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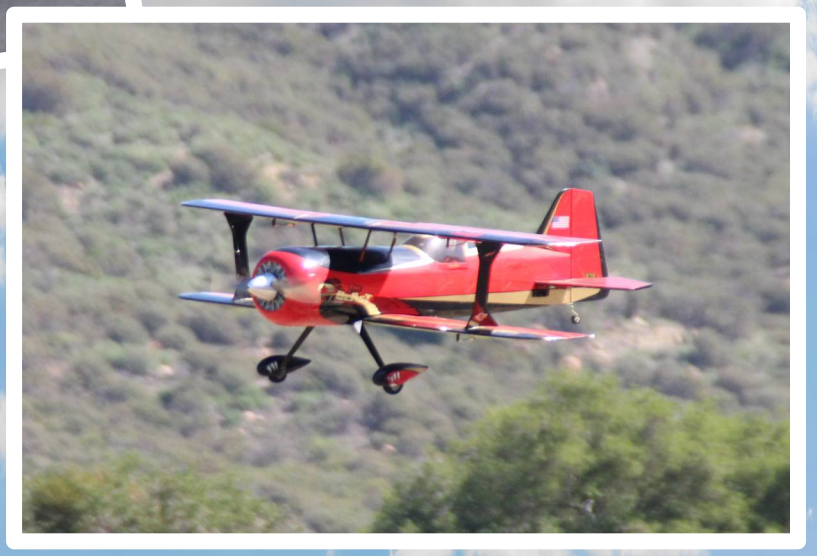
THE SCALE SQUADRON OF SOUTHERN CALIFORNIA

Founders of the US Scale Masters Championships

SCALE DIMENSION

Official Newsletter of the Scale Squadron of Southern California

Warbirds & Classics Update
Page 4



Founders & Proud Supporters of
The U.S. Scale Masters Championships

INSIDE THIS ISSUE

On the Cover

1. **Ken Blasius** performs a slow flyby with his unusual scratch-built **Cessna YL-15 Scout** observation plane.
2. **Jack Cannon's** brightly painted **Aero L-39 Albatros** about to set down after another excellent flight.
3. **Jerry Rice** turns heads on a high-speed flyby with his **Pitts S-12 The Beast**.

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EDITOR'S NOTES

Well, off we go into March! For the most part, the first couple months of 2022 have provided some excellent flying weather. There have been a few exceptions of course. Like the time we had a 25 MPH 90° crosswind that changed direction every 15 seconds or so. (You can ask **Steve Penn** how that worked out with his **Senior Telemaster**.) No matter what you fly, I hope you've been able to get out and enjoy the great weather.

Don't Miss the March Meeting!

You won't want to miss the March meeting where guest presenter **Merrill Brady** will talk about his 1:3 scale **Taylorcraft TG-6 Training Glider**. The model comes in right at 144" wingspan and, from what I hear, is a scale masterpiece. Merrill made plugs for vacuum-forming the canopy and other parts of this unique scale model. He used a lot of other techniques to simulate features of the full-scale glider on his model. He'll talk about how all that was done and answer whatever questions come up.

This is one meeting where you'll want to be there and not just read about it in next month's newsletter.

Larry Klingberg

You've probably heard by now that **Larry Klingberg**, life-long model aviator and enthusiast, AMA Hall of Famer, and lifetime Squadron member passed away at the end of February. Doing justice to Larry's life, his contributions to model aviation in general, and his impact on each of us individually would require an entire issue or two of the newsletter. So, on **Page 5** I've included a memoriam that reflects my association with Larry. If you have any memories of your own that you'd like to share, pass them along and I'll include them in future newsletters.

Warbirds & Classics 2022

Dates for the **2022 Warbirds & Classics** event have been finalized: **June 3-5, 2022** and planning is moving ahead. See the update on **Page 4** for details.

Eric Puchalski
Newsletter Editor

OCMA Swap Meet

No trips this month but I did get out to the **Bi-Annual OCMA Swap Meet** where I made out like a bandit! I was able to move some things out of my shop and made some terrific deals on some equipment, a new (for me) tool box, a couple tools to put in it, and some other odds and ends. Check out my report on **Page 9** in case you missed it.

Holes

We all spend a lot of time putting holes in things. I used to think I was pretty good at it in general, despite holes in balsa always looking like they were cut out by a three-year-old kid using a rusty ice pick. I remembered an article I'd read some time ago that had some solutions for things like that and I decided it was well worth sharing. Take a look at **Page 13**—maybe there's something there you haven't tried yet.

Winter Warbirds

The **Sun Valley Flyers** of Phoenix, AZ hosted their **10th Annual Winter Warbirds** event at the end of January. This is a world-class event for giant-scale military aircraft from all eras and all types. **Tim Cardin** attended the event and provided a bunch of photos that you can go through starting on **Page 6**.

Eric

roadkill1954@gmail.com

Warbirds & Classics 2022 is *ON!*

Plans are moving along for the 15th annual **Warbirds & Classics** event. The event dates have been finalized: **June 3-5, 2022**. We've got a CD (**Greg Stone**) and the AMA sanction is in-hand. Other planning activity is stepping up as well.

As restrictions on public gatherings have been reduced over the past year or so, attendance at model aviation events in general has increased in response. At last year's event just over 70 pilots registered with over 100 scale models of all types and sizes.

We're expecting an even bigger turnout this year.

In the past, Warbirds & Classics has been attended by pilots from all over the country. It is the centerpiece of Scale Squadron club activities and truly is one of the premier scale model aviation events on the West Coast.

Plans call for the traditional raffles, food concessions, T-shirts, and other activities and amenities. We will be reviewing plans and status at the next few Squadron meetings so make sure not to miss any of those.

Registration *will probably* remain at $40 per pilot and admission is still free for everyone else. There is no limit on the number of airplanes per pilot registration.

Requirements & Restrictions

Models must be representative of a full-scale prototype that actually flew at some time. Documentation is required for all aircraft but may consist of a single photo, drawing, or 3-view that proves the prototype existed. Turbines are not allowed but all other power systems are fine. Smoke systems are also not allowed. Drones are not allowed except those cleared by the CD for taking photos or flight demonstrations.

This is an AMA sanctioned event so current AMA membership and proper FAA registration marking on your model are required.

Volunteers Still Needed

We are always very short on volunteers. If you could help with any of the jobs that must be done with an event like this (parking, registration, ground and air traffic control, set up, take down, concessions, etc.) please contact **Mike Greenshields**. Even if you're a pilot, Mike is very good about scheduling so that your flying time will not be impacted.

Get Out There & Join Us!

If you have never attended Warbirds & Classics as a pilot, be assured that this is just about the most fun you can have in Southern California for only 40 bucks. The fact that a couple meals are kicked in just sweetens the deal. Even if you only show up for a look-around you'll be amazed at the number of models, the quality of construction, and the superb piloting skills that will be on display. If nothing else, it will serve as an inspiration to get you more involved in scale modeling.

IN MEMORIAM: LARRY KLINGBERG

by Eric Puchalski

On Monday February 28, 2022, Larry Klingberg passed away. He had turned 91 on February 27.

I first got to know Larry in 2013 and even though we didn't know each other for very long, we quickly developed a treasured friendship. I soon realized that making friends was one of Larry's super powers. He liked everyone and everyone liked him.

Larry began building model airplanes when he was 7 years old. Initially he learned the required skills from his dad. While serving in Korea with the Air Force he continued to build and fly models.

He developed a preference for flying models off water. He was very active in several aviation clubs and the annual Schneider Cup Reenactment events at Lake Havasu in the 1980's and 1990's. He almost always participated in a leadership position.

When it came to building model airplanes, there were no secrets with Larry. He was always happy to share knowledge of any kind. History, building materials, techniques, power systems, and pretty much anything else. If you ever asked Larry about how to approach a tricky problem, invariably, you would go away with at least three approaches, usually accompanied by a sketch or two.

