



Happy February

Well, it's certainly been a tumultuous month of January with everything happening in DC! Here in Michigan, winter has settled in. The field has been in great condition for flying with big wheels, skis and floats with just enough snow to be fun. The driveway has been passable to front and four wheel drive vehicles but I wouldn't take a rear drive vehicle in if it was me! Although, if you can get up the entrance hill you should be fine getting out. Just make sure you brake early on the way out. I almost found myself repairing the gate a few weeks ago as I slid down the hill!

On January 28th we had our first virtual all club meeting for the year. It went very well with 23 attendees by my count. Joe Rubenstein talked about his experiences owning and operating a laser cutter. He has found that he needed to put his laser in a room off his garage and vent the fumes outside.

Personally, I have enjoyed building a kit from his design and cutting skills (see cover photo). Went together great! It's a redesign of the Q-Tee trainer by Lee Renaud originally published in the January 1976 RCM magazine. It was also kitted by Airtronics. Joe's version adds ailerons and removes the dihedral to result in a great flying sport aerobat. I set mine up with flaperons for extra fun.

Also at the zoom meeting, we had 5-6 other guys talk about their current projects. Was a great time and I look forward to hosting another meeting on February 25th.

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As you should know from emails, we are able to restart indoor flying on February 2nd. Hopefully, we will be able to stay open through the end of April. Due to the uncertainty, the EOC decided to refund all the outstanding credits we had for unused punch cards and season passes. To simplify the operation, we decided to run the rest of this season as we always run the late April sessions. \$10/pilot per day. Keeps it simple and makes it much easier for Greg Brausa to be the onsite event director while Fred Engleman and I stay on top of the paperwork behind the scenes. Thanks, Greg for stepping up in our absence!

Stay Safe,

Pete

Pete Foss, President, Skymasters RC

president@skymasters.org

Notice:

Please continue to observe social distancing and wear a mask if you are closer than 6' to anyeone.

######

At the field, don't forget to sign IN and OUT!

Front Cover

Q-Tee, laser cut by Joe Rubenstein and built and flown by Pete Foss.

Pete Foss photo



Control Line Fierce Arrow Wing Construction

As those who read my articles know I've been absent from Skywriter for a couple of months while I dealt with my bowel cancer surgery. The surgery itself went fine but I had a number of issues in the aftermath that are mostly behind me now. So it's time to get back to the business of building model. **Woo hoo!**

So, for the past many months I've been writing about my FW-190 F8 project that I will be flying in the Control Line Scale nationals this June. That project is nearing completion and there are only a few small details left to be done prior to doing an article on painting the model. They are not worth writing about so this month I'll be working on a new project. The project is a vintage control line flying wing called the Fierce Arrow. The Fierce Arrow was designed in the late 1950's by "Wild Bill" Netzeband, a notable designer, builder and flyer on those days. A construction article was published in the August 1957 issue of Model Airplane News. In those days it had some success in aerobatic competition. What drew me to this model is its unique look. I remember the article and thought it was really cool model but I was not a scratch builder and put it in my mental Rolodex until 2021.

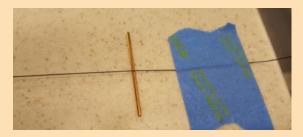


1957 Fierce Arrow. Design by "Wild Bill Netzeband.

I found a couple companies that sell laser cut semi-kits of this model. One of them is in England and their shipped price was substantially lower than the US company. I was shocked when the box was on my porch in just a couple of days.

This semi-kit contains the drawing, a reprint of the MAN article along with all of the parts that have shape such as ribs and bulkheads but no sheet stock, sticks, blocks or hardware. So lets get started.

The Fierce Arrow is a pretty big model. The wing is 810 sq in. In 1957 this model was flown with a Fox .35 so it was built light as the Fox .35 is not known to be a powerful engine. One thing about control line models especially one this large is that they MUST be built straight. There are no trim wheels on the control handle. To get a straight wing you must start with a work surface that is flat without bow, sag or twist. My build surface is an 80" X 36" piece of Corian sitting on top of a solid core exterior door. I have trued this previously but I'll go through how I check for flatness and twist. This is really easy to do. You'll need 5 pieces of 1/16" wire about an inch long and a spool of sewing thread. The first step is to stretch the thread along the length of the table and support it at both ends with two of the wire pieces. Now use a third piece of wire as a feeler gauge along the length of the thread. The feeler wire should just touch the thread. If not, shim the table top to correct the problem. I check both long edges and the middle. Next, stretch two lengths of thread corner to corner to create an "X". Use 4 pieces of wire to support the thread at the corners. The threads should jut touch one another at the "X" intersection. If not, you have a twist that must be shimmed to fix.



