built several bombs with wings and tails attached called "Glide Bombs". These used the designation GB. Some were radio controlled and some were not, but it is interesting to see what they tried.

GB-1 was an Aeronca built weapon with twin booms and a 2000 pound bomb warhead. It was gyro stabilized, but not controlled. About 1,000 GB-1s were used in combat, but they weren't accurate and gave poor results.

GB-2 was a Bellanca built competitor of the GB-1 that was cancelled

GB-3 was a Timm built competitor to the GB-1 that was cancelled.

GB-4 was an Army designed and built 2,000 pound bomb with wings and tail. It was TV guided and steered from the launch aircraft. It performed well in tests, but due to the poor quality of the TV reception (The same problem the Navy had.), the combat results were poor.

GB-5 was a GB-1 with a TV homing seeker for high contrast targets.

GB-6 was a GB-1 with an IR seeker.

GB-7 was a GB-1 with a radar homing seeker.

GB-8 was a GB-1 with RC and flares on the tail so the operator could see the weapon and steer it.

(Interestingly enough, a weapon like this was used in the Vietnam War. The Bullpup was a guided weapon with flares on the rear. I had one Bullpup mission and you had to fly the same trajectory as the bomb to see the target to aim in range and cross-range. You also had to slow down so you didn't pass it. They were not anyone's favorite mission.)

GB-9 was a GB-4 with the addition of a radar altimeter to allow it the dive to gain speed, then level off and continue to glide to the target.

GB-10 was a GB-1 with a GB-4 guidance system that was not built.

GB-11 was a GB-1 with a chemical dispersant tank instead of a 2000 lb bomb.

GB-12 was a GB-5 with a different TV homing seeker.

GB-13 was a GB-5 that homes in on target marking flares.

GB-14 was a GB-7 with its own on-board radar with homing.

GB-15 was a GB-4 follow-on, but was not finished by the end of the war and cancelled.

One other glide weapon from WW II was the GT-1, for glide torpedo #1. The GT-1 was a GB-1 with the 2000 lb bomb replaced with a Mark 13 air-dropped torpedo. Several of these were used in the Pacific and were dropped by B-25 bombers.

That's it guys. You can see that there were many, many radio controlled drones, planes and bombs tested and used during World War II, a lot more than I knew about until I researched this.

*Everyone have a Merry Christmas
and a Happy New Year.*

*Ed Moorman
Morrman1@cox.net*

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Background Art Courtesy of Steve Anderson: Du Doch Nicht!!

Hello Scale guys, another month has come and gone. It's now December, and thoughts of what Santa might leave under the tree for your new project is driving you all crazy. I have so much I want to share with you this month; I hardly know where to start... So go grab a fresh cup of coffee or your favorite beverage and let's just sit back and talk Scale; shall we?

Starting off this month with some more photos of scale models and their owners attending the D.O.G.S show last September is Rick Barch and his Bob Nelitz plans built 112" Taylorcraft. Rick really puts on a great show with his low level scale aerobatics and one wheel landings. The plane uses a DA100 twin for power and a Futaba 10C with the 2.4 FASST system for guidance.



Photo 1 is of Rick and his Taylorcraft, and photo 2 is of one of his very low knife edge passes. The next aircraft to catch my eye was this huge 122" wing span P47, built and flown by Manny Huysentruyt of NC. Manny built it from Don Smith plans, powered by a 3W 21.5 hp, 212cc 4 stroke radial engine. Featuring Sierra retracts, 10C Futaba radio with the 2.4 FASST system.



Manny told me the paint is from rattle cans. This guy can do a mean rattle can paint job; I'm telling you all! The plane weighs in at 70 pounds and Manny uses all 330oz Hitec servos on the control surfaces just to be sure they can handle the load. He also uses two 3200 ma NiMH batteries for the radio, and two 3000 ma packs in parallel for the ignition. Manny can really make this P-47 look real in the air.

For you classic scale guys, here is John Bradley, Photo 5, with two of the four gorgeous giant scale models he brought to the show. The one on the left is an 111" Waco WMF5 powered by a DA100 twin, 50# all up weight and is as close to being a real Waco that a model can get. The other model is 118", 53 # PT17 Steerman. This model was built and then painted with the same paint as the full scale prototype used. It is an exact duplicate of the full scale. Both models used the new Futaba FASST system for guidance. John has been known for many years for having some of the most outstanding models at these events. John had Jason Knoll (left) do the piloting chores for the Steerman while John flew the Waco together in formation



Photo 5

Photo 6. Next is my long time friend from Lexington, KY, Gale More. Photo 7. The plane is a 98" wing span Ziroli P-51D Mustang. The model is powered by a Fox 5.8 cu. in. engine and a Futaba 2.4 FASST system is used for guidance. The plane's all up weight is just 28 pounds. Gale has been building and flying Mustangs for years and is a true consummate in flying this model in a truly realistic scale manner. His wheel landings are legendary! Photo 8 is of his Mustang on short final returning again from another successful mission. That is all the room I have for this month for the D.O.G.S show; more to come next month.



Being a part of the scale contest scene for many years, as I have said before, has afforded me

the privilege to meet many of the top builders and fliers around the globe. Some of them I have come to be friends with over the years. One of those fine gentlemen is none other than Mr. Dave Johnson. Photo 9.



Dave is one of the best examples of a scale modeler in both his ability to design, build museum masterpieces from scratch, and then fly them in a truly scale manner. Dave always has that great big smile when he greets you. (Some, including me, think he looks like a younger Gary Busey; and he gets people coming up to him at airports wanting an autograph). Dave, even at the level he is presently at, still is humble enough to come to the judges after a flight and ask what he can do to improve his flights. From this interview you will take away with you Dave's passion for the builder's art, and the determination to do his very best. Dave's main passion is for WWI aircraft, which in themselves are very hard subjects to compete with due to their low wing loading. They normally have a tail skid instead of a steerable tail wheel. However, Dave has been in the top 5 in all of the contests in which I've ever seen him fly. This year alone at the Nats he placed 2nd in Expert Class with his new Fokker DVII, 2nd place in Designer Scale with his huge Albatross DV, and 2nd place in F.A.I. with his newly designed and built Albatross DV, which had to meet F.A.I. size and weight specs. He also won 2nd place in Masters



Class at Top Gun this year! Dave's aircraft always have statics in the upper 90s and flight scores in the high 90s as well. You have to see Dave's models up close to appreciate all the attention to detail and weathering he does. If you watch him in the pits, you will see him going over his aircraft after each flight to make sure it is ready for the next round. He leaves nothing to chance. Photo 10 shows Dave's intense concentration level while flying a round at the NATS. Photo 11 is of Dave's beautiful Albatross DV during one of the mandatory fly passes. Okay Dave, have a seat and let's talk about your scale model building and flying adventures.

RC Scale Builder/Pilot Interview Questions

Name: Dave Johnson

Occupation and education: Senior Manager of R&D, BS in Mechanical engineering, MBA

How did you get started in modeling, and at what age?

My dad started me doing free flight at the age of 4

Did you start with RC or other, such as U-control or free flight?