Larry regularly attended the Squadron meetings, he *always* brought something for Show & Tell, and his presentations always included an interesting story. It's not surprising that, with his knowledge base and willingness to help, he published dozens of construction and how-to articles in several major national and international model aviation magazines.

Another of Larry's super powers was his ability to turn almost anything into a part for a model airplane. In his mind there was no such thing as "trash"; there was only "raw materials." Scrap 2x4's were ripped down to make stringers; foam board and Coroplast election posters became wing ribs; a child's tricycle wheel became part of a landing gear. The list is endless.

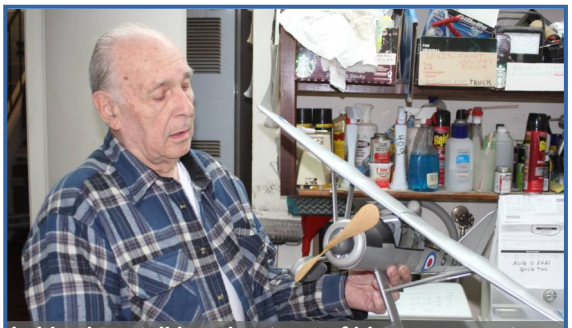
He absolutely loved to build LARGE-scale airplanes of little-known subjects. His standard approach was to start with a 3-view or sometimes just a photo and then get to work. He rarely used plans. "Drawings" consisted of an outline on brown paper taped to the bench. Then he would lay down the outside pieces and work toward the middle.

Larry was an enthusiastic ambassador for model aviation wherever he went and he always encouraged others to join in on the fun. He was a proud veteran, a terrific modeler, and an overall great guy.

Fair skies, Larry...

In 2016 Larry was inducted into the AMA Hall of Fame in recognition of a lifetime of contributions to model aviation.

Showing how it's done...


In his shop, talking about one of his more recent projects.

10TH ANNUAL WINTER WARBIRDS

by Tim Cardin

The **10th Annual Winter Warbirds** event, hosted by the **Sun Valley Flyers** of Phoenix, AZ, occurred this past January 27 through 30. The event was held at the club's field at Cave Buttes Recreational Area which boasts a 600' x 60' paved runway.

This annual event is open to all military aircraft of any type from WWI to present day and all power systems are allowed. Most models are giant-scale and some *very* impressive aircraft were on hand. Both static and performance awards were presented.

By any measure, the event was a terrific success. SVF hosted 96 pilots from eight states and Puerto Rico with easily 200 aircraft of all types for four days of giant-scale warbird flying. Everything from WWI to jets and turbine helicopters all got along and played nice together.

The weather was perfect all weekend and there were no airplanes in the trash cans after the flying was complete.

Winter Warbirds is a world-class event that draws five-star pilots and aircraft as well as major hobby industry sponsors. Many of the aircraft and pilots are Top Gun participants including a number of past Top Gun winners flying incredibly detailed scale aircraft.

Sponsors included **Desert Aircraft**, **Horizon Hobby**, **House of Balsa/Zap**, **Global Jet Club**, **Bad Boyz RC**, **BVM**, **Legend Hobby** and others. A dozen **Horizon Hobby Team Pilots** were on hand flying demos and helping pilots.

While all that may sound a bit overwhelming, the event is actually quite low-keyed. All the activity is structured around spending a few days flying with friends at a premier flying site in a stunning Arizona landscape. The emphasis is on flying, incredible people, aircraft, and hospitality.

Take a look at the accompanying photos and start making your plans for next year!

A couple drone shots from Saturday afternoon with the event in full swing. This will give you an idea of the scope of the event.

Wall to Wall heavy metal. It's difficult to show the scale of the models and the event, this is looking at about 300' of pits including 6 tents at the end.

10th Annual Winter Warbirds

That's the view from my chair. The F86's below the windsock have 10' wing spans. The F16 in the foreground belongs to Spencer Cody, a local FedEx pilot.

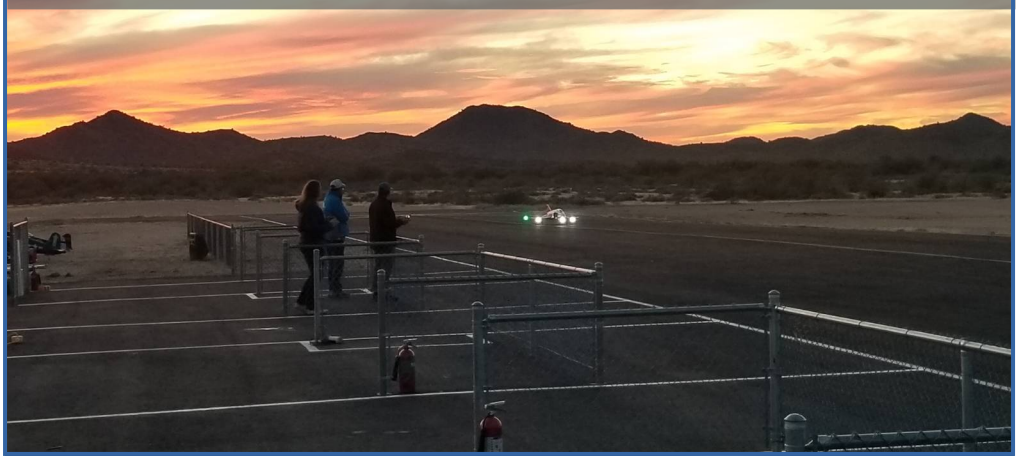
Inside Brian O'Meara's tent - This is a 20'x40' Tent. The Skymaster F86 has a 10' wingspan. The Thunderbolt is a 1:4 scale (140" wingspan) powered by a 500cc 4 cylinder. The A10 Thunderbolt is huge but doesn't look like it here. Impressive by any standards.

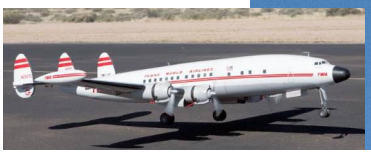
Mike Adams and Ken McSpadden Flying F4 Phantom and an F4U Corsair in formation – smoke on!

10th Annual Winter Warbirds

Ali Machinchy and Tony Quist flying Hangar 9 OV10 broncos in close formation.

Mike Adams beginning his take off roll with his Skymaster F4 Phantom for a sunset Flight.





OCMA SWAP MEET

by Eric Puchalski

The **Bi-Annual OCMA Swap Meet** was held Saturday, March 5 from 7:00am to 11:00am at OCMA Field. As it happened, it was a perfect day for the event. It was a bit on the chilly side and the sun only made an occasional appearance. But there was no rain and not a lot of wind. All told there were about 30 sellers with everything from complete airplanes to unassembled kits, to bits and pieces of planes and the equipment needed to support them.

Don't let the photos fool you—I was having so much fun buying, selling, and haggling that I completely forgot to take any pictures until I realized that about half the sellers had pulled up stakes and moved on to warmer climes.

Like you, I find myself picking up odds and ends that maybe I can use but, all too often, much of it ends up collecting dust in the back of a drawer somewhere. So early Saturday morning I filled the back of the truck with airplanes, tools, equipment, and some other stuff and headed to the field. I paid my five bucks to **Greg Stone**, set up a couple tables, and got down to business. As with most times when I attend a swap meet to sell things, I went home with about the same number of items—but the stuff I took home was different from the stuff I brought out to sell. I ended the day a little on the plus side as far as my pocket change so it was well worth the trip for me.

I don't like to brag (much) but I *will* say that I scored some amazing deals. **Photo 4** shows a set of **E-flite** electric retract mains I was able to get for only $15.00 for the pair. Also note the vintage **Veco 61** that only set me back $5.00. OK, the Veco needs a little TLC and a couple parts but all the hard-to-get bits are there and MECOA has the parts that are missing.

One very nice thing about these swap meets is that since they're attended by modelers, virtually everything you look at is a conversation starter. I met several guys who have been modelers for decades right here in Orange County. It was great to reminisce about the old days with guys who were going through it at the same time I was.