Supporting the thread with a 1/16" wire.

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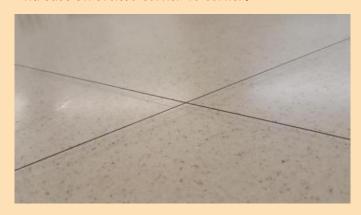
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Wire feeler gauge checking for bow or sag.



2 threads stretched corner to corner.



Intersecting threads must just touch each other at the "X" intersection to check for twist.

You now have a true surface to build on. As a side note, years ago I built a full scale 13 meter sailplane. Each of the two piece wing panels were built on a 20 ft long table that was trued using this same technique. To facilitate the truing I installed leveling bolts every 24 inches along both long edges.

I usually use a steel rod jig to build wings. But in this case, the extreme taper and lack of jig holes in the ribs called for a different approach. Using my table saw I cut a number of MDF blocks to use as rib spacers. I then made some smaller blocks to support the leading

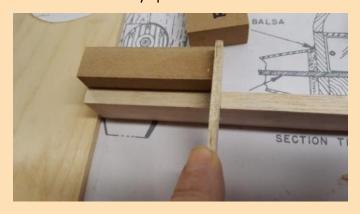
and trailing edge. The size of the blocks was chosen so that the leading edge and trailing edge center lines are the same distance from the building surface.



Spacer blocks.

This technique sets the rib chord line parallel to the work surface. The block size also included an allowance so that the bottom of the center ribs has a 3/8" clearance to the table top. I did this because the bottom of the fuselage is 3/8" thick and just touches the bottom of the wing when assembled. This allows me to use the spacers at final assembly to assure proper fuselage to wing alignment. This method worked well on the Fierce Arrow. Other models may need a different technique. The bottom line here is to use blocks and spacers to set alignments. Now you might ask how I pin things to the Corian work surface. The answer is that I don't use pins. I use blocks and weights to keep everything aligned during the dry assembly. When all of the parts are properly set up I then do the gluing.

On the Fierce Arrow, the trailing edge is notched to accept the trailing edge of the ribs. To do the notching I made a notching tool out of a strip of 1/8" thick material with a 1/8" wide strip of 60 grit sandpaper glued to the edge. I use the rib spacer blocks with the notching tool to make the uniformly spaced notches.

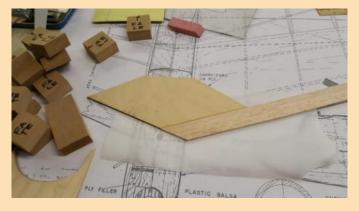


Notching tool with rib spacer block.

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In the case of the Fierce Arrow there is a triangular plywood joiner at the intersection of the left and right leading edges. I made this assembly first.



Leading edge joiner.

With the leading edge and the notched trailing edge I began the assembly of the ribs. As a side note the MAN construction article calls for the wing to be built with the ribs standing up vertically on the building board using long sticks to support the ribs. Just for grins I tried this to see if it would actually work....it didn't.



MAN article building method (NFW)



Assembling the ribs to the leading and trailing edges. Note the use of the spacer blocks under the leading and trailing edges.

The first rib to be installed is the center section rib. Its alignment is critical since the remaining ribs will be located from it with space blocks.



Installation of the first rib. Note the small weights holding the leading and trailing edge pieces against the setup blocks.

The remainder of the ribs are installed using spacers between each.



Adding ribs with spacers.



All ribs are now set.

The next step is to install the spars and stringers. In the Fierce Arrow the upper and lower spars are beveled at the center joint since there is no doubler. <u>Do not use</u> a but joint in a situation like this!



Beveled overlap spar joint.

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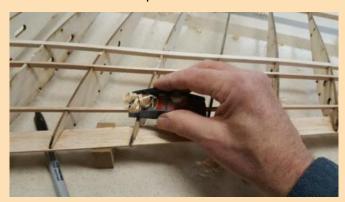
Do not use a but joint like this (very weak).