Free flight, then U-control and then R/C, first radio was a second hand galloping ghost.

Number of years in modeling:

41 total, 35 in R/C

What motivated you to build scale models vs. sport models?

I liked real planes; I wanted my models to represent them.

Did you have a mentor to help you get started in building scale models, or did you learn by trial and error?

Guillows and fortitude.

Have you flown full scale aircraft as a pilot? If so what types, and do you hold a pilot's license?

Nope

Can you remember your first scale model you built and competed with?

Rubber Band with a Peck Polymer Gypsy Moth. R/C was an Albatros DIII.

What was the result? Where did you place?

The Moth finished last☹. I finished 7th of 15 entries in Expert, including a field that included two Ziroli's, Roy Valincort, Charlie Nelson and Tom Polapink. I am a big advocate of starting in Expert

and skipping Sportsman. Why not find out where you stand sooner rather than later?

What motivated you to get into competition?

Stupidity☺, No, really it was a desire to see how my models stacked up versus others. The best result was becoming a better pilot by learning to place and accurately control my plane.

What is your favorite era and type of aircraft to build models of?

Jets!! I have been into WWI models since I was a kid. I designed my first scale R/C plane when I was 11 and it was an Albatros B1 two seater. I still have it.

How many days or hours a week do you average in building and flying models?

Building varies greatly. When I decide to build something it usually goes pretty quick. I probably fly 4-5 days a week. Park flyers and a big back yard make that possible.

When preparing for a contest, what is your procedure and amount of time dedicated to get your self ready and confident with your model?

Starting about a week before a big contest I run through my routine about a dozen times a day in my back yard with an ElectriFly Fokker DVII. It represents the flight envelope of my current competition aircraft quite well.

What advice would you give a new modeler to scale competition?

Like Nike says, Just do it! Ask lots of questions and emulate those who are successful. By doing this and the fact that Roy Vallincort and Jack Buckley were willing to help me, I managed to win two contest my second year competing.

Thank you Dave for taking the time for this interview, I know a lot of future scale model builders will gain insight from your comments.

Next month I will get back to Robert Ball's A6M2-N "Rufe". I can tell you it is coming along very well.

Until then, I want to be first in wishing you all a Merry Christmas and a Happy New Year.

Fair winds and Blue skies my scale friends

Gary Webb

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MODELTECH

a kit review by terry dunn

ARF Giant Scale Super Cub



Model.....ARF Giant Super Cub
Airplane Type.....Giant Sport Scale
Manufacturer.....Model Tech Models
Distributor.....Hobby People
Price.....\$159.99
Wing Span.....Advertised: 81"
 Measured: 80.5"
Wing Area.....Advertised: 900 sq. in.
 Measured: 855 sq. in.
Advertised Weight.....6.5 to 7.5 lbs.
Airfoil.....Flat-bottom
Wing Structure.....Two-piece design
Wing Joiner Method.....Aluminum joiners
Fuselage Structure. Built-up balsa and lite ply
Fuselage Length.....Advertised: 50.75"
 Measured: 50.75"
Pushrod Type.....Music wires in plastic tubes
Pushrods Installed.....Guides only
Hinges Included.....CA-type
Hinges Pre-installed.....No
Recommended Controls.....4
 (Ail, El, Rud, Throt)
Motor Mount InstalledNo
Motor Mount Type.....Two-piece composite
Landing Gear Installed.....No
Wheels Included.....Yes
Assembly Instructions.....B/W with many
 photos
Hardware: Metric or SAE.....Metric
Hardware Included.....Pre-painted fiberglass
 cowl with mounting screws, fuel tank, ply-wood
 servo trays, music all pushrod materials (music
 wire in plastic guide tubes), nylon clevises, control
 horns, and snap keepers, complete aileron
 hardware, CA-type hinges, sheet aluminum main
 gear with axles and mounting hardware, pre-
 formed tail wheel assembly, light weight foam
 wheels, steel wing bolts, hardwood wing struts
 with mounting tabs, clear plastic windshield, and a
 sheet of decals.
Items Needed To Complete.....5-ch radio
 system with six (electric) or seven (glow) standard-
 sized servos, 1.75" spinner, electric or glow power
 system with propeller (fuel tank and electric/glow
 motor mounts included with kit).

Covering Material.....Unknown
Estimated Assembly Time.....12(in hours)
Estimated Skills Required.....Experienced
Drilling Required.....None/(describe)
Adhesives Required.....CA and Epoxy
Assembly Tools Required.....Standard stuff

COMPLETED MODEL

Finished Weight.....7.9 lbs. (127 oz.)
Wing Loading.....21.5 oz./sq.ft.
Power System Used.....Grayson Hobby
 WA4120-07 brushless outrunner motor, E-Flite 60-
 amp ESC, Turnigy 5S-5000 mAh 15C LiPo
 battery, 12x6 APC Electric prop, and a Hyperion
 40mm spinner. Full Throttle Power with this setup
 at 38 Amps: 762.7 watts, or 96.5 watts/lb.
Flight Time w/above System.....15+ minutes
Propshaft to Ground.....10“(held level)
Radio Used.....Futaba 7C 2.4 GHz transmitter,
 Futaba R617FS receiver, four Futaba S3152
 standard digital servos (on ailerons & flaps), and
 two Spektrum DS821 standard digital servos (on
 rudder & elevator).
Covering/Finishing UsedPre-covered

CHEERS - Reasonably priced big bird; well thought
 out design, with parts included for wet or electric
 power; great covering job; nice flying sport scale
 plane; it's not another yellow Cub!

JEERS - Minor errors in the otherwise thorough
 assembly manual; one bad axle; both main wheels
 needed tweaking to fit axles; stock method for
 mounting the battery tray is suspect.

When the expected post World War II civil
 aviation boom never materialized, many airplane
 companies were scrambling for a way to keep aloft.
 Piper executives decided that they had to either refine
 the venerable J-3 Cub, or build a new design with
 sportier performance. Either way, it had to be done
 quickly and cheaply. When Mr. Piper found his
 company at this fork in the road, he took it (preceding
 the immortal advice of Yogi Berra). Both efforts
 would prove popular and profitable for Piper.

The new design became the PA-15 Vaga-bond. It wasn't really all that new since it used many Cub parts and construction techniques. Yet, with a wide fuselage allowing lateral seating of two occupants, it was different enough to attract a new audience. To get the desired speed boost, a standard Cub wing was reduced in span by 6'. Henceforth, the PA-15 and its derivatives, ending with the PA-22 Tri-Pacer, have been known as the "Short-wing Pipers".

Cub refinement efforts led to the beloved PA-18 Super Cub, which Piper produced until 1981. In contrast to the original Cub, the PA-18 features flaps and nearly double the horsepower (or more) tucked inside a full cowl. These seemingly minor changes transformed the unassuming J-3 Cub into a utilitarian beast of burden that is coveted today for its short-field performance. This is why so many PA-18's found their way into the hands of bush pilots in the Great White Frozen North. Even today few aircraft can match the versatility of a Super Cub, or the loyalty of its owners. There's now a company called Cub Crafters that currently produces a modern variation on the Super Cub theme. This airplane just won't go away!