If you weren't able to make it, the photos will give you an idea of what you missed. All in all, this was a terrific event and I was glad for the opportunity to move some stuff from my shop to other good homes while filling some gaps in the list of things I need. I only hope that OCMA decides to do this every year instead of every other.

Photo 1: A small sample of sellers making buyers happy... and vice versa.

Photo 2: There was a little bit of everything...

Photo 3: ...and something for everyone.

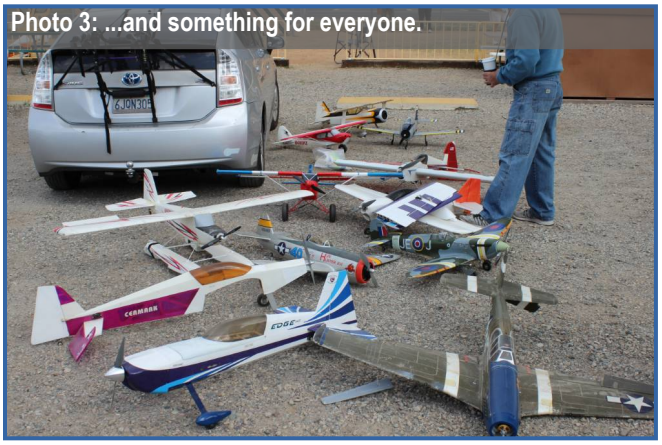


Photo 4: Vintage Veco 61 & E-flite electric retracts. Total investment: $20.00.

DIY DEAD CENTER TOOL

by Eric Puchalski

Once again, I found myself in need of a tool which I own but seem to have misplaced. Way back in the day, **Great Planes** offered this really cool device called a **Dead Center Engine Mount Hole Locator** that did a terrific job of locating holes for engines, servos, and anything else that needs a mounting hole. As you might guess (since it was produced by Great Planes) it's no longer available. You can still find them online as NOS for anywhere from $9.00 to $15.00 plus a usually ridiculously inflated shipping charge. Through an odd sort of serendipity, I found myself with one of these tools in hand, but it belongs to a friend of mine. So I did exactly what most of you would do and determined to *not* pay around 10 bucks plus shipping for something I can make myself. I took a couple quick pictures and decided to make one to replace the one I can't find.

Photo 1: An original Great Planes Dead Center tool.

Photo 2: Using the tool to locate a mounting hole.

Photo 1 shows what is I'm going to try to replicate and **Photo 2** shows how it's used.

The heart of this tool is a 1/16" drill bit riding inside a brass tube that has a small funnel-shaped tip that centers the drill bit in the mounting hole of the item being mounted. The 1/16" bit can then be extended and twisted by hand to provide a mark at the exact center of the mounting hole. The drill bit in the Great Planes prototype is 6" long and everything is built around that. I found a couple sources for 6" long, 1/16" drill bits but they run about five bucks each plus shipping. Total would have been close to $10 (assuming I had everything else on hand), so no money savings to be had there. I had a couple spare 1/16" jobbers-length bits (around 2-1/2" long) and I figured I could make one of those work.

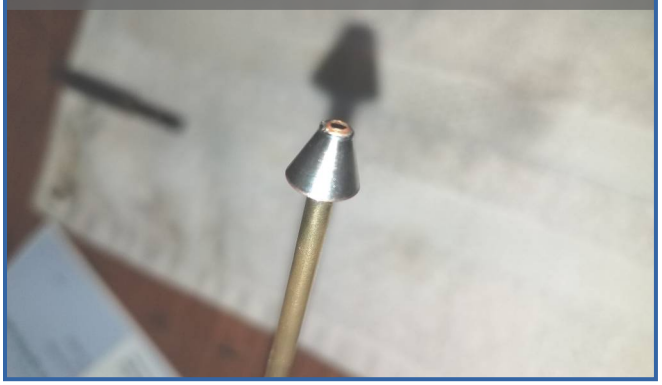


Photo 3: Centering tip soldered to 1/8" copper tubing.

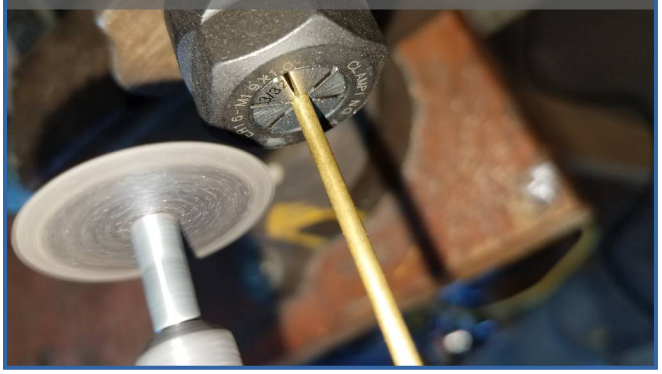


Photo 4: Cutting two 3/32" tubing for splicing the 1/16" drill bit to the 1/16" piano wire.

Round Up the Parts

First, I gathered up the parts I thought I'd need. This included the following:

- 1 x piece of 1/8" brass tubing longer than I needed (around 10") for the outside housing
- 1 x piece of 3/32 brass tubing (needs to slide freely inside the 1/8" brass tube)
- 1 x .062" (1/16) jobbers drill bit
- 1 x piece of 1/16" wire (piano or soft, it doesn't matter)
- 1 x spring from a broken (or not) retractable ball point pen
- 2 x knurled knobs
- 1 x 6-32 set screw to hold one of the knurled knobs in place
- 1 x metal tip from a retractable ball point pen that didn't work anymore since I had taken the spring out.

For the knurled knobs I used a couple stick tips from an old transmitter but wheel collars or anything else will do as long as you can get a grip on them.

Process

I started by drilling out the hole in the ball-point pen tip to a slightly smaller diameter than the 1/8" brass tube. It turns out a #31 bit is .020" diameter which, after accounting for wobble of the hand-held drill motor, provided a nice press fit for the 1/8" tubing inside the pen tip. Then I soldered the pen tip to the 1/8" tubing (**Photo 3**).

Since I didn't start with a 6" long 1/16" drill bit, I had to lengthen the one I had. I decided to use 3/32" tubing (which has a 1/16" ID to match the drill bit and a 3/32" OD to match the ID of the 1/8" tubing) to splice the drill bit I had to a long length of 1/16" piano wire. I cut a couple short lengths of 3/32" tubing, one to connect the 1/16" drill bit to the 1/16" piano wire, and one to act as a bushing for the piano wire inside the 1/8" tubing at the top end (**Photos 4 & 5**). A little more soldering, cleaning, and minor adjustments and I had the drill bit nailed (**Photo 6**).

Then I had to modify one of the knurled transmitter knobs to fit the 1/8" tubing and one to fit the 1/16" piano wire for the twist drill. I wanted a press fit onto the tubing so, again I used a #31 bit to make the 1/8" tubing a press fit into the transmitter knob (**Photo 7**). For the other knob, I drilled a 1/16" diameter hole through the knob.

The last bit of "machining" required was to install a setscrew in the transmitter knob that would be used to twist the drill bit when marking the mounting hole. This required a little bit of drilling and tapping (**Photo 8**) to provide a happy home for the setscrew (**Photo 9**).

That all left me with some parts to be assembled (**Photo 10**). Everything required a little tweaking, bending, trimming, lubrication, and final assembly. **Photo 11** shows the prototype tool next to my copy and **Photo 12** shows the new tool in use. Heck, I even found an old cigar tube to store the thing (**Photo 13**).

All in all, I'm very happy with the way this turned out and that I was able to produce it using things I had lying around the shop. I spent about three hours total (including a couple false starts on one of the parts). I know I could have dropped $15 or $20 and purchased something from eBay but this kept me off the streets and out of those dingy pool halls for a few hours, so why not?

Now I gotta run. I *know* I have an engine that needs mounting somewhere...

Photo 5: Parts to make a 6" long 1/16" drill bit, ready to be soldered.