Next I added the stringers to the top of the wing. These go into laser cut notches. They do not join in the center. These are there to help support the leading edge sheeting.



Stringers are added to the top of the wing.

At this point I glue all of the joints accessible from the top. Because I cut the stringers from sheet stock, I got some variation in size so I used a small plane to trim them flush with the top of the ribs.



Planing the stringers flush with the ribs.

At this point I installed the bellcrank to its platform and

installed it. There is a bolt that holds it in place (critical). In situations like this I put a drop of CA glue on the threads to make double damn sure that it doesn't loosen. Locktite would also work.



Using CA to lock the bellcrank threads.



The bellcrank and platform is installed now.

At this point I flipped the wing over and used the spacers at the leading and trailing edges to keep things straight. I then added the spars and stringers to the bottom side and then glued all of the joints. It is now time to sheet the leading edge. I do not like the way the drawings show the leading edge construction. The design will result in a pretty sharp shape. Sharp leading edge shapes typically have a very sudden stall characteristic. Great for r/c aerobatics when snap rolls are called for....not so much for control line.



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Leading edge construction will lead to a tight (snappy) radius.

To remedy what I think is a problem I decided to put a "traditional" leading edge piece there so that I could make a more rounded shape. To do that I took the wing to my table saw and cut 3/8" off of the front.



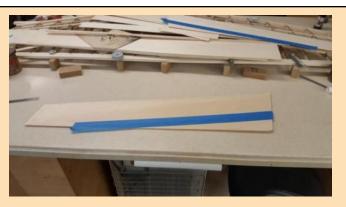
3/8" trimmed from the leading edge.

I then made a 3/8" thick leading edge piece tall enough to allow the 1/16" sheeting to butt up against the back side.



New leading edge added. Sheeting will butt against the back edge as indicated above.

It's time to do the sheeting of the leading edge. The sheeting needs to be about 6" wide at the center section and about 3" at the tip. I didn't have 6" wide stock which necessitated edge gluing a 2" wide triangular piece to a 4' wide sheet. Frequently the edges of balsa sheets are not straight. This requires trimming the edges to be joined with a knife and long straight edge. To do the edge joint I position the trimmed edges tightly together and run a strip of masking tape over the entire length of the joint on one side only.



Masking tape on one side of the sheeting joint.



Joint folded open ready for glue.



Apply glue to the opened joint.

Now, fold it flat again with the tape side against your build table. The glue will ooze out. I use a moistened paper towel to wipe off the excess glue. I then put a strip of wax paper on top of the joint and add some weights to keep the sheet flat.



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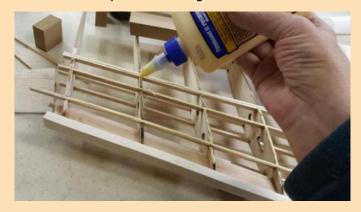
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Weighting the glue joint to keep it flat while the glue dries.



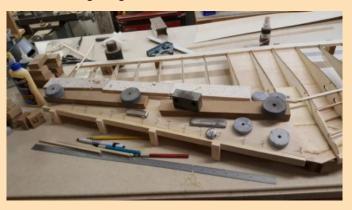
Sanding the glue joint. Use a block sander.

To install the sheeting I used yellow carpenters glue on all of the ribs, spars and stringers.



Apply glue to all ribs, stringers and spars. Use yellow carpenters glue.

Now, apply a bead of glue to the edge of the sheet that will go against the leading edge. In this model I used pins to hold the sheet against the leading edge. In the past, I've used medium CA for this step. Both methods work well but the CA method leaves a hard glue line that can be difficult to sand off. On the Fierce Arrow I used contest grade sheeting (light and soft) and the leading edge piece is harder so I was concerned about the glue line issue and decided for carpenters glue and pins. Anyway, once the sheet is pined to the leading edge I roll the sheet back against the ribs and use weights to keep it down and tight against the ribs.



Weighting the sheeting while the glue dries.

For weights, I have all kinds of lead pieces from my clock projects. But I also use pieces of stone tile left over from a different project. You can go to a tile store and get samples or just buy a supply of the cheapest stuff that they sell.

The center section sheeting is done the same way.