In the RC world there are tons of J-3 Cub kits in all sizes. I'll bet the Cub worries only about the P-51 in its quest for the unofficial title of "Most Modeled Aircraft...Ever." Yet there are surprisingly few models of the *Super Cub* available. That's one reason I bought this kit. I get all the joy of owning and flying a Cub, but with the extra satisfaction of being a little different from the vast, yellow herd, even if only slightly so.

Another reason I bought this kit is the price, although that seems to fluctuate from week to week. I thought \$160 was a pretty good deal for an IMAA legal big bird. With an advertised maximum weight of only 7.5 lbs., and with mounts for an electric motor and battery, it seemed that the Model Tech Super Cub would be a no-brainer for electric power. You didn't really think I was going to fly glow, did you?

The kit comes with a black and white manual having lots of photographs. The first few pages are an inventory that lists and illustrates all of the kit's components. My inspection of the parts left me with a mostly positive impression. All of the wood

subassemblies appeared to be well built. The hardware looked good and plentiful. Still, I was most impressed with the covering. They did a *really* good job here. The covering seen in the photos is just as it came from the box. I have not retouched any areas with an iron or heat gun. The covering on nearly all of the ARF's I've built need a dose of the heat gun after a day or two in my non-air conditioned garage work area (especially during the summer months as with the Super Cub).

The only squawk I had with the kit was the fiberglass cowl. Most of it is very good. It's nicely molded, not too heavy, and the stripes match up perfectly with those on the fuselage in terms of color and placement. I was very happy to see that the cheek air inlets were already cut and trimmed. However, around the motor shaft cutout there were several cracks and some paint flaking. I assume this happened during packaging or shipping, and so far, none of the cracks have propagated, so I think this will continue to be a minor, cosmetic issue.



Photo 1: The fiberglass cowling comes nicely trimmed and painted. Mine showed evidence of mishandling via a few cracks.

Assembling the Super Cub begins with hinging the ailerons and flaps. Standard CA hinges are used, and the wood surfaces are already slotted. The only thing worthy of note here is that it is helpful to cut away a sliver of covering around the hinge slots. This will help the CA to wick into the slot for a strong bond.

The wing servos go in next. Each control surface gets a servo, and I used four Futaba S3152 standard digitals. These servos fit the cutouts fine, but it was interesting to note that the pilot holes for the servo

mounting screws were pre-drilled for the aileron servos, but not for the flaps. No big deal. The manual has a highlighted note directing us to mount all of the wing servos with the servo wheel towards the leading edge of the wing. I later had to turn them all around because the included pushrods were too short to fit the shown configuration.

Next we're directed to join the wing halves and mount them onto the fuselage. Just skip that step for now. You need the wing mounted so that you can align the tail feathers properly, but I still haven't uncovered the slots where the tail feathers go. This is much easier to do without an 81" wing attached! So open up the tail feather slots in the fuselage before adding the wing.

The wing it is a pretty nice set-up. Two aluminum joiners are permanently fastened into the port wing panel. The protruding ends of the joiner spars are then inserted into slots on the starboard wing panel. Two set screws engage notches on the spars to keep everything in place. Then the whole wing mounts to the fuselage with pegs in the front and bolts in the back. It's a nice, simple design that seems to work well.

Thankfully, I didn't have to shim the tail feathers to square them up. Everything aligned perfectly right from the box. I then hinged the rudder and elevator using more CA hinges. The tail wheel is slaved to the rudder, and I added it with no problems.

The main landing gear was the first place where I ran into trouble. The basic landing gear is standard aluminum sheet, but Model Tech replicates the bungee system of the full size Cub with some wire, balsa, and rubber bands. All of this works fine and adds a nice scale touch. The problem was with the wheels and axles. The axles are nothing more than shoulder bolts that fit through the plastic wheel hubs. Lock nuts thread onto the axle and secure it to the aluminum gear. Wait, I mean that's how it's *supposed* to work. The threads on one of my axles were fouled to the extent it would not screw into the lock nut. I replaced it with a 4mm diameter bolt from my hardware stash. The spokes on the plastic wheel hubs are cut away to allow the head of the axle to be recessed, but I had to further trim the

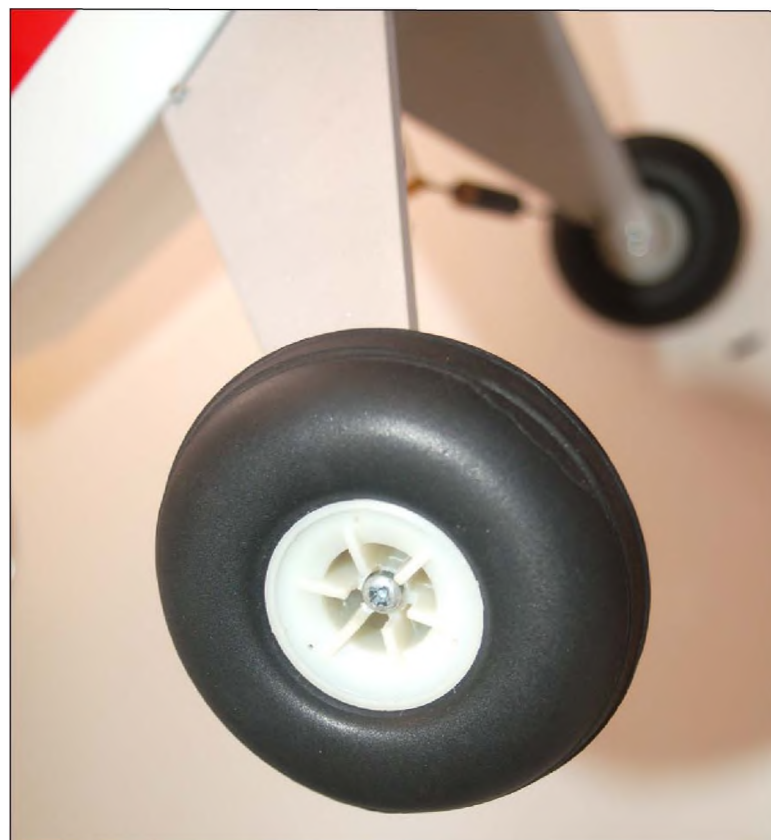


Photo 2: Model Tech uses standard landing gear materials to replicate the bungee-system used on the full-scale Super Cub. One of the axles and both wheels required some tweaking to work properly.

spokes on both wheels before the axle heads would fit without binding in the wheel. This area is later hidden by the plastic wheel covers (who remember hubcaps?).

As I said before, you can use an electric or glow power system, and the instructions show you how to install each. Motor mounts are also included for each setup. The glow engine mount is a standard two-piece composite beam mount. The electric mount is a plywood box that's to be glued to the firewall. Since the specifications were so similar, I used a Grayson Hobby WA4120-07 motor in place of the recommended KMS4120-05 motor.

