



# The *SENIOR PATTERN ASSOCIATION*

Official S I G (Special Interest Group) of AMA

**Dedicated to the Building, Flying and Competition of Vintage Pattern Model Aircraft**

SPA NEWSLETTER [www.seniorpattern.com](http://www.seniorpattern.com) MAY-JUNE 2018

*PRECISION AEROBATICS from PATTERN'S Golden Age*

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Duane Wilson

[avlwilsons@charter.net](mailto:avlwilsons@charter.net)



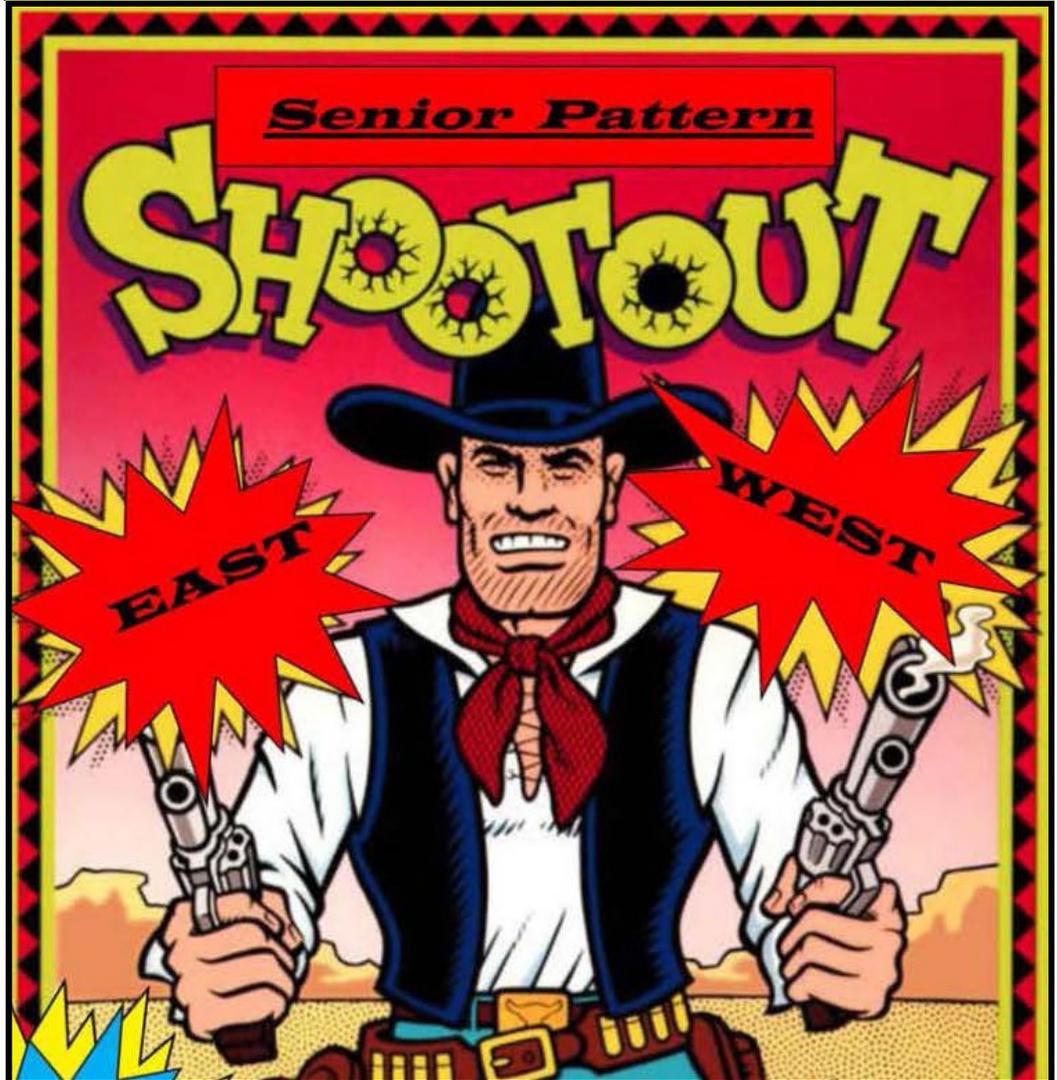
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Join our Discussion list from within the webpage or inform any officer and we'll "sign you up". It's like a gigantic Mailing-list, but at NO CHARGE. A service to membership and potentials from SPA.





**Bruce & Jane  
Underwood**

**TOP NOTCH TROPHIES**  
2044 O'Brig Avenue  
Guntersville, Alabama

Work: 256.582.0606

Home: 256.582.3742

Email: [topnotchtrophies@bellsouth.net](mailto:topnotchtrophies@bellsouth.net)



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**...SHOOTOUT...  
I'LL BE A GUNNIN' FUR YA  
YOU LILY-LIVERED VARMINT**



This has been a strange year from the standpoint of SPA activity. For a variety of reasons several of our early-season contests have been cancelled or postponed until later in the year. This has made for a rather slow start to the season – two contests each in the East and West divisions. In the East the attendance has been lower than in previous years – 11 contestants each for both contests. In the West it was a bit higher with 15 contestants at the Texas Wings contest (I haven't heard the results of the Golden Triangle event as I write this on July 2.) I wish that I could offer a simple explanation for the drop off in attendance, but I can't. It seems to be a complex combination of health, age, changes of interest, weather, and a general decrease in interest in model competition events (AMA Pattern and AMA Helicopter events seem to have similar problems.) It certainly isn't due to the venues available to us. I was at the Prattville contest in early June and the facilities there were top notch (see the write-up on the web site.) In just a few weeks as I write this we have several more contests – Cullman, Alabama on July 21-22 and the East-West Shootout on August 4-5 in Toone, Tennessee. As of today these two contests have 12 and 10 contestants signed up, respectively. Folks, we can't expect CDs and host facilities to keep putting on contests if we do not have good turnouts. Now is the time to talk to fellow club members and try to get them to turn out for these events. Members new to pattern as well as those who used to participate in SPA events – we need them all!

We have had a change in the make-up of the Board of Directors. Long-time Chairman of Special Projects (aka the contest scheduler) Dan Dougherty has asked to be relieved of his post in order to pursue other interests – including, but not limited to, building and racing sports cars! I know that I speak for the membership as I thank Dan for all the work he has done coming up with a full schedule of events each year. I am also pleased to announce that our new CSP is Jamie Strong. Dan took the duties over from Jamie a number of years ago and now Jamie is back! He is already working on next year's schedule and he has some rather creative ideas to spark new interest in our contests. Stay tuned!