Center section sheeting is added. Weights are used instead of pins.

The bottom of the wing is done exactly the same way but there is a big problem; when I turn the wing over to do the bottom the top sheeting prevents using the fixturing blocks at the leading edge. I felt it was important to keep the wing properly aligned until all of the sheeting is in place. After some head scratching I came up with a different support method. I made a number of balsa blocks and a spacer gauge. I used the gauge to position the blocks which were attached to the leading edge strip with a dot of medium CA.



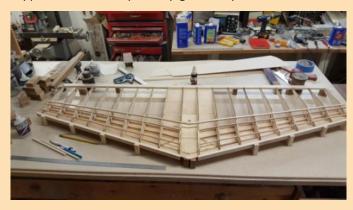
Adding support blocks to the leading edge with a gauge.

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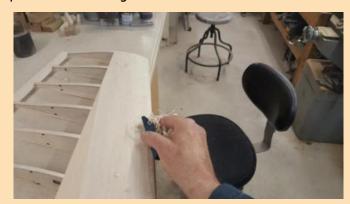


Support blocks temporarily glued in place.



The wing is now inverted resting on the new support blocks and ready for bottom side sheeting.

After the bottom sheeting is finished I remove the spacers from the leading edge and shape it with a small plane and a sanding block.



Planing leading edge to shape.



Final shaping and blending with sanding block.

The final construction step is to finish and install the laser cut flaps. The flaps are 1/4" thick so the first step was to taper them towards their trailing edge. I leave them 1/16" there. I also use a plane and block sander to bevel the hinge line to 45 degrees. The flaps are large so I cut lightening holes in them using a forstner bit to remove most of the material and a drum sander to finish the openings.



Removing excess material with Forstner bit.

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Smoothing the hole with a drum sander.

Now for the (not so) fun part: hinging. For control line models I have stopped using CA type hinges because it leaves the control surface too stiff. A control line model has a limited amount of force available to move the control surface. I've switched to pinned joint hinges exclusively. For the Fierce Arrow I decided to use Robart hinge points. These go into a 1/8" drilled hole in the flap and trailing edge. Sounds easy right? Well, these take great care in making sure they are aligned properly or they will bind. First, the holes must be centered in the thickness of the flap and trailing edge. Second, the hole must be square to the hinge line. Third, the spacing along the hinge line must be exactly the same between the hinged parts. To accomplish this I drill the flap first using a drill press and vice. I use a small spirit level to make sure the hole will be square to the hinge line and I use an awl to dimple the location to help keep the drill from wandering. I make all of the holes this way.



Dimpling the hole location with an awl.



Using a spirit level to square the flap to the drill.

To drill the holes in the trailing edge I obviously can't use the drill press. Instead, I made a block with a 1/8" hole made in the drill press. The hole is located to exactly align with the trailing edge hinge line. Now I use the block to make the <u>first</u> hole in the trailing edge.



Drill alignment block keeps the hole centered and square to the trailing edge.

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After the first hole is drilled I insert a hinge point in the hole to keep the flap in position. Now I make a locating marker by sharpening a 1" long piece of 1/8" wire that I insert in the next hinge hole in the flap. I press the sharpened marker into the trailing edge to transfer the hole location.



Sharpened pin is used to transfer the location of the next hole.

The drill locating block is used to drill the hole in the new location. This is done for all of the holes. There is one more thing that I do. You will notice that the hinge points are larger than 1/8" in the center. To deal with this I use a rat tail file to make a semicircular notch to clear the fat area. This also helps keep the glue away from the hinge pivot. When covering with film, I use my trim iron with the rounded end piece to seal the film into the notch. I then use a heated piece of 1/8" wire to open up the hole.



Hinge point is fatter in the center.



Filing a clearance for the center of the hinge.



Completed hinging of the flap.

And here is the finished wing (ready for final sanding).



Finished wing. The flaps are propped up with a space block for this picture.

So that's it for this month. For next month I'll build the fuselage and fit it to the wing. I will be constructing the fuselage so that it can be covered as a separate piece like an ARF. Trying to cover the assembled model is much more difficult.