I had to widen the holes on the Grayson motor X-mount just a little to fit the blind nuts on the forward firewall. The KMS motor will probably fit with no modifications. The kit does not include a spinner, so I used a Hyperion 40mm electric spinner, which is slightly smaller than the 1.75" ring on the front of the cowl.

Next up is the elevator and rudder servos. I used Spektrum DS-821 standard digital servos which fit into the provided servo tray perfectly.

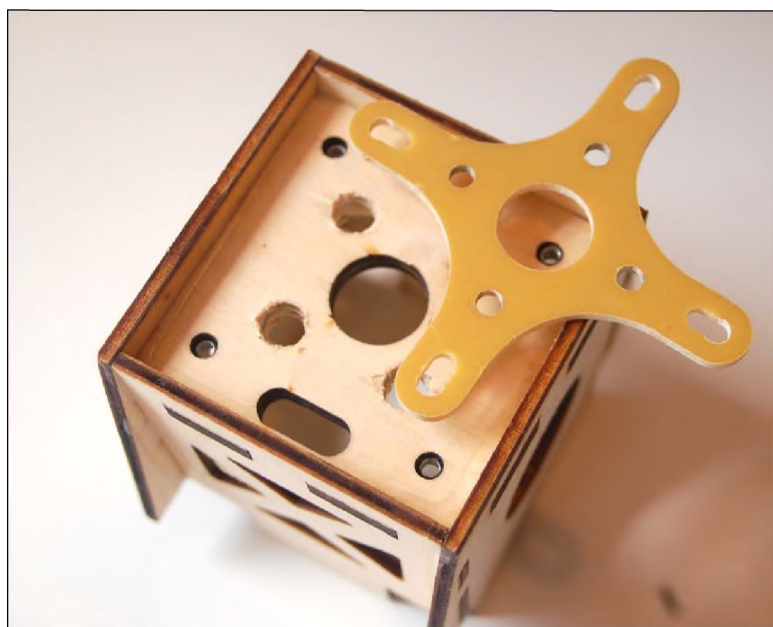


Photo 3: The included electric motor mount is designed for the KMS Quantum 4120/05 brushless motor. I had to slightly elongate the mounting holes on the x-mount of my Grayson Hobby 4120-05 to match the blind nuts on the firewall.

Each elevator half has its own pushrod, and the two pushrods are joined with wheel collars near the servo. The plastic guide tubes for the music wire pushrods are already glued in place. Near the tail, all three of these sleeves pass through a hole in one of the fuselage formers, but none of them are glued there. The result is that the sleeves flex and rattle, making noise and possibly affecting control surface deflection. I had already planned to cut a hole in the bottom of the fuselage as an exit hole for cooling air, so I placed this hole where it would allow access to add epoxy at this pushrod point, to eliminate the flexing.

When the time comes to install the control horns on the wing's control surfaces, I suggest ignoring the measurements given in the manual. I found three of the four measurements to be incorrect. Just use the servo horn as a reference, and mount the control horn so that the pushrod is 90° to the hinge line. Keep in mind that both flap pushrods must be attached on the same side of the servos to make the surfaces move in the same direction.

Model Tech includes a nice late-ply battery tray for the motor battery. The only problem is that they want you to glue it between the firewall and the next former, which provides very little gluing surface for a part that holds the heaviest component on the whole airplane! The battery alone weighs almost 1.5 lbs.! To beef this

up, I added 3/8" square hardwood doublers at the firewall and at the second former. Additionally, I added another bit of hardwood across the cutout of the former to further secure the mount. I also had to cut away part of the first former to provide enough room for my 5-cell battery, but a smaller battery may not require this. A thick Velcro strap holds the battery in place.

The kit includes pre-built hardwood wing struts. Slotted aluminum tabs on each end of the struts are fastened to the airframe with 3mm screws. All I had to do was trim away the covering from the blind nuts on the fuselage and wing. Everything then fit perfectly.

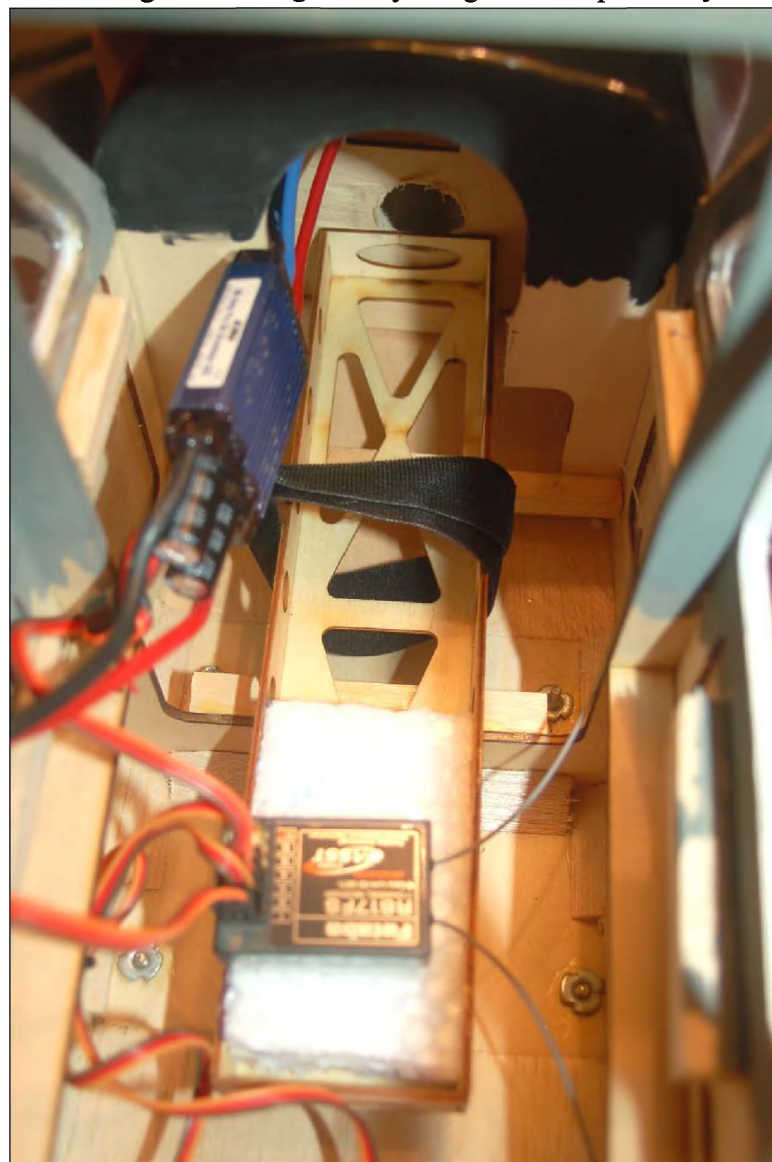


Photo 4: A lite-ply battery tray is included with the kit, but I felt that the mounting method required some beefing up. Adding 3/8" square hardwood doublers to the fuselage formers vastly increased the gluing area. Also note where I cut away some of the fuselage former to make room for the battery.