Recently there has been some discussion about our rules for maneuvers and the descriptions that are included in the Competitors Guide. SPA was founded on the idea of providing the opportunity to participate in pattern competition as it was in the early days of pattern flying. The basis for the competition was to be the rules used back then as published in the AMA Rulebooks. The relevant excerpts from a large number of these Rulebooks can be found on our website. The intent is to use the descriptions – including downgrades – in their original form. Sometimes editing errors do occur and these are fixed in subsequent issues of the Competitors Guide. Phil Spelt deserves our collective thanks for all the work he has done and continues to do in this regard. Sometimes the descriptions did change from year-to-year and this can cause some confusion. In future editions I intend for there to be a reference to the year chosen for the maneuver description. That way there should be no confusion as to what is expected for each maneuver. This is an ongoing process. But, it should be remembered that the AMA Rulebooks are intended to be the official basis for each maneuver.

From time-to-time I do get questions as to why we can't come up with our own maneuvers, our own descriptions, etc. My response has always been that the intent of SPA was to fly pattern as it was flown back then and the rules already exist. From past experience I can guarantee that the project of coming up with a new set of descriptions would generate more confusion than staying with what has been published. Remember, these Rulebooks were sufficient for supporting pattern competition for several decades! Until next time, keep 'em flying! .....Jeff

# Prattville 2018

Bruce Underwood & Jamie Strong



## Prattville, AL June 9-10



For the most part of the weekend the wind was about as indicated by the limp “Old Glory” on Friday afternoon. The temp in the 90’s was relieved by a thunderstorm of about an hour’s duration when it was needed most on Saturday afternoon. Matt Griffitt earned a “10” on his initial go at CDing an SPA contest. The shot below is at the greeting and pilot’s briefing. Matt explained the number of rounds he intended (and did) fly was six, 5



on Saturday and one Sunday morning. Turned out to be, for most classes 4 on Saturday and 2 on Sunday morning. He and his club member assistants were most efficient in their handling of details. Because of the few helpers, he had the contestants hold onto their individual score sheets and run them to the scorekeepers, Jim and Bobbie Johns, pick them up and return to the judges prior to each flight.

Pastor Nic Nicholson, local member, petitioned God’s help to “please guard the event from casualties” in his opening prayer (recalling the numerous ones in the first contest in Roberta, GA)..there were NONE! Your reporter can’t even recall anyone breaking a prop. What a delight to report!



It’s a genuine joy to introduce a newcomer to SPA who is flying in his very first SPA contest. Mr. Terry Boston from Byhailia, MS which is 14 miles SE of Memphis, TN. Terry was an “ole-timer” and flew with the group out of the Ohio area in the “golden-era”. He belonged to the club in Cincinnati, OH with Dave Brown, Chuck Shade and others that most of you readers recall from that era. He happened up on the SPA website and learned of us via Jim Johns excellent work on the site. (*Webmaster's note - Terry and I both flew in the 1987 AMA Nats in Lincoln, NE.*) You couldn’t help but know you’d encountered a good modeler when you first saw his truck bearing the “I’d rather be flying”

front license plate. He flew well winning 4 of the six rounds in NOVICE class. Dr. Fred Robertson took the other two. Scoring in the other classes went like this...in SPORTSMAN , Jim Strong aced the class with 3000, Charlie Johns scored 2761. In ADVANCED, Curt Diggs placed first winning 3 rounds while Bill Dodge won 2 to place second. The EXPERT class was simply textbook, as we expected, with Greg Hoke winning 4 rounds to Jamie Strong’s 2. How about this for closeness, Hoke 4000, Strong 3982. I repeat, these two should be demo pilots for the SPA rulebook.



← (Left) You just don’t get better “Sportsmanship” than that, do ya??????? Wouldn’t this world be a better place with more competitors like these two?

→ (Right) Speaking of sportsmanship, let me compliment Mr. Bill Dodge, who was kind enough to lend your’ reporter and PIO his airplane, since an electronic malfunction in a digital servo claimed my bird about 10 days ago....gosh, what a gesture Bill.



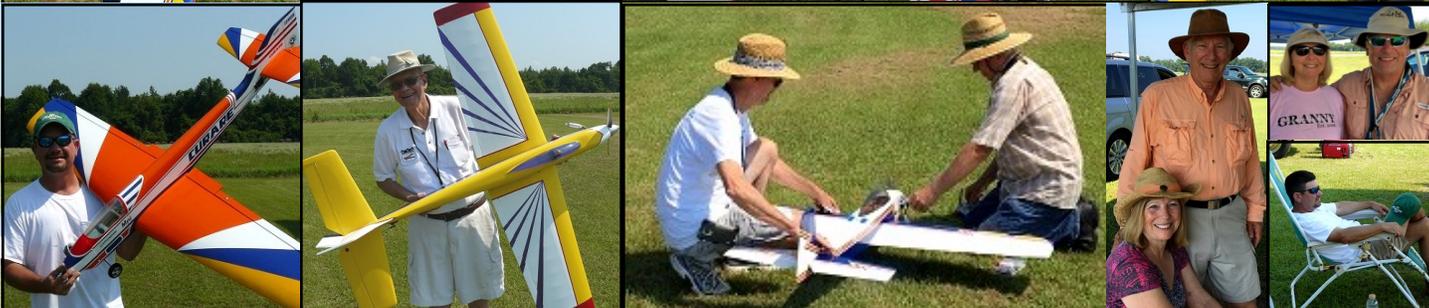
Jeff Owens aced our SENIOR EXPERT class with 2000, I was lucky to amass 1806 and second, Jim Johns stepped up into the "oldies" class and with just one round amassed 761. Jim shared his flight with scorekeeping. Many thanks, Jim. Keith Watson, our great VP, came, paid his entry but didn't fly. Much obliged Keith and so good to see you improving from those "gout" issues.

Though there were only eleven competitors, those that faced the temps in the 90s had a great time. We know that our region in the Southeast can do better!!!

That said, the Fountain City Flyers give a big Thank You for All of You that did Come. We shared a lot, and talked a lot, as usual.

Matt and the Fountain City Flyers.....you took just a few of your membership and entertained as if there was a dozen of you. Thanks for a Deelightful weekend of doing what we enjoy doing the most, flying SPA and fellowshiping with folks it's simply GREAT to be with!

<b>NOVICE</b>	
<b>Terry Boston</b>	<b>4000</b>
<b>Fred Robertson</b>	<b>3843</b>
<b>SPORTSMAN</b>	
<b>Jim Strong</b>	<b>3000</b>
<b>Charlie Johns</b>	<b>2761</b>
<b>ADVANCED</b>	
<b>Curt Diggs</b>	<b>3937</b>
<b>Bill Dodge</b>	<b>2963</b>
<b>EXPERT</b>	
<b>Greg Hoke</b>	<b>4000</b>
<b>Jamie Strong</b>	<b>3983</b>
<b>SR EXPERT</b>	
<b>Jeff Owens</b>	<b>2000</b>
<b>Bruce Underwood</b>	<b>1807</b>
<b>Jim Johns</b>	<b>761</b>



# TEXAS WINGS "Buzzardaire" 2018



**June 9, 2018.** The annual **Buzzardaire SPA** contest took place at Texas Wings field in Newark Texas. Special recognition and many thanks go to the Wings club, a long-time supporter of SPA, for hosting us again this year. Their cheerful volunteers were invaluable in set up and clean up, running scorecards, keeping generators running, and serving a fantastic taco lunch.