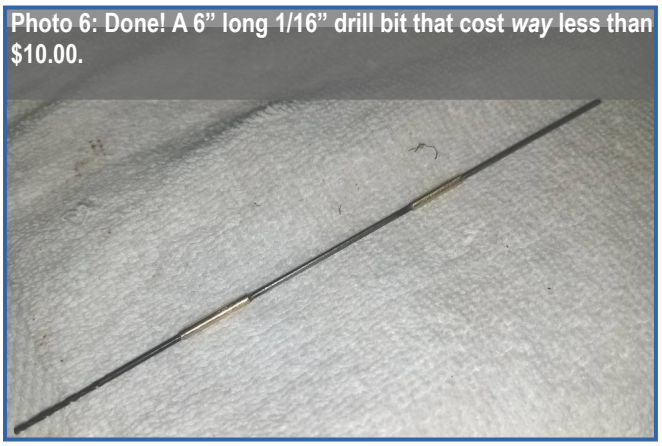


Photo 6: Done! A 6" long 1/16" drill bit that cost *way* less than $10.00.

Photo 7: Completed tool housing.

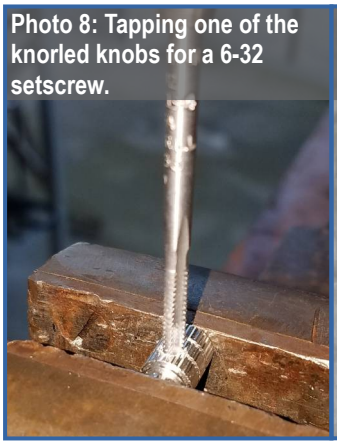


Photo 8: Tapping one of the knorled knobs for a 6-32 setscrew.

Photo 9: Setscrew installed on knurled knob for drill bit.

DIY Dead Center Tool

Photo 11: Here's my version compared with the prototype.

Photo 12: Using the new tool to mark a hole location.

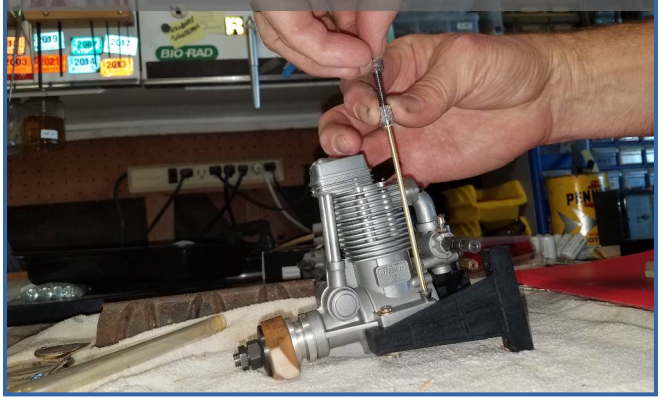


Photo 10: Ready for final assembly.

Photo 13: Looking like the real deal in its cigar tube for storage.

OCMA Field Rules – Rule 2C(m) on Calling Park Rangers Before Retrieving Models

The OCMA Field rules serve two major purposes: Compliance with OCMA's agreement with the **Orange County Department of Parks & Recreation** and safety (pilots, spectators, wildlife, and equipment). The rule highlighted this month falls squarely into both categories but there's a very simple way to comply: *Just call the park rangers if you have to go outside the flight zone area*.

Rule 2C(m): *If you need to retrieve a downed aircraft outside our flight zone area, you must notify the OC Park Rangers by calling* ***714-973-6696****.*

Applies to: Anyone operating any aircraft in any are of the field: fixed wing, rotary-wing, and drones.

Purpose: There are a few reasons for this rule: First, none of the property outside the flight zone area is governed by agreement between OCMA and OC Parks. Therefore, if you go outside the flight area, you're trespassing. Second, the entire canyon is home to all kinds of wildlife including rattlesnakes, bobcats and the occasional mountain lion. You don't want to run into one of those unexpectedly on their home turf. Third, on hot days you'd be amazed at how quickly you can become dehydrated to the point that you can no longer get yourself back to the pits. In the first instance, we must be respectful of property that we're not authorized to use. In the second two, if no one knows you're out there in the brush, no one will think to come help you.

Consequence: Ignoring this rule can have multiple consequences. Worst case, you die from a snake bite before anyone realizes you're gone. Otherwise, if you're caught trespassing and the property owner decides to prosecute, you or OCMA can be sued and OC Parks can decide to simplify their lives by removing OCMA from the field entirely.

Penalty: Repeated verbal warnings about violations of this rule can result in the loss of field privileges for the person ignoring the rule. Field Safety Officers are empowered to retrieve the OCMA member card and key from anyone who repeatedly and intentionally ignores this rule.

HOLES: A MODELER'S GUIDE

*[**Ed. Note:***

While cutting ribs for my Fw 190A-8 project, I found I needed to put some holes in the wing ribs for electrical, retract plumbing, and just general lightening up of the framework. The ribs are 1/8" balsa and I quickly ran into the age-old problem of the balsa splintering when the drill popped out the back side. This has long been a frustration of mine because as I've mentioned before, I'm a believer that craftsmanship is built in from the inside out. I've been drilling messy holes in balsa for decades and my initial attempts this time were no exception. They were serviceable and would never be seen by anyone besides Larry and me but it seems like there must be a way to get cleaner results. This seemed like a good time to improve my game by finding out if there's a better way to do this seemingly simple task.

*I recalled that while rummaging through some old magazines I'd once seen an article that addressed just this problem. So I went through my article clippings and voilà, I found the solution! The following article is taken from the **October 1993** issue of* **Model Aviation** *and was written by **Ned Kragness**. It describes in very simple terms why things like splintered and out-of-round holes happen, and what you can do about it.*

Ned's original article was pretty long, included some areas not related to putting holes in things, and references some sources that are no longer around. So I've edited it a bit to focus on holes and mention current sources.

I hope you find this as useful as I have.]

Holes: A Modeler's Guide to Selection & Use of the Proper Tools for an Important Construction Step

by Ned Kragness

Building a model is an exercise in cutting and shaping bits and pieces to be assembled into the final product. To assemble the model properly, builders spend a lot of time and energy making holes.

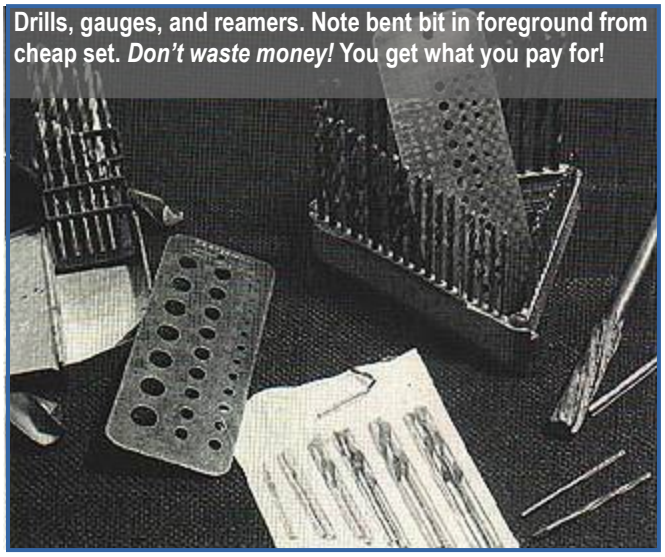
The technique for making boles varies according to the size and shape of the hole and the material into which it is being cut. Modelers must learn to cut specific holes into specific materials.

Regardless of the shape of the hole, begin by drilling an aperture that is basically round. Even if a large, irregularly shaped cutout is what you're after, you should still draw the initial hole basically round and pass a jigsaw blade or file through it to work it to size and shape from the inside.

If, however, you want the hole to be smoothly cut and precisely located and sized, there are a few extra steps that should become automatic.

All too often, when we want a 1/4" hole, we reach for the 1/4" jobber's drill. *Don't do it!* Good holes are produced by starting small—at least, smaller than the desired dimension. You'll understand why as you read further.