At this point the only thing left to do is install the windows. The model already looked pretty good, but I

saw an opportunity to improve its appearance even more, with very little cost and effort. First I used some cheap acrylic craft paint to fill in the areas of the window cutouts where the relief cuts in the covering allow the wooden structure to show through. I used a Q-tip and small paint brushes to apply white paint. Next I attacked the area by the windshield, painting all the bare wood with black. Lastly, I painted all the cabin area (above the servo tray) with a medium gray. A false floor made of sheet foam (also painted gray) hides the radio gear, and provides a convenient place to mount a pilot bust. All of this took about an hour, but it was time well spent. When you look through the windows now, there's no trace of balsa or radio gear.

I glued the molded windshield in place with canopy glue. There are also molded side windows that should be glued into place. I omitted the largest windows to allow cooling air flow. The missing window also lets me install and remove the motor battery without removing the wing, a big plus for me. A decal sheet also comes with the kit, but I liked its looks without any additional flourish, so I left them off.

Before I move on to the flight testing, I want to describe the power system I used. With an electric airplane this size, the motor and battery are often a significant expenditure. In this case, I wanted to explore the concept of building a big bird on a little budget. In my column I've talked about my inventory of brushless motors from Grayson Hobby. I bought several of them during a sale a few years back. Since the WA4120-07 from this stash is a very close match to the motor Model Tech recommends, I decided to use it and an E-Flute 60 Amp ESC also on hand. The great thing about this ESC is that it has a built-in switch-mode Battery Eliminator Circuit (BEC). This means that I don't have to use a separate receiver battery or separate BEC to power a radio system with six digital servos. That simplifies the system and saves a few bucks too. The final piece in my low-buck power system is a 5-cell 5000 mAh LiPo battery that I bought new from Hobbyking.com for \$50. That's a real steal if it holds up! All combined, I have less than \$200 in the power system for this airplane.



Model Tech recommends a 4-cell 4000 mAh LiPo with their setup. I chose a 5-cell battery only because I wanted the battery to be usable in my other big Piper, a 72" span, 9 lb. PA-22 Tri-Pacer, which needs the extra voltage of a 5-cell battery. By using a smaller prop, the power out-put of the Super Cub with a 5-cell battery is comparable to the 4-cell set-up. With a 12x6 APC-E prop, the motor produces 776.6 Watts, a little over 1 HP. With a ready-to fly weight just shy of 8 lbs., I'm close enough to the 100 Watts per pound power loading that I aim for with my sport models.

The larger battery weighs nearly 1/2 pound more than the suggested battery, so it seems only logical that my plane would weigh close to the advertised 7.5 lb. maximum. Logical, right? Sure, unless you have to add nose weight for balancing. Mine balances right at the rear of the suggested CG range, with my battery all the way up against the firewall, so the heavier battery was just right for me. Nose weight (or a modified battery location) may be needed with a lighter power system. I wouldn't worry about it, though, because even at 8 lbs. the wing loading is a very respectable 21.5 oz/sq ft.

Flying the Super Cub

The maiden outing was not what I'd planned. If I were a superstitious person I probably would have gone back home that day. But I'm not, so I didn't. First it looked as if I would not have a photographer, which kind of spoils the whole idea of having a photo shoot. None of my usual shutterbugs could make it, but I headed to the field anyway, hoping to draft someone already there.

When I got to the field I first noticed that I'd left the Super Cub's wing struts at home. This might have been embarrassing, except there was no one there to see it! I was alone! Oh well.

Despite these setbacks, I decided to go ahead and put in a couple of flights. After all, I didn't expect many surprises from a Super Cub.

I'd set my low-rates to the manual's suggested throws, but my high rates were set to all I could get without binding. I used 30% exponential on all channels, and I did not configure any rudder-aileron or flap-elevator mixing.

I spent a minute taxiing around to get a feel for its ground handling, and found no surprises. It went where I told it to, and needed very little power to scoot across my club's paved runway. For the first takeoff roll I gradually fed in power while concentrating on my rudder inputs to keep it on the runway. The Super Cub was airborne before I reached half throttle.

After a circuit around the field to set the trims, I dropped the flaps a little to see their effect. The nose pitched up immediately, just as I expected. This plane is definitely a candidate for some flap-elevator mixing! For now I just manually add some down elevator when I drop the flaps. I found that with full flap deflection, my manual mixing got a little squirrely. The air-plane slowed down well, but it takes a lot of down elevator to keep the nose from rising. Using programmed mixing will definitely ease the pilot's work load here.



Photo 5: Landing the Super Cub is easy. However, keeping the approach short takes a little practice in energy management. She likes to keep on flying and flying.

Surprisingly, the Super Cub is quite aerobatic. With the suggested throws, full deflection aileron rolls crank out fast enough that no elevator corrections are required while inverted. You can also slow down the roll and use the elevator to maintain altitude. Loops are as big as you want. Hammerheads are particularly fun. If you get sloppy with the rudder input, the big tail will

wag quite a bit as you swap ends at the top of the maneuver.

The Super Cub is fairly comfortable in inverted flight. It takes a bit of power and down elevator to keep level, but it does so without complaint. On the plane's second outing (*with* a photographer) I was comfortably making eye-level inverted passes down the runway. I told myself that I would repeat the maneuver until I heard someone say "Hey, real Super Cubs don't do that!" I was more than a little disappointed when that complaint came on the very first pass! Oh what the heck, I did a few more anyway. Why? Because.



Photo 6: Inverted flight is not big deal as long as you use plenty of power and a healthy dose of down elevator.

I've tried to stall the Super Cub, but it won't cooperate. With no flaps, no throttle, and full up elevator, it just mushes around while slowly descending. In normal flight this model is a little faster than I expected. I wasn't really expecting speed, but I don't mind it, either. I've found that I spend most of my flights at half throttle or less, using more only for strong climbs or aerobatics. I spend a lot of time doing touch and with-out ever needs much throttle. At reduced power settings, it will cruise around quite comfort-ably and project a much better scale illusion.

What *did* surprise me is the model's reluctance to slow down! This is probably a result of my plane being slightly heavier than suggested. It retains energy way better than I thought a draggy looking plane should. I overshot my first few practice approaches because it didn't slow down the way I expected. In later flights the wing struts showed that they add some drag, but the difference isn't drastic. Of course the flaps still work great to slow things down.

Landing the Super Cub is all about energy management. Come in without flaps and you will probably need a long, long approach to bleed off airspeed. Deploying the flaps a little (or a lot) will help keep it casual and close in. I guess I should start practicing my sideslips for some really short approaches. As you near the touchdown, the wing tends to go into ground effect, so you may coast a bit. Once I see the airplane floating, I feed in a little up elevator and it will make a nice 3-point landing, while also reducing the rollout. I sometimes have to add a short blip of throttle just after landing to keep from ground-looping. I doubt this is necessary on grass runways.



The power system I chose is a good match for this airframe. Full throttle power will get the Super Cub off the ground in a big hurry, and haul it around in very un-Super-Cub-like ways. What I like even better is that the moderate power settings I use most of the time allow for plenty of excitement (or leisure) and 15-20 minute flights. I've measured the full throttle current draw to be about 40 Amps, while the average draw over a typical flight is only 14 Amps. I routinely check the motor and battery temperatures when I land, and neither has ever been more than slightly warm, even on Houston summer days. Not bad for a low-buck system.