Fifteen flyers, a decent turnout for June heat, flew 5 rounds in temps of hi 90s and south winds varying from 8-17 with gusts to 23, a nice breeze for a hot Texas day. There were no crashes or even dings. These guys really have been practicing, reflecting the fact that many SPAers are out every weekend at T-birds making lots of smoke and noise. Many classes are ending up with placing too close to call until after the last round.



(Left) Samuel Corlett shows off his ARF Kaos used in his first SPA contest. New SPA flyer Samuel Corlett did a fine job in **Novice**, with very smooth flying, winning that class.



(Left) Paul Mayhan and his winning Sweet Tator. Paul Mayhan and Frank Cox took First and Second, respectfully, in **Sportsman**.

(Below) There were 6 in **Advanced** with Sam Corlett (Sr) taking first, Chris Berardi second, and Bernie Olson a close third.

(Below) In **Expert**, Pat Ensign took first out of 5, with a close second place showing by Wayne Galligan, and a third place earned by new SPA flyer Stephen Byrd.



**Senior Expert** rounded out the contest with Robert Redmon in first place and Ken Knotts taking second. At left, Robert Redmon uses his electric Curare to win Senior Expert.

**SPA West****Texas Wings June 2018****SPA Novice****Standings - Round 5****6-10-2018 Page: 1**

The Scores for all contestants have been entered through Round 5  
 These are the final standings at this time. '\*' Indicates score included in total.

Pos.	Name	AMA No.	Total Score	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6
1	Samuel Corlett	997867	4000.0000	1000.00*	1000.00	1000.00*	1000.00*	1000.00*	

**SPA Sportsman****Standings - Round 5****6-10-2018 Page:**

The Scores for all contestants have been entered through Round 5  
 These are the final standings at this time. '\*' Indicates score included in total.

Pos.	Name	AMA No.	Total Score	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6
1	Paul Mayhan	891050	4000.0000	1000.00*	0.00	1000.00*	1000.00*	1000.00*	
2	Frank Cox	5810	86.7430	0.00	0.00*	0.00*	86.74*	0.00*	

**SPA Advanced****Standings - Round 5****6-10-2018 Page:**

The Scores for all contestants have been entered through Round 5  
 These are the final standings at this time. '\*' Indicates score included in total.

Pos.	Name	AMA No.	Total Score	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6
1	Sam Corlett	102920	3990.2359	876.86	1000.00*	1000.00*	1000.00*	990.23*	
2	Chris Berardi	250824	3962.7417	1000.00*	994.81*	966.07	967.92*	1000.00*	
3	Bernie Olson	21777	3889.9822	957.64*	955.05*	983.03*	994.24*	0.00	
4	Gary Alphin	6055	3677.7511	835.29	980.12*	875.89*	839.63*	982.09*	
5	Tommy Scarmardo	77400	3418.6383	762.35	801.21*	928.57*	815.78*	873.06*	

**SPA Expert****Standings - Round 5****6-10-2018 Page: 4**

The Scores for all contestants have been entered through Round 5  
 These are the final standings at this time. '\*' Indicates score included in total.

Pos.	Name	AMA No.	Total Score	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6
1	Pat Ensign	41158	4000.0000	1000.00*	1000.00*	1000.00*	1000.00*	1000.00	
2	Wayne Galligan	679374	3874.9069	980.59*	22.37	978.22*	957.30*	958.77*	
3	Stephen Byrd	529245	3796.3370	370.95	912.79*	975.27*	980.70*	927.56*	
4	David Dingman	75189	3648.5164	888.88*	847.38	924.07*	935.67*	899.88*	
5	William Vogeley	979993	3486.4450	831.27	852.55*	872.27*	898.24*	863.36*	

**SPA Senior Expert Standings - Round 5****6-10-2018 Page: 5**

The Scores for all contestants have been entered through Round 5  
 These are the final standings at this time. '\*' Indicates score included in total.

Pos.	Name	AMA No.	Total Score	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6
1	Robert Redmon	58073	4000.0000	1000.00*	1000.00	1000.00*	1000.00*	1000.00*	
2	Ken Knotts	619520	3643.3649	900.49*	875.46*	941.10*	926.30*	862.09	



Pat and Tommy discuss flying techniques



Scarmardo gets ready as Berardi flies.



Pat Ensign in official "Buzzardaire" CD headgear



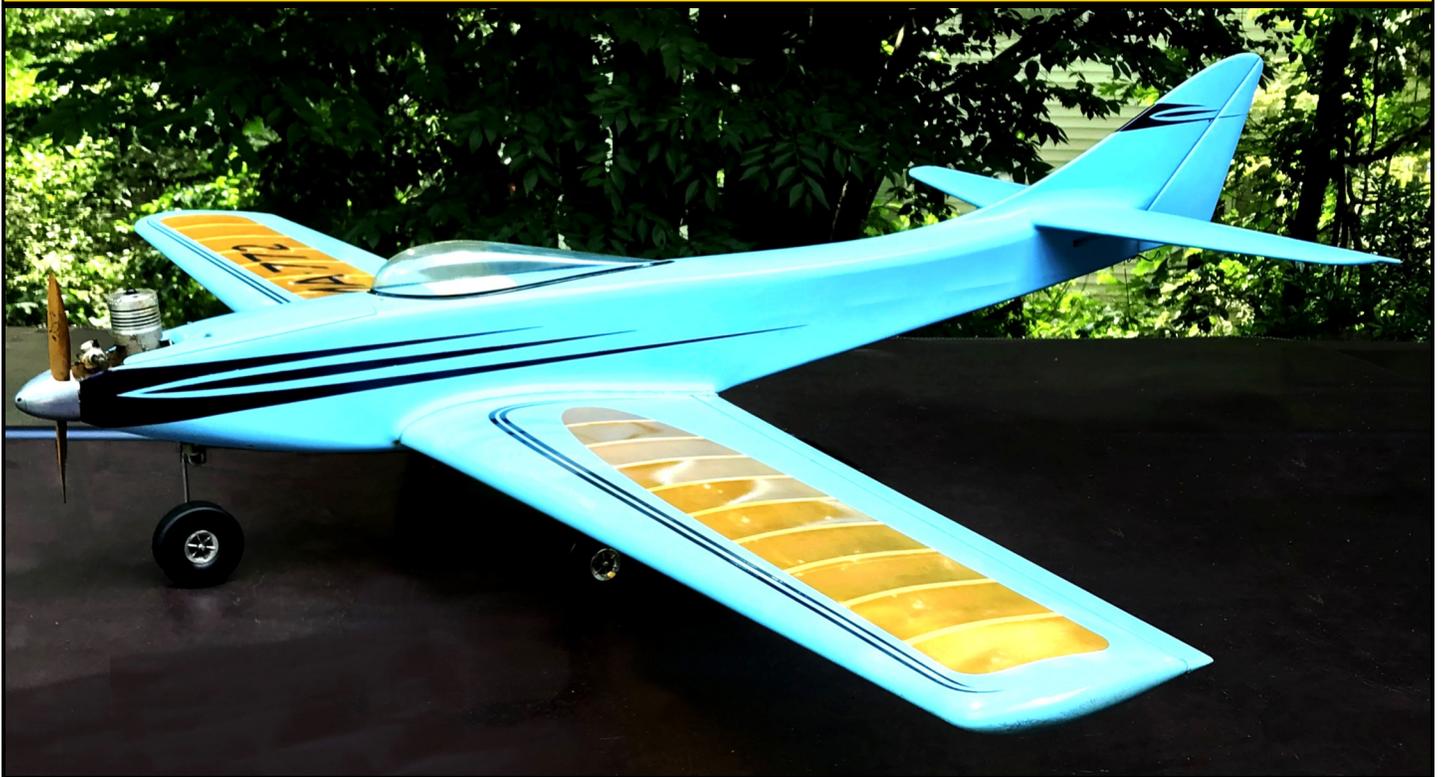
Gary Alphin wins the Grand Prize - an OS 65AX engine courtesy of JT's Hobbies