Steve



Time To Spare, Go By Air

Part 2 - Finding a Way To Keep FLying
By Ken Gutelius

Last month, I brought you along for the ride while I trained for and obtained my private pilot certification. Instructors and pilots will tell you that the certificate is a "license to learn." Having it doesn't mean you know everything about flying. But now, aside from FAA required flight reviews and any recurrent training you choose to do, you will be learning on your own. You won't have the safety net of an instructor sitting in the copilot seat.

Having graduated to full-fledged pilot status I needed to decide how to continue flying. Renting from the same flight school was a short-term possibility. Joining a club was another. Partnerships also work well for many. Individual ownership was my ultimate dream but seemed intimidating and out of reach. The options above are roughly in order of increasing cost, responsibility, flexibility and availability. Flexibility and availability are the key reasons to accept the additional cost and responsibility. Having a shiny toy is also appealing but not a convincing argument to a skeptical spouse.

When I first received that coveted private pilot certificate, I rented for a period of time. The flight school where I trained shut down not long after I passed the instrument checkride. However, the school owner did have one plane that he continued to rent to a limited number of former students, those he trusted not to abuse it. There was no longer an online scheduling system and we checked availability by texting each other.



A Cherokee 140 similar to what I trained in and rented

This arrangement kept me flying but was limiting. The plane was relatively slow, of low payload and sparsely equipped. On the bright side, although it looked ratty, I knew it to be well maintained. I had participated in some of the maintenance work and knew that everything was done thoroughly. Going well above and beyond the FAA inspection requirements kept this school's planes grounded longer when they were inspected or repaired. Sometimes this was frustrating when a plane was unavailable but after renting from a couple of other flight schools, I gained an appreciation for the thorough approach. The other planes I rented did not always inspire confidence.

To find a more tenable long-term arrangement, I made an effort to find a partner or partners to share a plane and its expenses. I found some who seemed willing but ultimately nothing panned out. After many months of potential partnerships and other arrangements falling through, the decision was made to pursue individual ownership. I've been asked many times where one finds a wife who will agree to such a thing. All I will tell you is to look in the general vicinity of the Lost Dutchman's Mine and the Fountain of Youth.

The decision on which model to pursue was not at all difficult for me. One of the planes I trained in was a Grumman Cheetah. To me it stood head and shoulders above the various Pipers and Cessnas I flew as a student or renter. The Grumman line features nimble handling, excellent speed, great visibility and a sliding canopy that eases ingress/egress while providing generous ventilation. The Cheetah's more powerful sister is the Tiger and that's what I wanted. There is a link at the end of this article if you are interested in more detailed information on this type.

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The sliding canopy and folding seats allow loading flexibility in addition to ventilation and a great view

If deciding on my dream plane was easy, finding it was not. Any Tiger that is listed at a reasonable price will be sold within hours. The timing finally worked out when N28657 appeared on Barnstormers.com. I called the minute I saw it. By the end of the day the owner was calling me back to be sure I was serious since he had 3-4 others in line. The plane had everything I wanted and nothing I didn't. The interior and exterior were in good if not perfect condition. The engine was solid and the instrument panel was slightly outdated. That last item was key for me because I wanted a plane equipped for IFR (instrument flying; see my article from the December 2020 Skywriter). I didn't want to pay extra for a panel that was sort of adequate. I wanted to equip it my way.

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Outdated avionics destined for removal

This is where the title of this series of articles will begin to make sense. A purchase agreement was reached in May and I had visions of a summer full of flying, free at last to bore holes in the sky at the slightest whim. What I got was a summer of waiting. The broker for the previous owner did not do a proper title search. There were two 30+ year old liens against it that had not been cleared. The process of obtaining lien releases took until September. The next time I saw the plane in person was in late October.

When it came time to find a hangar, I started with Romeo State Airport. It's closest to my house and it is non-towered. Having trained at a non-towered airport, I was accustomed to that type of operation and most comfortable with it. However, I was not satisfied with the lease contract and ended up at Pontiac (Oakland County International). I've discovered that flying out of a towered airport such as Pontiac is still fairly convenient and the controllers very accommodating and professional. Towered airports are also more integrated and convenient for instrument flying.

I ended up choosing, by chance, a hangar right next to another Grumman. This was a happy coincidence and I've become friends with the owners, Pat and Jenny. We will sometimes fly places together and Pat serves as a safety pilot when I need to get some instrument practice "under the hood." We also help each other out with aircraft maintenance and repair. I have a key to their hangar in the event I need to borrow from their extensive tool collection.