This was my first Model Tech kit, and I'm impressed with it. I've discovered that my opinion is shared with friends who have built other Model Tech ARF's. The problems that I encountered with the build were minor and easily overcome. The completed plane looks good and always gets positive comments at the field. Yeah, it's another Cub, but it's different and it's a good starting point if you like to customize, as I do. In the air I think the Super Cub flies like a Super Cub should, with nothing fancy and no character flaws. It's

very 'middle-of-the-road', which is exactly why I bought it. I've put in numerous flights now, and my opinion hasn't changed a bit. However, if anyone has ever finished one of these planes at the advertised 6.5 lb. minimum weight, I'd be interested to see the difference in flying qualities. Overall, I'm very impressed with this plane and I look forward to taking it to some big bird events soon.

(Photos by James Lemon)

Terry Dunn

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Readers Write

By Fred Herrmann

LiPo's... When you least expect it...

Forty years ago, when I started into the RC hobby, battery related problems were the number one cause of model airplane crashes. Forty years later, batteries are *still* the number one cause despite the remarkable advances in battery technology.

My first attempt at electric flight was in the late 1970's. I had a Graupner Cirrus glider that I equipped with two brushed electric motors, and pusher props mounted to the trailing edge of the wings. The flight times and weight weren't impressive, but it did work fairly well.

My latest venture was a conversion to electric of my 90" Jack Stafford B-24 Liberator. I flew the model using four .25 glow engines for the first time 15 years ago. I didn't fly it that much over the 15 years because of the trouble you had to go to for only a 3-minute flight. Then came the electric conversion and the relative ease of plugging up two 5000-mAh lipo's, which easily allowed for a calculated 14 minute "average" flight. I put more flights on the B-24 in 6 months than I did in the preceding 15 years. I configured the conversion to power the two inboard motors from one lipo and the outboards from another LiPo.



This last weekend I was out at the field, and thought that a few pictures of the B-24 would be nice. Perry mentioned that he had his Nikon and 200 mm lens with him, so I plugged up the B-24 and started doing some low photo op passes. After about 9 minutes of flight time, I noticed a sudden loss of power. I asked Perry, who was standing beside me, if he could tell whether or not the props were still moving? It looked like they were, and I throttled up a bit and decided to make "one more" pass. **Big mistake.** I sensed that something wasn't right, but gave in to the "media pressure" and started on the last pass.



Twenty seconds after I noticed the drop in power; I turned onto the base leg of my approach (which just happens to be in the direction of our local Amazonian Jungle). Seconds later, I turned away from the Jungle and onto the final; or should I say I tried turning onto the final? The plane stalled in mid turn, and gravity took over and planted it right into the middle of the jungle. I had sealed the planes fate. I was basically between a rock and a hard place. Push the nose down and hit the trees harder or have it stall in?



We hacked our way thru the jungle towards the locator beacons (read the ESC's beep every 20 seconds when they're at idle but still plugged up). We found the B-24. The plane itself was history, but the motors and electronics were basically untouched other than one broken APC prop. I brought the B-24 carcass back to the pits and powered up the motors. The soft cutoff kicked in on both batteries after only a few seconds. The 5000-mAh batteries were drained. But why? I should have had at least another 6 minutes of flight time on the lipo's.

When I came home I carefully inserted the lipo's into my fireproof lipo sack and started charging. Both 6-month-old 5000 mAh packs were in good health, but were fully charged after only about 3900 mAh.

Here are the lessons I learned:

- 1) First and foremost... if the plane is trying to tell you something; you need to listen. If you notice any change in a model's flight characteristics, no matter how subtle, you need to land ASAP. That loss of power I noticed were the ESC's doing a soft cutoff on the two inboard motors. By increasing the throttle I let the two outboard motors take up the slack, and simply drew more power from the remaining Lipo.

- 2) Don't assume that just because the Lipo has a 5000-mAh rating stamped on it that it will actually deliver that full capacity. I de-rated my flight time to 80% of capacity just to give me a reasonable safety margin and prolong my batteries useful lifetime. This was and would have been fine had the Lipo's actually had a 5000 mAh capacity. The only way you're going to get an approximate capacity from your Lipo's is to do a discharge at flight discharge rates. You have to consider that Lipo's, like other batteries, deliver less capacity at high discharge rates. Another factor is that Lipo's, like other batteries, have a life cycle degradation rate. Some of the "big name" manufacturers are stating upwards of 500 charge-discharge cycles before the capacity drops to 80%. I'm fairly certain that this doesn't necessarily apply to "all" lipo's currently available to modelers. Especially the lower priced lipo's. The other and last technical factor to consider is that Lipo's are stated to have a self discharge rate of ~5% per month. It wouldn't hurt to top off those Lipo's right before you head to the field.

- 3) Remember good old "Murphy"? Had the last two B-24 motors stopped 5 seconds later I would have simply dead stick'd her in onto the runway and I wouldn't be writing this article.
- 4) You're never too old to learn... even if it is the hard way...

Clear Skies,

Fred Herrmann

Photos compliments of Perry Hughey

Thanks for the article Fred. Sorry to hear of the failure!

**If anyone has a story for RCReport, send it on to
juliac@rcreport.net!**

Horizon Hobby's New Ultra-Micro P-51 RTF by ParkZone



34.6 grams of indoor and outdoor fun!

Advertised Wingspan: 15.8 in (401mm)

Measured: 16.0 in

Overall Length: 14.3 in (363mm)

Measured: 13.75 in

Flying Weight: 1.22 oz (34.6 g)

Measured: 35 grams

Motor Size: 8.5mm brushed motor (installed)

Radio: ParkZone with Spektrum 2.4GHz
DSM2 and Spektrum AR6400 receiver - installed

Servos: Spektrum 1.5-gram (SPMAS2000)

CG: 35mm from leading edge of wing at the
fuselage

Prop Size: 130mm x 70mm

Recommended Battery: 3.7V 120mAh Li-Po
(included)

Distributor:

Horizon Hobby, Inc.

4105 Fieldstone Road

Champaign, IL 61822
USA

Cost: Retail \$179.99 Street: \$129.99

CHEERS: Great looking with the performance to
back it up

Jeers: A little fast for indoors for a novice pilot

The Ultra-Micro P51 ARF is another tiny offering from ParkZone. This micro sized WWII P-51 is one of those ultimate “instant” planes. The “instant” means everything you need is in the box, so you can go to the hobby shop and then straight to the field!

The P-51 war bird design is known and loved, but this tiny little model has the full complement of full four proportional channels, but is only about the size of a ½ Racer! (Weighs less too!) Let’s have a look at what’s in the box.

The box has our Mustang secured very well in a fuselage saddle with two foam clamps securely holding everything still. We have a set of four dry cell batteries that go in the ParkZone 2.4 GHz DSM2 transmitter, and another set of four dry cells to power our mini single cell LiPo charger. Finally we have a single cell 3.7V 120mAh LiPo. The instructions are provided on several pages, but let’s face it, there is nothing to do except charge the single cell LiPo after installing the batteries in the transmitter and in the provided charger.