# Suitable for SPA? ...By Duane Wilson

*Could This 52 Year Old Beauty be Competitive at a Modern SPA Contest?*

## THE STORY OF TOM BRETT'S 1966 NIMBUS III



**Many of you know** that Tom Brett was a personal “hero” of mine back when I was an impressionable teen in Michigan, (my very first plane was finished in his traditional colors.) I first got to know his widow Helen personally in 2009 when I was able to deliver a video to her about Tom from a mutual friend, Chuck Winter, a retired USAF fighter pilot who had taken a lot of home movies from the mid-60s featuring the Detroit club. After that visit, I started a RC Universe thread on Tom’s designs that delved in detail into each of his planes. I later was able to write my last article for Model Aviation (Nov 2016), about his TBX-I pattern ship that flew at the 1965 NATs and won a design award.

A couple weeks ago, I received an unexpected email from Helen, (who is near 90 years old but continues to be very active and in good health), telling me that she had decided to downsize and move closer to her daughter. She asked me if I would be interested in TBX, or other planes belonging to Tom. Would I????!—you’d better believe it! I had always wondered if Helen would someday let me buy, (or obtain in some way,) any of Tom’s planes sometime in the future, but I knew how very important they were to her. Helen has always been Tom’s number one fan, and she was always very cooperative in helping me promote his memory to a new generation of modelers. When she had to down-size, I was so very grateful that she thought of me.

I got the email on a Tuesday and by Friday morning I was on the road for Michigan. I took everything she offered that I could fit into my SUV. We spent a couple hours bubble-wrapping everything along with her daughter Sheryl who I was finally able to meet. Tom was an impeccable builder, and frankly I enjoy just looking at the workmanship.

I was given **Apogee, TBX-I**, and his lesser known (and much larger) pattern designs **Cirrus, and Nimbus III**. Cirrus was designed after Perigee/Apogee, with Nimbus III being Toms last design, built during the winter of 1965-1966 for that flying season. Tom logged only a few flights with it before he left the hobby to fly full-sized planes with Helen. I have added new posts to the [Tom Brett Designs Update Classic Pattern](#) thread, and hope to add more as time goes by.



**Apogee:** The sister ship of Perigee which won the second FAI WC in England in 1962, Perigee hangs in the Museum in Muncie.

Apogee was the back-up sister ship of Perigee, which was arguably the sleekest and “sexiest” thing around in 1962. Both went to the second FAI world championship. Both Apogee and the 1965 design award winning TBX-I are far too valuable to do anything with other than to look at and admire. While both planes are potentially air worthy, they each show signs of possibly being delicate, especially in the open silk areas, (remember that the silk is 52-56 years old.) Both would need re-silking and re-painting, and frankly, why would anyone want to disturb Tom’s beautiful original paint job in order to risk putting them in the air? Instead, I would like to take them to shows, and eventually donate them to a modeling museum such as the one at Triple Tree Aerodrome in Woodruff, SC where the Joe Nall fly-in is held each year. The AMA Museum already has the Perigee, the identical twin and 1962 FAI world championship winner hanging there next to one of Ed Kazmirski’s original Taurus models. The museum might possibly be interested in TBX, but I personally doubt it, (it’s a small museum and can’t accept every worthy model.)



**TBX-I:** Tom’s award winning, dramatically swept wing model flew at the 1965 Willow Grove NATs. All Tom’s planes feature gorgeous workmanship!

Now we turn to **Cirrus and Nimbus III**, which are essentially unknown designs—even to most dedicated vintage modelers. Even at Tom’s home club, the Radio Control Club of Detroit, few modelers remain that remember them. Their only real distinction now is that each is well over 50 years old and still in existence. What should I do? I have Helen’s permission and even encouragement to explore the possibility of enjoying these planes again by flying them, The Nimbus III in particular is essentially in like-new condition with little exposure to the elements or structural fatigue (photo page 5). We will see what happens, but regardless, I’ll take every precaution no matter what decision is made, the same way we were careful about flying Ed’s final Taurus, (which we affectionately call the Taurus II, (it’s still with us.) We have some great pictures of that plane “in action”.

It was said by a friend and flying buddy of Tom’s that all of Tom’s planes looked and flew basically the same way—the primary difference was **in the size of each model**. The best known, Tom’s Perigee/Apogee was smallest with only a 61” wingspan. It was basically a downsized version of his successful Nimbus II, (featured in American Modeler magazine). The downsizing was needed for the demanding vertical maneuvers promised for the 1962 FAI.