To accurately locate the hole, draw or scribe the centerlines to extend beyond the edges of the desired hole and make a punch mark where they cross **(Photo 1)**. The locator lines will remain after the punch mark is gone. This will help when positioning the drill to start the hole.



Drills, gauges, and reamers. Note bent bit in foreground from cheap set. *Don't waste money!* You get what you pay for!

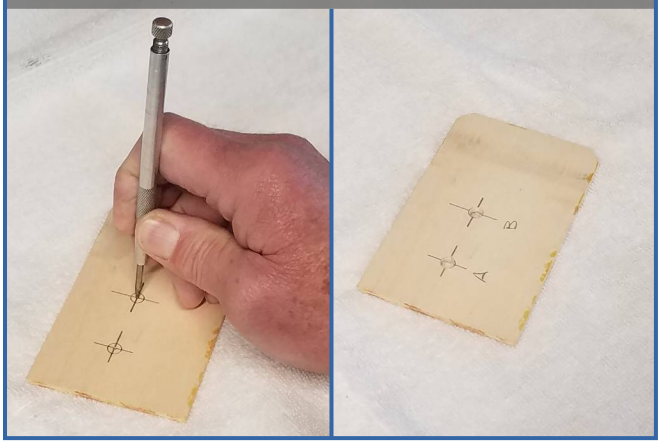


Photo 1: Use a center punch and a large enough guideline that part of the guideline will remain after drilling.

Holes in Wood

Holes drilled in metal usually have smooth inner walls and fairly clean edges. Wood fibers, on the other hand, tend to tear rather than cut cleanly. Therefore, holes drilled in wood will be rough, with splinters and splits. Splintering is worst where the drill has exited, because the feed pressure pushes the last, weak, unsupported fibers out of place before the cutting edges have a chance to work **(Photo 2)**.

This splintering at the exit point can be prevented by placing a piece of scrap wood snugly against the underside of the surface being drilled. When the drill point enters the scrap, the fibers around the center cannot bend or break, so they cut neatly **(Photo 3)**.

Wood-grain fibers tend to deflect the drill off course. The drill follows a path between the strongest fibers, and the hole drifts. This is another reason for drilling undersize.

For example, if the intended 1/4" hole is made with a 1/16" jobber's (or fractional) drill and drifting is discovered, we can correct most or all of the error by using a small, round file to enlarge the hole toward its intended location before redrilling.

These small, round files (whether rat-tail or round "bastard" type) generally taper slightly and can be used as tapered reamers.

Photo2: Typical result of drilling unsupported wood.

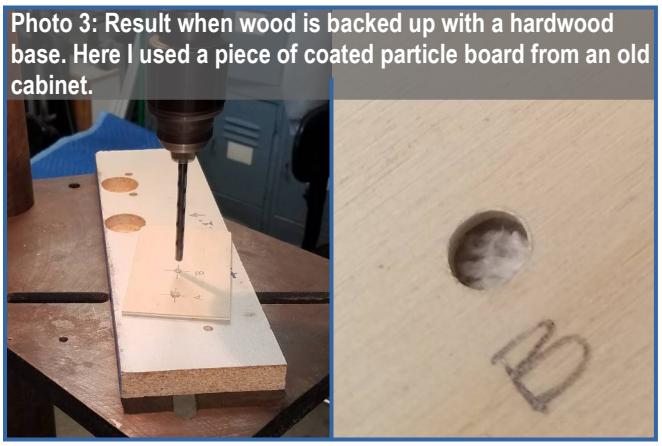


Photo 3: Result when wood is backed up with a hardwood base. Here I used a piece of coated particle board from an old cabinet.

Twist Drills

A twist drill will come in handy. To understand what a twist drill can—and can't—do, let's examine one closely **(Figure 1)**. First, notice that the twist drill lacks a true point. Instead it has a small chisel tip, the edge of which is crosswise to the drill—or dead center. The chisel tip must be forced into the piece being worked on or the drill may wanderer or skate, and the chisel will only scrape the surface.

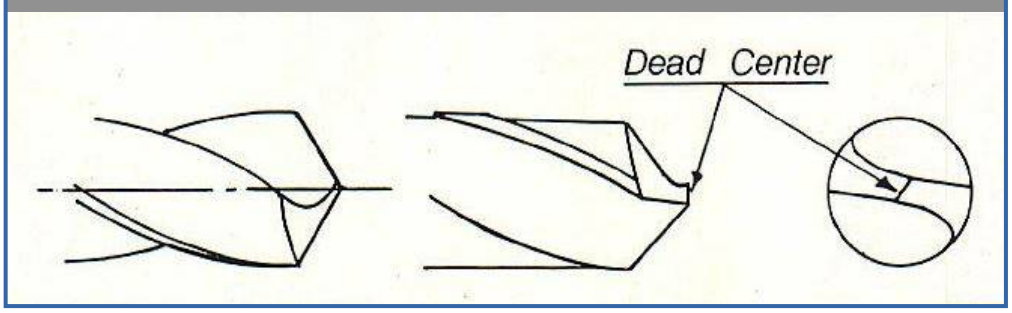


Figure 1: Twist drills don't have true "points." Instead, they have chisel tips with edges crosswise to the cutting edge of the drill.

That's why it's important to make a center-punch depression. It should be large enough to admit the entire chisel, so the cutting edges can begin to work while the drill is held in the punch crater.

If the material is too fragile to withstand a heavy punch stroke then make it a light one and start with a smaller drill. Then begin enlarging the opening until it's ready to accept the larger drill dead center. Remember, smaller drills have smaller chisels.

The cutting edges of a drill are almost invariably of unequal length. If you've ever sharpened a drill, you understand these limits to precision. Drill sharpening is never exact and drills always make holes that are larger than their nominal size. The longer edge sweeps through a greater diameter and the feed pressure actually bends the drill, forcing one cutting edge to make a heavier cut and again sweeping through a larger circle.

Reamers

Precision holes can still be made, however. The trick is to drill a few thousandths of an inch undersize and then ream to achieve final diameter.

Reamers make cuts on the side walls of the hole. The straight flutes are usually given a very small taper at the entry end so they can enter the undersized drill hole and gradually begin the heaviest cutting. Since each flute is made entirely of cutting metal, the cut must be shallow enough to prevent the twisting forces from increasing to the point that they break the tool.

Reamers are available with either

straight or spiral flutes. Since the flutes of a twist drill are similar to those of a spiral reamer, we can ream with a twist drill, provided we remove only a few thousandths of an inch at a time. Whether you use a reamer or a twist drill, hand turn the tool in one direction only, both going into the hole and coming back out.

Don't try to enlarge the hole diameter more than 1/64" at a time. There's a lot of cutting edge at work, and good tools are expensive—and brittle, because they're hard. Use a lubricant when reaming metal.

When drilling or reaming deep holes, remember that chips will fill and clog the flutes. Withdraw the reamer or twist drill from the hole and clear the flutes to prevent jamming and breaking the tool.

Working With Thin Metal

Drilling thin metal is another thing altogether. We'll define thin metal as anything thinner than half the diameter of the drill. Difficulty arises because the drill removes its own central pivot bearing before the cutting lips and flutes have penetrated far enough into the metal to be supported by the cylindrical portion of the hole.

One of the lips hooks into more metal than the other, and the drill deflects or wobbles the work piece. The drill bends, breaks, or if we're lucky, produces a star- or keyhole-shaped hole surrounded by burrs.

Again, we can prevent this by making sure the piece is solidly backed with scrap. This will hold the drill point centered until the flutes have penetrated the metal. The scrap may be clamped, tack soldered, or secured with cyanoacrylate (CA) glue so it holds the entering drill point in position.

It's best to produce holes in thin sheet metal by punching first, then enlarging them by reaming, fretsawing, or nibbling. A nibbler is a small punch-and-die mounted on pliers-like handles. Insert the punch-and-die through a hole, and punch the metal away bit by bit. **Photo 4** shows a nibbler made by Bernz but there are many other brands out there. A nibbler can cut holes of any shape in plastic, fiberglass, aluminum, and other materials. Plastic and fiberglass can be up to 1/8" thick. But it's not a good option for thicker, harder materials.