Photo 1: Everything needed to go fly

They even provide us with three additional pieces of hook and loop fastener for those extra batteries we will definitely buy.

The transmitter is labeled on the back with the procedure for binding the plane to the transmitter. To my surprise, the Mustang was not bound to this

transmitter, so I followed the instructions and the P-51 came to life when the battery was plugged in. The LiPo just sticks to the bottom of the P-51 in front of the would-be super charger inlet for the V-12 Merlin!



Photo 2: Humm...perhaps not!!

Now the little brushed motor produces quite a bit of power so I guess we should get off to the field, or a good sized gymnasium! I recommend starting outside first!!

Flying the Ultra-Micro P51 ARF

I managed to sneak out to our field early one afternoon and was not pleased to find winds of three to five MPH! Well I decided that it couldn’t be that bad, so some ground pictures were taken, and all was ready. I placed the Mustang on the runway and throttled up and off we went! The roll out was about 15 feet and then it happened....to quote an old TV series from the 80’s “to the moon Alice”... The Mustang climbed very steeply and I had to input all the trim that the transmitter had to settle the mustang down at full throttle. The elevator control was quite sensitive, as were the ailerons. I made several passes and decided that I would try out the low rate setting on the ParkZone radio. Yes, this little toy looking radio has a dual rate setting. The instructions tell us that we have two rates available to us, but there is no mention of the rate changes in percentages. I believe that we have about a 25% decrease in throw on low rates, so I tried that. A simple push down on the right stick yields a distinct click and now the power LED



on the transmitter begins to blink. A noticeable difference in flight characteristics on low rate and smooth flight is quite a bit easier. The Mustang loops and rolls a bit slow now, so I decided to go back to high rates and have some fun! I flew at full throttle the entire flight since I was battling the wind a bit, but I had a great time. I gave my Nikon D90 to Perry Hughey, a local club member, to get some in flight photos, so pass after pass Perry shot the Mustang with a frame rate of about 4 frames per second. After several passes, getting lower and lower, I heard Perry chuckle and start to laugh as he exclaimed, "This is like trying to shoot a gnat!"



A few times the wind gusted a bit and tried to pancake the little P-51 into the paved runway, but all went well and it was time to land. The little plane slows down quite well and with the under cambered wing the handling is still quite good. Simply get it low and chop the power and set it down. Don't try to get too fancy if there is a bit of wind, at only 35

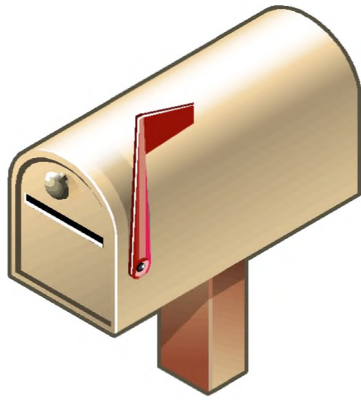
grams you can just dump it off in the grass and have no damage. Now for the fun part: indoor flying!!

A local company that I work for on occasion had moved into a new warehouse building. I have some electrical work to do there, so I loaded up and went to talk to my old friend Rick. I looked everything over and got a materials list together and planned when to do the job. Now time to get out the little Mustang. Rick is no stranger to planes like this because he has the Sukhoi Su-26m BNF by ParkZone. This Mustang has the same power system, just a different foam fuselage and wing. I brought the P-51 inside and proceeded to give her a flight. WEEEEEEEEEEEE!!!!!!! Man those roof support polls come up in a hurry. The Mustang flies decently indoors, but you need to use the high rate control throws, and much less throttle. The elevator trim needs to be reversed to allow the Mustang a high alpha nose high attitude with about 1/3 to 1/2 throttle to give positive and somewhat comfortable control indoor. Just remember that walls, lights and polls need to be avoided before you go kerplunk... I managed to hit a light fixture and the vertical stabilizer was broken off. A bit of clear packing tape works wonders!

I think the Ultra-Micro P51 ARF from ParkZone is just plain fun! The battery lasts about 4-7 minutes depending on your throttle control. The ARF version with the radio provided is a great lunch time flyer that you can keep in your work vehicle at all times. The cost at \$129.99 makes it available to almost anyone, and it can be flown by anyone that has graduated from a trainer into another low wing plane. Let's face it, everyone needs a P-51 anyway! There is also a Bind aNd Fly version for those that have a Spektrum or JR radio system!

Tony Coberly

Tonyc@rcreport.net



MAIL CALL

using, and despite its massive size it was only providing 4 charges of your pattern plane's batteries.

Dear Tony and Gordon,

I was very interested in latest issue page 79 on fireproof storage and the picture of the crockpot on Mark Shirell's letter to Gordon.

I am always interested in new ways to do things and am wondering if anyone has experimented with concrete blocks as charging containers and/or storage containers.

They are relatively inexpensive and available at Home Depot type outlets.

One thing I am curious about with a LiPo fire...is there much pressure generated and how much/what kind of venting is required?

If pressure containment is not a problem the flat and thin topping slabs for concrete blocks could be laid on top of the blocks for a seal.

Would very much appreciate your comments,

Dick Trebel

Tulsa, OK

Mr Trebel,

From Tony...concrete blocks would work well, but you would need a way for them to vent because the pressure will build up otherwise. (Tony's Note:How much pressure I cannot say, but I have seen a battery burst a piece of heavy duty shrink wrap.)The lid on his box has about a quarter inch gap between the lid and the base.

Julia

Tony,

I was reading a past column from you. It was a while back one of the final magazines in print. You were discussing a 115 ah deep cycle battery that you were

I was curious about what the size, configuration and capacity of those batteries you are charging? I have a deep cycle battery, (for some reason I think it is only 75ah) that I have hooked into my airplane hauling trailer. I have made several outlets for DC power, and charge Nicad and Nimh usually at rates of 1.5 amps or less. For maintenance I have a 15 watt solar panel attached to the battery that rides on top of the trailer. On a night before flying I will typically have three chargers running that will top off, and then trickle the fleet. Maybe a 4 or 4.5 amp draw total. But even after that, the battery still registers in the mid 12 volts.

I have been thinking about getting a Schumacher charger like yours, but so far, this seems to be working. But alas winter is coming. Short days, cold, and less solar charge time could be a problem.

I was just curious what causes your deep cycle to drain so quickly.

Dan Gellner

Klamath Falls, Oregon

Dan,

Well the main problem is I am charging 10 and 12 cells in series LiPo packs at 5000 mAhr Each charge yields about 210 watts draw for about 45 minutes to 1 hour. I have even recorded a temperature of 140 degrees F on the case of the deep cell battery as well. After four charges I can still charge my 10 S pack one more time, but at a very low 1500marh charge rate to prevent my

ThunderPower 1010C to fail due to a low input voltage condition. Deep, cycle batteries are made to be drawn down to a very low voltage condition, but repeated discharge at a rapid rate like this is simply hard on the battery. You must maintain the fluid level and charge it with a good quality charger.