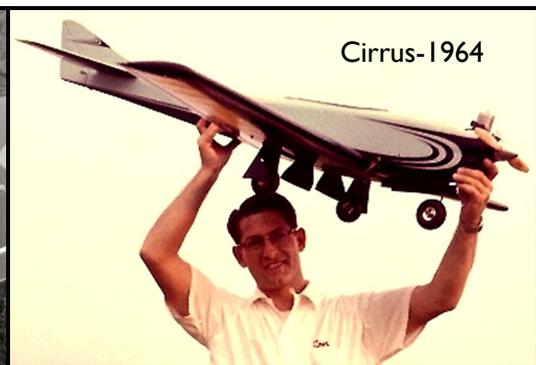
**Cirrus** was the largest of Tom’s models, with the final version having a substantial 74” wingspan and 850 square inches. The weight of the (very), early (and heavy), retracts with associated batteries etc. in this model resulted in an excessive wing loading with the original 64” span wing. The 74” double-tapered wing was introduced a few months later.

The plane was specially designed for an early version Don Brown proportional back in 1963, and was the only plane Tom designed not intended for reeds. Note that the fin on Cirrus is the most upright. Tom could never get the DB radio to work reliably, even after several trips back to the factory, so he went back to flying Perigee and Apogee.



The plane was specially designed for an early version Don Brown proportional back in 1963, and was the only plane Tom designed not intended for reeds. Note that the fin on Cirrus is the most upright. Tom could never get the DB radio to work reliably, even after several trips back to the factory, so he went back to flying Perigee and Apogee.

Tom’s flying buddy Willie McMath with his Cirrus done up in a more traditional Brett scheme. It looks like the 850 wing. Pictures of Tom are with original 64” wing.



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**Tom’s flying buddy Willie McMath with his Cirrus done up in a more traditional Brett scheme. It looks like the 850 wing. Pictures of Tom are with original 64” wing.**



**Nimbus III** was designed in the winter of 1965, a time when many pilots were exploring larger planes, (i.e. Ed Kazmirski's Simla.) It is like a new plane that once trimmed out, was put into storage-like being in a time capsule. The plane flew for less than a month—no more than a handful of flights because Tom was ready to leave R/C in favor of full-size aircraft. Unfortunately because his interests were changing, there are no pictures of him with Nimbus III, or even the Nimbus III alone from that time period. The only pictures taken were done recently.

The Nimbus III has a moderate and very manageable 72" wingspan, **yet it weights less than six pounds complete** "dry", and less than five pounds as you see it in the photo on page 7 without radio and power pack. All of Tom's planes featured hand-selected balsa for the intended purpose. All hardware is home-made, (not much available commercially back then.)

Since "...all of Tom's planes fly essentially the same", **the Nimbus III is essentially a "large Perigee"—exactly what I would personally like to fly.** I enjoy larger models that are easier to see, and respond a bit more elegantly, (smoothly/softly). The original Perigee was, and still is a "hot" plane with anything greater than a .45 for power. In this age of wanting all the power we can get and wanting "unlimited vertical", the original Perigee flew with a (only) a "detuned" K&B .45

Talking about speed and power requirements, all of Tom's engines came before the era of mufflers, and even if noise isn't an issue, they may not even run now. As mentioned Perigee/Apogee used a detuned K&B .45. He later switched to a Merco .61 for both the TBX and Nimbus III. The Merco in the Nimbus III is almost new, but of course it long ago was "frozen" into place. I believe a modern OS AX 55 would probably be more than adequate for a model this light.

Let's return to the original question. How would the Nimbus III do in SPA now? I'm not talking about the upper classes where differences in design can sometimes be critical when it comes to winning. I'm talking about NOVICE and SPORTSMAN where the more basic maneuvers are less taxing on the design, and success has more to do with basic flight skills and practice-practice-practice.

Looking at the plane, the stab sits up high above the thrust line, and the rudder line is on a diagonal. Nimbus III and all of Tom's planes were designed with reed radios in mind. With modern proportional radios will a plane designed for reeds fly better—probably. So would a plane like Nimbus III be suitable in the lower classes? I think it depends a lot on the person moving the sticks!

I remember my very first SPA contest held at Cave Springs Georgia in July 2005. All I remember was that it was "hotter than blazes" that weekend. As a guy raised in Michigan, I don't think I've ever been that hot—I sure wasn't used to being out in it all weekend. By Saturday evening my eyes were "hard-boiled", and my skin is starting to melt. Anyway, that's the weekend I first met Bruce, Scott Sappington, Rhey Starnes, and Bruce's son Cass. I remember a couple things particularly about that contest, (other than how hot it was.) The first was my first flight, (Bruce smooth-talked me into flying-I was just going to watch.) My caller released the Taurus and it promptly careened directly into the weeds on my first take-off. The second thing was how Cass flew my "new" twenty year old Taurus after the contest was over. I wanted to see what my Taurus was capable of, and Cass (oddly enough), had never flown a Taurus. He took the transmitter, planted his feet and went into his "stance." He made that plane "dance" on its wings. I watched with my mouth falling open as he executed 4-Point Rolls, Figure Ms, (basically the whole Expert pattern), having never practiced with my plane other than demonstrating the NOVICE pattern the day before. I was totally awed at what my Taurus could do in the right hands. It was absolutely marvelous to watch—I will never forget it! It was the highlight of the weekend for me.

The bottom line is that a properly built and trimmed pattern plane of any vintage is inherently designed to fly aerobatics smoothly, gracefully, and beautifully. I'm pretty sure that Tom's Nimbus III in the right hands, (somebody who instinctively knows how to make those tiny corrections at the right instant), can make the Nimbus "dance" like Cass did with my Taurus. Maybe the Nimbus III in the hands of someone who practices enough, learning to anticipate the plane's every move, might fly every bit as well. So maybe there *is hope* that I can fly the Nimbus beautifully (enough)—IF I'm patient and keep working at it.

Such is the case with all of us. We still need to burn fuel, (or electrons) over and over to get better. Though I'll never be anything more than a so-so pilot compared to an EXPERT, maybe I can at least do well enough over time, (providing I can see it of course), to do well enough to at least satisfy myself. The 72" wingspan may help in that department. Keep practicing...Duane



**Me and my Taurus at Cave Spring, Ga. July 2005. While not a "pure Brett" color scheme, you can see quite a bit of Brett influence.**