Twist Drill Sets

Twist drills come in sets. Most commonly seen is the **jobber's drill** set. which is graduated in 1/64" diameter steps. **Number drills** are coded by whole numbers and are usually sold in two groups: 1 through 60, and 61 through 80.

Letter drill sets (A through Z) and metric sets are also available. Neither the number nor the letter sets are uniformly graduated. Modelers use factional and number-coded drills almost exclusively.

Don't buy the most inexpensive drill sets! If you look at a good-quality set first, you'll see the difference. You should have a set of jobber's drills (fractional) ranging from 1/16" through 1/4" in 1/64" increments. Good-quality drills are available in carbon steel and high-speed steel. The latter are useful mainly in machine shops and in drilling stainless steel; they're much more expensive.

Other Hole Tools

A set of **jeweler's broaches** (**Photo 5**) is useful and inexpensive. A jeweler's broach is tapered much like a needle, but since it is ground to a five-sided cross-section, it has five sharp edges.

You can make a disk or hole cutter for thin sliced balsa by **sharpening a piece of tubing** on one end. Cutting is done more by rotating than by punching, So the cutting edge should be toothed rather than being razor sharp. Either brass tubing works best but aluminum tubing can also be used if you nick the end with an old razor blade to make a lot of little teeth.

Drilling for Machine Screws

Now that we've learned to make neat holes, it's time to consider what to put in

Photo 4: Typical nibbling tool used to make holes in thin sheet metal & other materials.

them. Let's begin with machine screws. If you're going to use screws, the holes should be threaded.

One reason for the wide range of drill sizes available is that holes must be drilled precisely enough that they can be tapped—that is, threaded. For threads to be cut, some metal must remain in the hole. For example, a 2-56 screw will slip into a #4 (.086" diameter) drill hole. To thread the hole with a tap, a #50 (.070" diameter) hole should be drilled.

As noted earlier, threading is done with taps. Taps are hard steel screws with flutes to create the cutting edges for the thread teeth and to accept the chips produced in cutting. For each tap size, there's a specific, corresponding drill size. Using the right size drill will ensure that enough metal remains in the hole for threading.

Screw the tap into the hole, and rotate it back and forth to prevent jamming and breaking. Remove the tap entirely from the hole to clear it of chips. Use a lubricant, except when working with brass or cast iron.

With the many kinds of small screws, washers, and nuts that are available, the size of the fasteners used can be reduced to dimensions that are approximately scale. Small fasteners are made for use in instruments and other compact devices, like eyeglasses, that usually have two small screws that attach the earpieces to the lens frame.

Small screws are surprisingly inexpensive and the corresponding taps and dies are available from a number of sources. You should consider gathering a set of taps and dies for each of the thread sizes, whether Metric or SAE, that you most commonly use. You'll also need the correct drills for those taps. This collection will cost you a few bucks, but it will last for many years. If you're having trouble locating very small taps and dies from your usual sources, try looking at dealers of tools for clock repair or model railroading.

The small machine screws come in several head styles—hex, flat, round, etc. and they look particularly attractive on scale models.

Using Screws in Balsa

Small machine screws are also surprisingly strong in wood—even balsa. The trick is to harden the wood with thin CA. Drill the wood undersize for the tap drill, and apply the CA to the inside of the hole.

When the glue has thoroughly cured, redrill to the tap drill size. Treat the hole with glue again, redrill, and then tap as if for a metal hole. You'll be surprised at how strong and positive the fastener becomes. One caution: Be absolutely certain the glue has cured, or you'll end up permanently installing the drill or tap!

Photo 5: Jeweler's broaches come in many sizes and are especially useful for making small holes perfectly round.

Conclusion

There are, as they say, many ways to skin a cat. This article touches on a few of the most common and practical ways of getting holes in the things we use when constructing our models. We've all developed methods that get the job done (most of the time). By applying some of these methods you should be able to regularly produce nice looking precision holes exactly where you need them.

Jerry Rice flew his **Pitts S-12 The Beast** and put on quite a show. This is a 60" **E-flite** model with a **Power 90** motor. Jerry has owned this plane for about 10 years and still loves to fly it. What made this flight "interesting" was that Jerry said the plane was set up for 3D but he had no gyros. That combination made for a pretty touchy airplane and some rather exciting moments.

Ron Pearson brought out his neat little **E-flite Stearman N2S**. The N2S is the Navy version of the **Army PT-17** but both the N2S and PT-17 carry the "Kaydet" nickname. Ron has owned this model for around six years and he still likes it a lot. The only thing he's had to replace is the landing gear. The plane is powered by a 3-cell 3,000mAh pack that provides about six minute flights.

Jack Cannon has owned his **Freewing Lockheed T-33 Shooting Star** painted in German Luftwaffe colors for about three years. The model spans 53" and is powered by an 80MM EDF which moves it along at a *very* fast clip. Jack is very impressed with the overall quality of the model and included details. He says it's one of his absolute favorite airplanes.

No, it's not a scale model but it sure was fun to see the **OC Fire Authority** practice their water drops. The **Bell 412EP** is the mainstay of the OCFA and this one is equipped with a 375 gallon water tank and a system that can tap into the municipal water system for filling the tank. As always, flight operations at the field were stopped but it was worth it to watch these guys do their stuff.

Look carefully at the back seater...

Monday
March 14, 2022
7:00pm

The March 2022 Meeting is On!

The March meeting will be at the usual place and time. This month we have a special guest speaker: **Merrill Grady** is bringing his 1:3 scale **Taylorcraft TG-6 Training Glider**. The full-scale glider has a 36' wingspan so the model is right at 12' making it an impressive scale project. Merrill made plugs and vacuum-formed the canopy and other parts of this unique scale endeavor. You won't want to miss this month's meeting!

Remember that visitors are always welcome so don't be shy about bringing someone. And remember that anyone with *anything* for **Show & Tell** will receive a raffle ticket for special prizes to be raffled off at the Squadron Annual Banquet in December.

Meeting location is the **Green Valley Adult Clubhouse**. The address is:

17250 Los Jardines West
Fountain Valley, CA 92708

Directions from the South:

- From **I-405 North**, exit at **Euclid**
- Turn **Left** onto **Euclid** at the offramp
- Turn **Left** onto **Slater**
- *Go **past** Los Jardines East*
- Turn **Right** at the light onto **Los Jardines *West***

The Clubhouse is on the right about a half block past the school on the left.

Directions from the North:

- From **I-405 South**, exit at **Brookhurst North**
- Merge onto Brookhurst and turn **Right** onto **Slater**
- Turn **Left** onto **Los Jardines West**

The Clubhouse is on the right about a half block past the school on the left.

UPCOMING EVENTS

Special Note Regarding Events

A list of upcoming scale events that are easily reachable from Southern California is included here. We encourage everyone to participate in as many of these events as possible in order to show support for clubs that have gone through the same difficulties that the Scale Squadron has experienced recently. Remember that when you attend any of these events, ***you are an ambassador of the Scale Squadron.*** Be sure to mention your affiliation with the Scale Squadron and represent us well! (Also, bring back lots of photos and get them off to **Eric Puchalski** so they can be included in the next newsletter.)