Tony

Good to know Tony. What you are doing is so much more demanding on the battery than what I am using it for. My batteries are mostly 4, 5, 6 and 8 cell NiCads and NiMh, and for the most part I am charging them at C/10 so I don't have anywhere near the draw you are creating. (Unless I were to charge every single battery I have at a time) I occasionally charge a 3 cell LiPo for my little electric, but that would be at 1.8 amps.

Thanks for filling me in. I was wondering how you were knocking yours down so fast, where mine with the solar charger seems to be perpetually replenished.

Dan

SEND US YOUR QUESTIONS
AND COMMENTS SO WE
CAN GIVE YOU THE
INFORMATION YOU NEED!!

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Sparky's Revolt

By Tony Coberly

Well it's now time for Christmas and New Year's so I will start out by thanking everyone that has supported this new RCReport Online edition. I hope that everyone is blessed this holiday season, and continue to receive God's blessings in the New Year. After it's the reason for the season!

I have made the plunge into the deep dark world of editing. I will now be editing RCReport Online with the help of my wife Julia. I have not been doing enough with the magazine directly, so I made the decision to take it on myself. One thing about owning and now editing the magazine is that the labor can't come much cheaper!! I have never received a paycheck from the RCReportOnline since it started and that will not change for a long time to come. The money savings from doing the editing on my own will allow for improvements on the website in functionality and ease of use. I appreciate Gordon's help since April and I thank him for continuing to support RCReport Online with his monthly column. He ran R/C Report for more than 20 years, and I hope I can at least somewhat follow in his footsteps in the years to come. Enough about the business side, let's get into the hobby that we know and love so much!

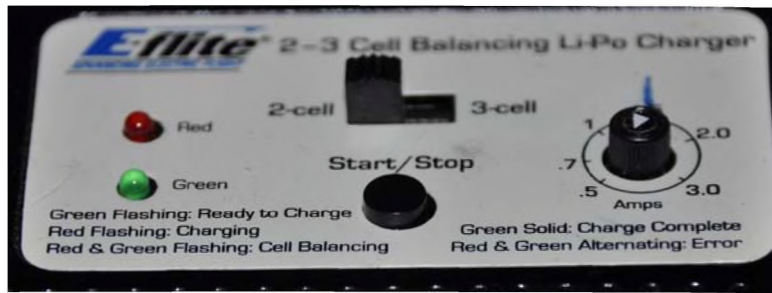
We have covered so much over these last months that I am not sure where to start. Well I guess that I'll look at yet another battery failure I had just a few days ago. I was building the E-flite P-40 Warhawk 300 ARF that I reviewed earlier in this issue. The recommended battery for this ARF is a 430mAh 2S 7.4V 20C LiPo, 20AWG JST by E-flite. This pack fits the very small fuselage opening very well, so that is what I used. Considering that most LiPo packs have about 50% charge when shipped, I used this pack for a few minutes for radio setup before actually charging it. Once the plane we setup

I decided to start the battery charging while I straightened up my shop prior to going to test fly. I did not have any of my primary chargers handy because they are all packed up in carry cases with my power supplies, so I reached for the charger that came with my Apprentice 15e RTF by E-flite.



Photo 1: Nothing fancy, I have used this charger many times with no problems

This charger is a balance charger that is adjustable for two or three cells LiPo and has a variable current rating from .5 to 3.0 amps. I simply hooked the charger up to a 12V power source and connected the balance tap of the 2 cell 430 mAh LiPo and set the current to the minimum setting of .5 amps. Now I was charging the 430 mAh pack at 500 mA. I have done this with other packs many times without a problem. If a 1C charge rate is .430 amps, then .5 amps is only 1.14C charge rate. This should NOT have caused a problem..... Notice I said should not...but there was a problem. I was in out of the garage over the next 45 minutes or so, when I heard a strange and unknown beeping sound. I decided that maybe I ought to investigate, and so I did. To my



surprise I find the E-flite charger beeping away with two lights alternating flashing back and forth with the melody of the beeping. The charger had my attention, so I started reading the top label where it describes what the flashing lights mean. It reads that red and green alternating means error. Ok, good to know, but what kind of error. Well a whole two inches away I see what kind of error. My two cell 430 mAh pack was now the size of my three cell 1000 mAh packs that I fly my combat foamy's with. There is no smoke or fire, and as I palpitate the pack, I realize that there is not any heat either. Very strange.

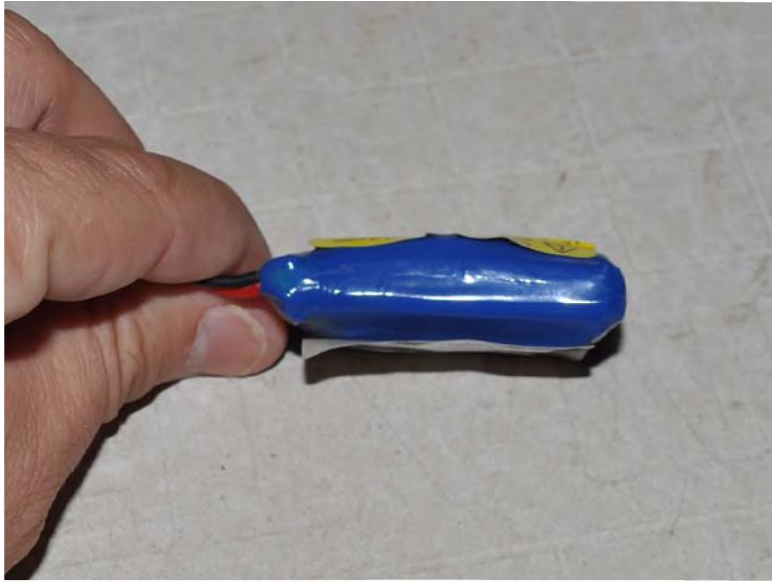


Photo 2: Notice the slight "Roundness"

Now I have a hard time believing that the ever so slightly charge rate of 1.14C would cause this pack to fail like this. It was a new pack, and I have since used the charger without a problem, so I can only think that I simply got a bad pack.

It makes you wonder exactly how many packs leave the factory. I mean if E-flite (or any LiPo battery pack manufacture) made 10000 of these batteries and they had ever a .5% failure rate in manufacturing we are talking about 50 bad packs.

That's only at one half of one percent. I wonder what the acceptable failure rate is these days for the large manufactures? 5% 10% More? Less? I'm sure we will never know exactly.



Photo 3: The failed pack is on top, and the good replacement pack is on the bottom.

Okay, so what am I driving at? Yes, I did charge the battery at a higher rate that it was supposed to be charged at. In my opinion if this pack failed on first charge with a rate of only 14%, then this pack was doomed to fail in the future, probably during first flight! I am trying to say that no matter how small the LiPo pack is, or how new it is or even how careful you have been while charging and discharging, they all can fail at any time!

Be careful and respect those LiPo packs and they will give you long life and many hours of flying pleasure. Disrespect them and they could burn your garage, shop or house down and even kill you!!

Tony Coberly

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