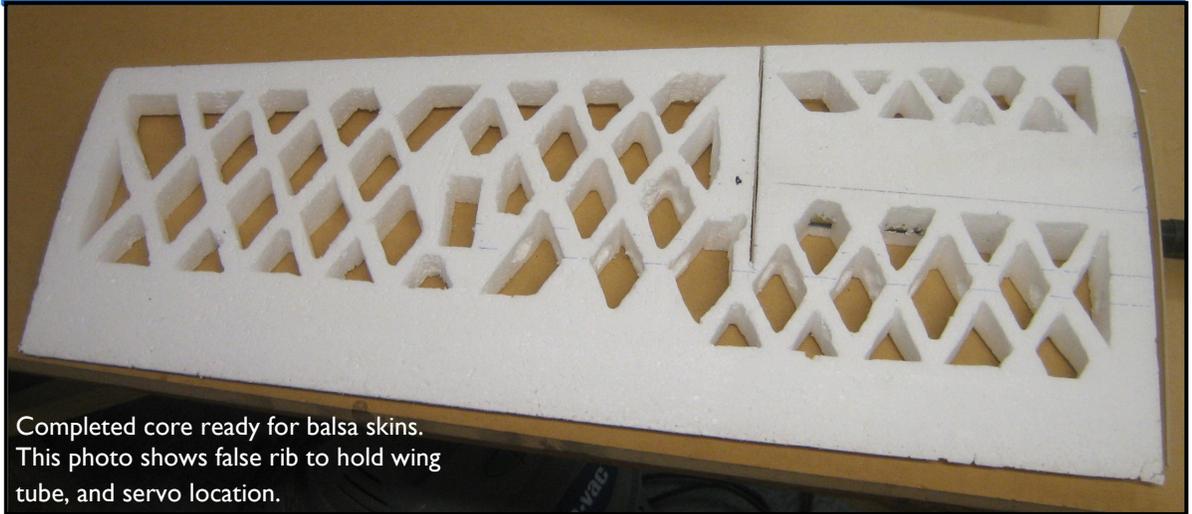
**The picture doesn't show the heat, but trust me on that one.**

**Cass put a smile on my face a bit later when he put on his flying exhibition. It made my weekend and a lot more. 13 years later I still Remember it well.**



# Going Light!-Or How to Shed Those Unwanted Extra Ounces

By Vic Koenig



Completed core ready for balsa skins. This photo shows false rib to hold wing tube, and servo location.

**I've been flying** pattern for 12 to 14 years now and just love how pattern planes track and handle. They even make an average pilot like me look good on occasion.

As much as I love this flying thing, I enjoy the

building process as much or more than any part of this hobby. I build most of my own planes from scratch since ARFs are on average much heavier than a plane you can build yourself and are not always true replicas of the original design. I also enjoy adding my own touches, paint schemes and so forth—that individual touch instead of being one of many identical models.

After building a few kits and finding the wood in them is heavier than I'd like it to be, I decided to try to scratch build my own using the patterns from a kit I'd already built and flown (and destroyed if the truth was told). After overcoming the fears we all have when doing something new the first time, I actually had a plane I was really proud of. One build led to another and then another and so on. Early on I started putting some serious thought into making the plane better. How do I make it better? Two immediate thoughts that come to mind would be to make the model lighter, and where necessary, stronger. I set out to save weight as my crusade. It's an important aspect of building for me, however you need to be careful when you do this or your plane can be put in jeopardy. You need to be sure you're actually making an improvement.

Before "going light", you need to ask yourself the question "do I want to build my plane to survive minor crashes and absorb very hard landings, or do I want it to fly its best? A lighter plane lands slower, has better vertical performance, and is more precise when controlling roll rate. Making this decision may partly depend on how advanced your flying skills are. If you still experience a fair amount of hard landings or "oh-oh" events, it is probably better to fly a bit heavier than to spend lots of time in the shop constantly making repairs, or building. As for myself, I will always choose to go lighter for my pattern planes, and if a "flying misadventure" strikes, that's a calculated risk I take in order for my planes to fly the way I want them to. One more thing—occasional rough landings happen to everyone. If you decide to "go light", it's always a good thing to have a spare or two close at hand, and to adopt a "that's the way the cookie crumbles" attitude toward occasionally losing a plane.

So the decision to save weight has been made—good choice! How best can this be done? Although weight can be saved throughout the entire model during the building process, for the purpose of this article, let's concentrate on producing a lighter wing. Why a lighter wing you ask? The answer is it will improve rolling maneuvers with increased control of roll rate. I have to do 3 rolls and a 3 turn spin. It is most desirable to be able to rapidly and precisely STOP wing rotation at the end of those maneuvers.

I choose a foam core wing because I feel there is less inertia, (momentum) and foam is stronger and resists twisting from flight conditions. My method for finishing foam core wings results not only in a lighter, but stronger wing at the same time. I record the weight of my cores at each stage of my process in order to see how much I'm saving. You may or may not want to do that.

Before we start, I realize that mine is only one of many methods to do the wing lightening process, but it works well. Hopefully there will be some part of the process that will be helpful for even the most advanced builder. That said however, the following description is intended primarily for those with less foam wing experience.

**THE BASICS:** First let's discuss things in general terms while paying attention to several important factors. These are good basic procedures to follow:

- Choose a reputable cutter who manufactures good cores. Ask around and you'll quickly learn which cutters to use. You want to stipulate *virgin foam* not recycled before ordering. Confirm with the cutter if there is any doubt.
- Upon delivery, pay attention to the accuracy of the wing cores with hopefully few surface ripples or other irregularities caused by the hot wire.
- Determine how much each core weighs when you open the box. Are they close to the same weight when you get them. Not all foam is equal in weight. The better cutter will discriminate on the foam they choose. A heavy wing can only be remedied by adding weight to the opposite side. Attention here will eliminate weight additions.
- If all is well, mark your wings and shucks. Always keep the cores in the original shucks even if the wing is symmetrical. I mark the top and the bottom of the shuck and the up direction on the core itself.
- What glue will you use? In the past people used sorgum or epoxy spread with an old credit card, but epoxy is heavy, and sorgum often didn't hold long term. Nowadays, there are several products that are clearly better, particularly the hydrophilic polyurethane glues activated with a water spray mist. These will expand and permeate the small cracks and pockets in the foam. There are several companies including Elmer's and 3M that produce these glues and everyone has his favorite. Personally I prefer Gorilla glue which permeates the foam to 1/8 inch and actually adds strength. Regardless of the glue you choose, sand the core surfaces smooth because they will require less glue to attach the wing skins.
- Now it's time to honeycomb the cores. Not only will you remove foam weight, but you will use less glue and save glue weight which may be more. Apply glue to the skin/core ONLY where it contacts the core. There's no sense coating the full wing skin with extra glue if it's only going to contact the core in a few places. Refer to (Photo 1)

**WING SKINS:** No matter how light your cores turn out, you can throw all that weight savings out the window if you use heavy sheeting. Pay attention to wood weight and specify "contest balsa" if possible. For my use, I only buy 4 inch wide sheets (usually 30 inches long,) When the wood arrives, I weigh each piece with a digital scale, (sometimes called a postal scale) I want sheets that are in the less than 16 gram range. I also weigh them end to end. When and if there is a heavy end, I mark it and use it on the root end closest to the fuselage.

If you are old enough, you remember Ambroid glue. What a lovely smell it was in our youth, but this is the next century and I can't find it any more. There is a reasonable substitute made by Testors. They make three types but the green or brown tubes are equally suited for wood. I like to use it to glue the seams between the skin sheets. It is very light just as Ambroid was and it is easily sandable. Speaking of sanding, when the glue has fully dried, (about 30 minutes), it's time to do your final sanding of the sheet. Draw the honeycomb pattern on the inside surface. Sanding is easily done on any flat surface work table.