Date	Host & Location	Event & Summary
Mar 18-20	**One Eighth Air Force** Mesa, AZ	**Gunsmoke 2022** Overnight parking available Thursday - Saturday night, call to reserve a spot. Trailers can be left overnight, security by club. All classes will be judged. $40 entry. Static Friday - Saturday AM
Apr 8-10	**Tri-Valley RC Modelers** Santa Maria, CA	**2022 Wings Over Arizona** Scale fly-in. Pilot fee: $40 for all 3 days. Parking $6.00/car. RV dry camping (reservation required, contact CD). Food vendors available for lunches. Dawn Patrol Saturday 7:00am-8:00am for military and pre-1939. Night Fly Saturday 6:00pm-8:00pm for models with lighting.
June 3-5	**Scale Squadron** OCMA Field	**15th Annual Warbirds & Classics** World-famous scale fun-fly. All types and sizes of anything that looks like a model of a full-scale prototype (no turbines or drones). $40 pilot fee for any number of models. RV dry camping available with reservation.
Jul 27-31	**Tri-Valley RC Modelers** Santa Maria, CA	**Central Coast Giant Scale Fly-In** Giant Scale ONLY until 1700. Jets & 3D OK. Landing fee $30 (includes pilots raffle & lunch on Sat) Dry camping $10 per night. 500 x 50 paved runway, shade canopy, power available in the pits. Santa Maria style BBQ Sat eve. Pre-reg requested.
Oct 19-23	**Arizona Model Aviators** Superstition Airpark, Mesa AZ	**2022 US Scale Masters Association Championships** Details on this event are a little sparse right now but there should be more information as the event gets closer.

Errors & Omissions:

If you note any errors in any information in this list or the flyers on the following pages, please contact *Eric Puchalski* or any of the members of the Scale Squadron Board of Directors. If your club is hosting a scale-themed event that's not on this list, contact Eric to get the event added to the list. If you have flyers, an informational website, or online registration page we would be happy to include that in this section as well.

GunSmoke 2022

A Scale Masters Qualifier

Hosted by the One Eighth Air Force March 18, 19, 20, 2022

F4B

Competition in 5 classes
Expert, Team Scale,
Advanced, Pro Am Pro,
Pro Am Sportsman

++++++++++++++++++++++++

Friday: Static Judging
10AM to 3PM
Late Arrival Static Judging
Saturday 8:00 AM.
Sat & Sun: Flight rounds
8:30AM to 3PM

++++++++++++++++++++++++

Awards Ceremony Following the Flight Rounds
Sunday
Entry Fee: $40
Spectator Parking $6.00 per Vehicle
Overnight Parking available by
Reservation, Thursday, Friday & Saturday night
ONLY
Food at Concession Stands
available Sat & Sun
Pizza & Wings Friday Night

++

Contest Director: Paul Goldsmith 602-323-7753 PT19Nut@aol.com
Asst. C. D. Noel Hunt 586-799-3041 rcstrutter@gmail.com
1/8 TH Air Force Commander: Jim Spice 224-374-2696 coptercptn@gmail.com
John Geyer 1/8 TH Air Force Liaison: 602-810-1767 jegeyer@centurylink.net
www.usscalemasters.org + www.oeaf.org +

www.azmodelaviators.com

Join us for the

10th Annual

Central Coast

Giant Scale Fly-In

July 27th - 31st 2022

Hosted by the Tri-Valley RC Modelers of Santa Maria, Ca.
AMA Gold Leader Club #170

The facts:

- Landing Fee: Only $30. Includes 5 days of flying, lunch on Saturday, & raffle ticket;
- Dry camping for $10/night, first come, first served;
- Only Giant Scale planes until 5pm; (Mono 80", Biplanes 60");
- Proof of current AMA required;
- Epic Pilot's Raffle on Saturday.

The fun stuff:

- World Famous Santa Maria Style BBQ dinner on Saturday night;
- Beautiful Santa Maria weather;
- Hotels available nearby;
- 500' asphalt runway and expanded shade cover,
- Open flying after 5pm;
- Camping's open July 26 - Aug. 1st

Please call Chuck Barnes at (805)886-7921 or email him at CDBarnes10@comcast.net to preregister for this event.

2021 Pilots

www.trivalleyrcmodelers.com

2022 WINGS OVER ARIZONA

Scale Fly-In

Special Saturday Night Fly

APRIL 8,9,10
9:00 to 4:00 each day

2021 Best of Show: Spencer Kleinhan's F-16

Hosted by ARIZONA MODEL AVIATORS

Superstition Airpark, Mesa AZ www.azmodelaviators.com

Size Matters Less this Year!

- 60" or larger wingspan for monoplanes
- 40" or larger wingspan for biplanes
- Gas, Glow, Electric, Turbine* (*waiver req)
- AMA required
- Over 55lbs requires waiver
- No 3D flying permitted
- AMA Sanction #12196

Pilot Fee: $40 for all 3 days
Spectator Parking: $6 per car
RV Dry Camping: RSVP Required (contact CD)
Food Vendors available for lunches

DAWN PATROL Saturday 7-8am
for both military and civilian pre-1939

NIGHT FLY Saturday 6-8pm
for models with lighting

RSRP & additional event info at our Facebook page
https://www.facebook.com/winosoveraz2022

Awards for: BEST MILITARY, BEST CIVILIAN, BEST MULTI-WING, BEST WW1, BEST OF SHOW

CD: Tim Dickey – tdickey2@icloud.com – (480) 540-7553
Co-CD: John Mangino – manginoaz@cox.net – (480) 980-1386

ARIZONA MODEL AVIATORS

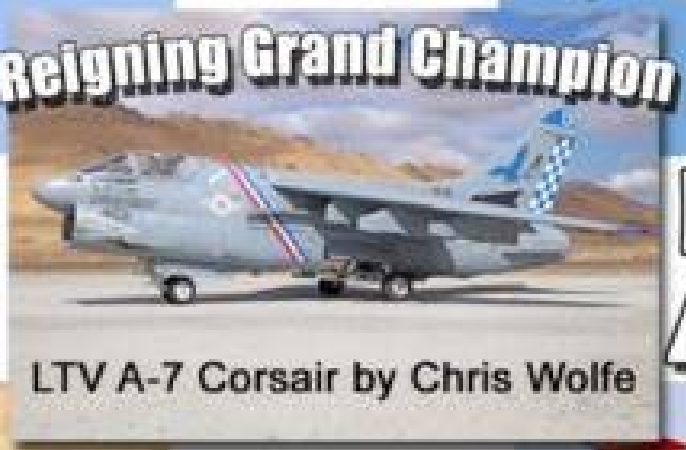
PROUDLY PRESENTS

U.S. SCALE MASTERS ASSOCIATION

2022

41st National Championships

Model Aviation's Most Prestigious Annual Event



October 19 - 23

Mesa Arizona

At Superstition Airpark Meridian rd. & Levee dr.

R/C Scale Contest

Pilot's Compete for Prizes and National Recognition

Tim Dickey - tdickey2@icloud.com | Paul Goldsmith - pt19nut@aol.com
480-540-7553 602-323-7753
www.usscalemasters.org www.azmodelaviators.com

Advancing & Promoting the Hobby of Remotely Controlled Scale Miniature Aircraft

Many people from all walks of life find it fascinating to produce a miniature working replica of a full-size object, be it a doll house, sailing ship, or operating steam locomotive. In our case it is our passion for flying machines that motivates Scale Squadron members.

Today as scale modelers we pursue nearly every possible aviation subject with the confidence that not only will our project be successful, but that it may well outperform that of its full-scale counter-part.

Squadron members delight in the pursuit of authenticity for scale projects. This requires research and documentation of specific aircraft and their variants.

Many of the flying replicas thus created are of Museum Quality and our members take to the skies with these flying miniatures regularly and successfully.