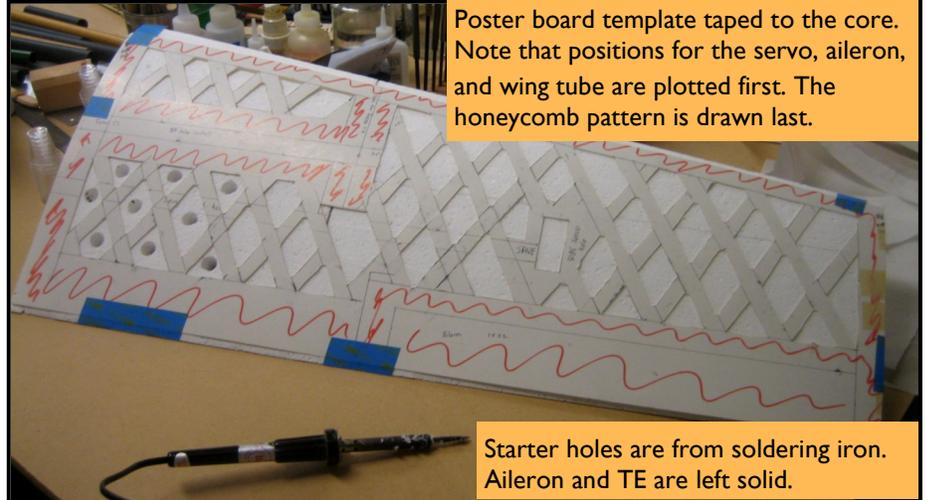
As you begin your wood choices for making the sheets, it's a good idea to make "matched" sets of left and right wing skins (see photo at right), in order to produce skins of approximately equal weight. An "equal weight mindset" is a good idea to have throughout the build. Why add weight to balance or trim after finishing to correct something you had control over when building? So equalize your sheets by placing wood of equal weight on each side when building your left and right skins with the heavy end of each sheet toward the fuselage. Ideally you want your weight distributed toward the center for your rolls as mentioned earlier. I will choose the heaviest (strongest) balsa sheet to be at the trailing edge of each skin to become my aileron.

So now our balsa wing skins are prepared. Let's now turn our attention to how to keep the core as light as possible while maximizing wing strength. When lightening a foam core, there are some considerations to keep in mind. First, never discard the shucks until you are finished sheeting the core. The shucks are your best friend in keeping the curved wing airfoil flat, true, and level throughout all the cutting processes to follow, (i.e. when cutting the ailerons from the sheeted wing, keep the wing on the bottom shuck to get an accurate vertical cut line as you run it through your band saw). To cut ailerons, you only have to sacrifice one shuck half. You can get a true vertical on the wing tip as well using the shuck.



**WING TUBE CONSIDERATIONS:** I use wing tubes, and mark where to locate the hole for my 4/40 socket screw to keep the wings on. I glue a half inch dowel directly over the wing tube to use as a hard point for that screw. I then drill and tap the dowel, the wing tube and a short section of dowel that I have epoxied inside the wing tube in order to hold the assembly together on one side of the wing. When putting the wing together to fly, only a single screw needs to be used on the other side (again using a dowel for hard point and inside the tube), to hold the wing to the fuselage. It works like a charm.

**HONEYCOMBING:** Now we need to make a “honeycomb” template in order to remove foam, (in a diamond pattern), from each wing half. Poster stock is perfect for this. First place the shuck on the poster stock to get the outer dimensions of the core. Plot out the positions of the servo bay, aileron, plywood false rib, and where your wing tubes will be should you use one. Cut the poster stock holes you want to remove with a #11 exacto blade and clean the cuts up. When taped to the shuck, I prefer an old low wattage soldering iron to poke a hole for the cutting wire. To finish the holes and make them follow the pattern I use a foam cutter I've had for years that has a foot pedal. That pedal



Poster board template taped to the core. Note that positions for the servo, aileron, and wing tube are plotted first. The honeycomb pattern is drawn last.



Starter holes are from soldering iron. Aileron and TE are left solid.

Inside surface of skin with CF Strip. Glue applied only to skin that touches foam.

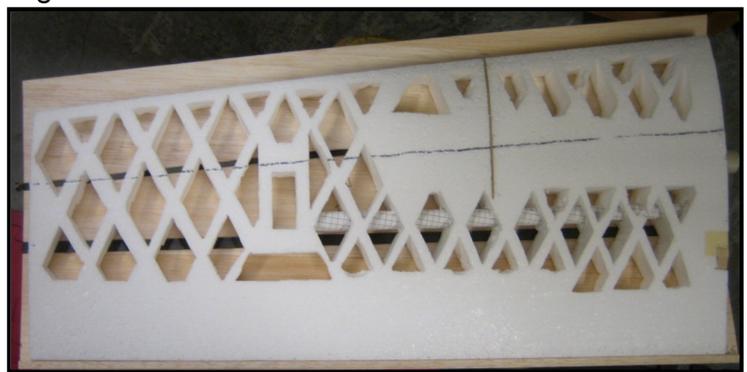
Core with glue applied mates up with skin

makes it relatively fast to cut the holes. I simply follow the card stock which is not harmed by the wire heat to do the cutting. By the time I cut a hole and release the pedal, I can flip off the top wire hook, pull the wire through the just cut hole, remove the material I cut, and by then the wire is cool enough to put through a new hole, attach the hook again and start

another cut. If you holed both the wing core and a shuck half, you will get true vertical cuts through the core. I recommend painter's tape to keep the template on the core. It takes some time to do all the holes and it may not seem worth it but I know I drop greater than a ounce and a half minimum per wing side. The holes save about an ounce themselves but the real saving is in the glue not used. You can buy a foam wire cutter commercially if you plan on doing a lot of honeycombing, or you can make your own wire cutter, (read the side bar on the next page.)

When applying the glue, I weight the glue container beginning and end in grams and monitor how much glue I'm applying on each side of the core as well as each wing half. My rule is to be equal for the top and bottom in grams used. When the glue is applied, I first outline the honeycomb pattern on the wing skin so I will only put glue where it will contact the core. In the photo you can see one type of carbon fiber tape that can be used to add strength over the wing tube area. Use an old credit card to smooth out the glue beads. This works on the wood as well as the foam.

I use Ohio Superstar CF to reinforce the wing tube area. Some local hobby shops will carry CF strips as well. In the photo you can see how I applied mine on each sheet and it runs almost over the wing tube. The only concern is to avoid the servo position. Lay the skin sheet in the shuck and carefully place the core on the sheet so the glue beads meet. I use tape and wrap the CF over the root and tip and then apply a light coat of Gorrila glue directly on it and then credit card that bead. The photo shows the ready to glue core with a paper servo tube to ease servo lead install.



## Making a Hot Wire Cutter

If you don't have access to a hot wire cutter you could make your own on a smaller scale that works well for cutting wing cores. The biggest problem is getting a power supply for the wire itself. Almost all of the higher end battery chargers have a setting in "special modes" that provides that power and can vary it to what you need to cut but not melt the core into a big mess. If you are so equipped, the next hurdle is getting the wire and making a holder for that wire. I'd go to Ebay for the wire. It's not too costly. I saw the wire for \$12.00 with free shipping. I also saw a cutting table system for \$114.00 and free shipping. I would buy the machine unless you plan to do a lot of cutting.

The next step is a yoke to support the wire. It is best to use something non conductive. A plywood yoke would do for the big outer loop. There are lots of options there; some depend on what you have available and are handy working with. The idea is to connect a positive lead to one end of the wire and having a quick connect/disconnect to the other end where the other power lead is attached. You want to be able to hook one end to the yoke you have made easily so that the wire can be threaded through starter hole you make with the iron. The yoke should have a little spring to it. On my machine the top support is just that, a springy loop that also provides electrical continuity for the wire. It has a small hook to facilitate an easy connect and disconnect. Make sure you leave enough depth to the top spring to give yourself plenty of room to move the material being cut. I would suggest mounting your cutter to a hard surface so you have both hands available to hook and unhook the wire and move the item being cut.

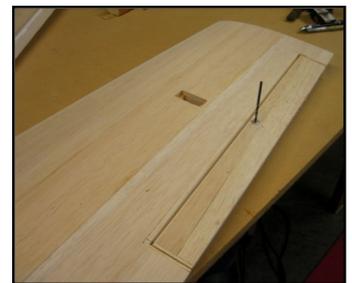
When it comes to finishing up, there are two options to set up the last step of gluing the skins to the core. Since I don't have a "new fangled" vacuum device, I use the "old fashioned" method of applying (lots of), weight on the wing set. I simply place the cores in the shucks, correctly aligned together, (both left and right side), and place a flat board on top of them to distribute the weight, then add weight. My choice is cinder blocks, three will do nicely. Apply the weight evenly. Gorilla glue is set up after eight hours if you've misted the cores, then you're ready to work. Usually some glue will come through sheet joints at some places. That's OK as you can simply "kiss" the glue/foam with a sanding bar and presto, you have a very light wing half. Of course the rest of the work is yet to be done, trimming the excess sheeting, making the ailerons, and doing the lead edge. For the latter, I have been using 1 inch tri stock glued with TIGHTBOND to the core LE. Shape the LE to your preference.

**MAKING AILERONS:** Use a sacrificial shuck to cut the ailerons with your band or jig saw. That way your cut is vertical on both the aileron and the wing. I will face both surfaces with 3/16 balsa because I feel balsa is heavier than foam. Also I have a lot of that as scrap. I never throw wood pieces away and always go to the scrap box first for a piece of wood. This is also the best way to cut the wing tip square, leave the core on the shuck to get a true vertical. You can follow the plans to mark the size of the aileron but I just compute the sq/in of the plans aileron and then use that number to make one I like. Mine give me all the roll effect I need. You may have other thoughts on this, but as the BOM (builder of the model) who is scratching the wing, you get to make that decision. I like to use a 1/2 inch dowel as a hard point for my aileron horns. While the aileron is still on the portion of the shuck that was used to cut a vertical, you can drill a vertical horn hole if the hard point is. Aileron finishing is straightforward.

**THE BOTTOM LINE:** After gluing the final weight came to 223 grams. That's only 8.4 ounces for that wing half. The other side was 8.5 ounces ready to cover. I only have one tenth of an ounce to contend with when trimming for level flight.

Another weight-saver is to use micro servos for the ailerons. Modern servos are digital, much smaller, and smaller means less weight. I use the Hitec 5085. They are half the weight of a standard size servo, and produce 58 in/oz of torque, which is an more than enough for this application based on Radio South's torque calculations. In the old days, only one 48 in/oz servo drove two ailerons if I remember correctly.

So ready to cover, less servo and horn, the wing half weighs 8.5 ounces or 244 grams. Covered it's 10.2 oz or 291 grams. Ready to fly with servo and lead, horn and CF control rod to the servo, the total weight is 11.4 oz. **The total wing weighs 22.9 oz (less than 1 pound 7 ounces)** ready to fly, and that boys and girls, is a very light wing, so have fun "going light." 13



# SPA Member Profile—Frank Cox

Name/SPA Number: 651

City/State: Grand Prairie, TX

Occupation/Former Occupation: Retired Police Officer

Years in Model Aviation: Since age 8. I first became interested in models when I saw this guy flying a control line model on the school grounds. I started saving my money and doing odd jobs to buy my first Sterling Ring Master. In 1996 or 97 work took control of my life and I left the hobby for 20 years. I just returned to the hobby the year before I joined SPA.



When did you join SPA: 2014

How did you find out about the SPA and why did you decide to join?: I found out about SPA through RC Universe and friends in the modeling community. I had competed in the 70s and 80s in pattern and even became a CD with the Fort Worth Thunderbirds.

Are you or have you been a full-scale pilot? If so, when, where and what do you fly?: I have never been a pilot of full scale aircraft. However, while in the U.S. Air Force, I did get to pilot a few aircraft from the right hand or front seat.

Favorite pattern planes and why you like them: My favorite pattern planes are Super Kaos, Deception, Bootlegger, Vertigo II, EU-1A, and Tiporare.

Do you or have you competed in other organizations-have you gone to the NATs: No

Something others may not know about you: I love airplanes. (We know—editor)

## SPA EAST SCHEDULE

Aug 4-5	SPA East/West Shootout Clover Creek Aerodrome <a href="#">Scott Anderson, CD</a>	Toone, TN
Aug 25-26	25th East Tennessee SPA Championships <a href="#">Phil Spelt, CD</a>	Knoxville, TN
Oct 6-7	2018 SPA East Masters <a href="#">Scott Anderson, CD</a>	Chattanooga, TN

## SPA WEST SCHEDULE

Aug 4-5	SPA East/West Shootout Clover Creek Aerodrome <a href="#">Scott Anderson, CD</a>	Toone, TN
Sept 15	Wichita Falls SPA <a href="#">Bob Redmon CD</a>	Wichita Falls, TX
October 13	Seagoville SPA <a href="#">Pat Ensign CD</a> & Mike Clements	Seagoville, TX
Nov 10-11	SPA West Championships <a href="#">Ken Knotts &amp; Gary Alphin CDs</a>	Benbrook, TX

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