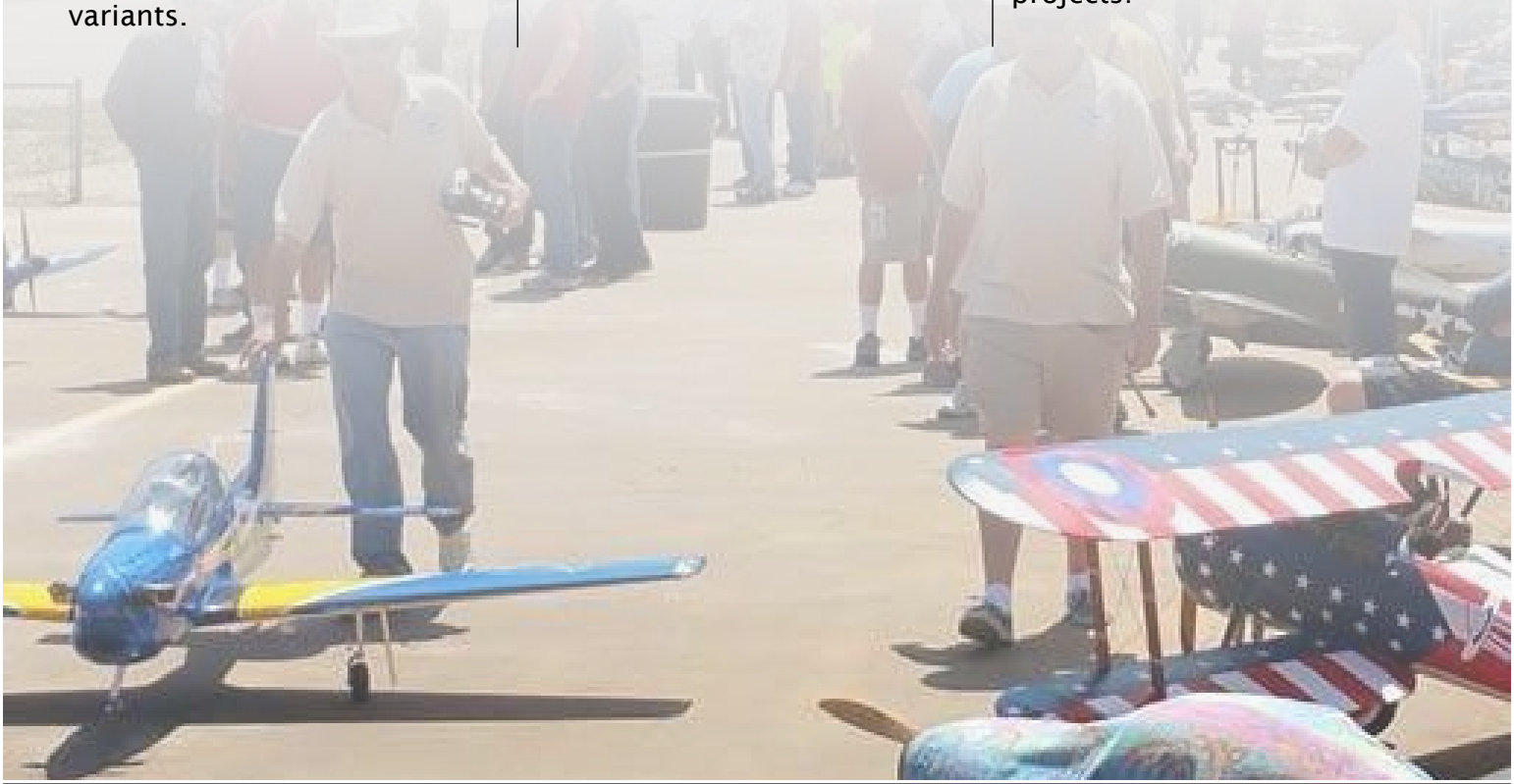
On the other hand, not everyone wants to make a scale masterpiece. That's OK, too! Whatever pleases you is what counts. Whether you are kit bashing, volunteering at charity aviation events, or making molds from scratch for Scale Masters or AMA National Championship competition scale aircraft, Scale Squadron is a club that embraces all facets of scale aviation R/C modeling and the related community.

Scale Squadron Club Meetings are held on the **second Monday of each month** at:

Green Valley Adult Clubhouse
17215 Los Jardines West
Fountain Valley, CA.

Meetings start at **7:00PM** and last about 2 hours.

Our meetings throughout the year include the usual club business as well as Member Show & Tell, Modeling How-Tos, Aviation and Industry presentations, and good ol' time social gathering to help enlighten and encourage our membership to push the boundaries in the art of Miniature Aircraft Replication. Visitors are always welcome. All members and visitors alike are encouraged to bring their latest scale models and projects!



JOIN US!

Membership Requirements

Membership in the Scale Squadron is open to all Academy of Model Aeronautics (AMA) members who are interested in safe formal and informal flying, including the research, building, and flying of Scale R/C Miniature Aircraft.

Membership Annual Dues are $30.00 covering January 1 through December 31. Membership begins after verification of your current AMA membership card, your FAA Small UAS Certificate of Registration, and receipt of Scale Squadron membership dues.

The Scale Squadron Board reserves the right to deny or delay new membership approval.

Membership Benefits

Membership in the Scale Squadron includes:

- A subscription to the *Scale Dimension* monthly online newsletter.
- Squadron membership card and name tag.
- Advance notice of scale aircraft events.
- Annual Holiday Banquet for members and one guest.

Membership Meetings

Meetings are the second Monday of each month at 7:00pm. The December meeting includes the Annual Holiday Banquet and raffle drawings for anyone who presented a topic at any of the monthly meetings.

See the *Who We Are* secion of this issue for details on the meeting location.

How to Join

If all this sounds like something you would like to be a part of, you can join us in a couple ways:

1. See the last page of this issue for a membership application. Fill out the form and submit it along with the required supporting documents.
2. Use the **Online Form** on the Squadron's website to provide basic information and pay the membership dues. A copy of the online form will be sent to you via amail. Print this out and submit it with the required supporting documents.

How to Submit Your Application

All membership application submissions must include:

- A hard copy of the membership application form
- If the membership dues were not paid online then include a check for $30.00 made payable to "Scale Squadron." Dues are not prorated if you join after January 1.
- A photocopy of your AMA membership card
- A photocopy of your FAA Small UAS Certificate of Registration

Mail these to:

Scale Squadron Membership
PO Box 8074
Fountain Valley, CA 92728

You will receive your membership card and instructions for how to obtain your key to the OCMA field by return mail in about a week.

SCALE SQUADRON OF SOUTHERN CALIFORNIA

THE SCALE SQUADRON OF SOUTHERN CALIFORNIA

MEMBERSHIP APPLICATION

AMA ACADEMY OF MODEL AERONAUTICS
AMA Charter 1520

Membership in the Scale Squadron is open to all AMA members who are interested in safe, formal, and informal flying, including the research, building and flying of Scale R/C Miniature Aircraft. Membership Annual Dues are $30.00 covering January 1 through December 31. Membership begins after verification of your current Academy of Model Aeronautics (AMA) Membership Card and receipt of Scale Squadron membership dues. Membership in the Scale Squadron includes a monthly newsletter and Squadron name tag. Meetings are the second Monday of each month at 7:00pm.

NEW ☐ RENEWAL ☐ Recommended by _____ DATE _____

Name _____ Spouse _____

Address _____ City _____

State _____ Zip Code _____--_____ Email _____Birthday _____

Home Phone _____ Work _____Ext _____ Mobile _____

AMA#_____ FAA _____ USSMA _____ FCC/Ham _____ EAA _____

MODELING INFORMATION

Years in R/C _____ Modeling Level: New ☐ Intermediate ☐ Expert ☐ Need Help ☐

Interest Area: WW1 ☐ WWII ☐ Golden Age ☐ Civilian ☐ Vintage ☐ Jets ☐

Private or Commercial Pilots License & Type Rating _____

Are you interested in Scale Competition? Yes ☐ No ☐ Would Require Assistance ☐

How did you hear about the Scale Squadron? _____

GENERAL INFORMATION

Meeting Preferences. Check all areas that you would like to see at the monthly meetings

How To ☐ Videos ☐ Guest Speakers ☐ Scale Techniques ☐ Scale Contest Prep ☐

Your Ideas _____

Would you be willing to assist at Scale Squadron Events? Yes ☐ No ☐ Maybe with Help ☐

Registration ☐ Gate ☐ Flight Line ☐ Judging ☐ Scoring ☐ Cooking ☐

Comments

_____

NOTICE: This information is only for the Scale Squadron Data Base and will not be shared or sold to any outside agencies. Your information may be used in a Scale Squadron Membership Guide available only to paid members.