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"Grumman Corner" at Oakland County International Airport

With the plane in my possession, you might assume that I was free to do that sky-hole-boring previously mentioned. Well, not quite. While the FAA and any instructor I had worked with considered me qualified to fly a Tiger, my insurance company did not. They were concerned about my ability to tame the extra 20 horsepower compared to the Cheetah I had spent many hours flying. Therefore, they insisted on 3 hours of "transition training" before they would cover me. My instructor/broker graciously included the training in his commission and I got a biennial flight review (FAA required) as part of the bargain. Two days before Halloween, I finally delivered the plane to its new home, touching down 15 minutes before the airport and the surrounding airspace were shut down for the arrival of the vice president of the United States.



The day N28657 arrived at Pontiac

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Bringing home your very own airplane is akin to acquiring your first house, car or boat. It's a wonderful feeling but with a tinge of trepidation. One of the key differences is that it's not nearly as common an experience. You can talk to almost anyone about the headaches of home or car ownership. And many of those people will be happy to offer advice whether you want it or not. With airplanes, you can read magazines and blogs to get an idea of what ownership is like, but it feels a lot more like uncharted territory. The chances that your next-door neighbor owns a plane are almost nil. Since you can't talk to your neighbor about it, next month I will give you my perspective on the ownership experience.



Getting lunch with the neighbors

https://www.flyingmag.com/story/aircraft/approachable-aircraft-grumman-aa-5/

Ken Gutelius





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OCTOBER:

Flying sessions start at 10 am and end at 1: PM *

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Please Bring Proper Change For Payment.

NOVEMBER:

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Tues. 3rd

Tues. 2nd

Tues. 10th

Tues, 9th

Tues. 17st

Tues, 16th

Tues, 24th

Tues, 23th

DECEMBER:

MARCH:

Tues. 1st

Tues. 2nd

Tues .8th

Tues. 9th

Tues, 15th

Tues. 16th

Tues, 22nd **TBD

Tues, 23th

Tues, 20th **TBD

Tues, 30th

JANUARY:

APRIL

Tues, 5th

Tues. 6th

Tues, 12th

Tues. 13th

Mon. 18th MLK Day

Tues, 26th

* <u>Dates & Times</u> <u>Subject to Change or</u> <u>Cancelation Without Notice</u>

For rules & additional information go to: www.Skymasters.org
You can contact the Event Director at: lndoorfly@Skymasters.org

ON THE WING



Indoor Flying

(AMA required - Click this link for more info)

Every Tuesday 10AM - 1PM

Ultimate Soccer Arenas

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Notice:

The Retirees and Wannabes Breakfast At Red Olive

Is cancelled until further notice due to COVID-19

Notice:

The Skymasters Breakfast At Iris Café

Is cancelled until further notice due to COVID-19

Other local area indoor flying

Premiere Sports Center

14901 23 mile, Shelby Twp, MI

(northwest corner of 23 mile and Hayes)

Every Thursday, 9AM to 3PM

Electric planes and helis (separate heli space) \$10/session, AMA required

Info: Steve Durecki 586-246-4203 (text or voice)

http://www.stevesindoorflying.com/

February 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2 Indoor flying 10AM-1PM Ultimate Soccer	3	4 Indoor flying 9AM-3PM Premier Soccer	5	6
7	8	9 Indoor flying 10AM-1PM Ultimate Soccer	10	11 Indoor flying 9AM-3PM Premier Soccer	12	13
14	15	16 Indoor flying 10AM-1PM Ultimate Soccer	17	18 Indoor flying 9AM-3PM Premier Soccer	19	20
21	22	23 Indoor flying 10AM-1PM Ultimate Soccer	24	25 Indoor flying 9AM-3PM Premier Soccer Skymasters Meeting (virtual) 7PM	26	27
28						

Skymasters Information..

The Skymasters field is located in Lake Orion, within the Bald Mountain Recreational Area on Scripps Road, between M24 and Joslyn (see map). A recreation passport or sticker is required and can be obtained from the Park Headquarters located on Greenshield Road or you can check the box on your tab renewal for a "Recreational Passport".

Flying hours:

QUIET ELECTRICS ONLY from 8AM to 10AM and 8PM to 10PM. The noise limit is 80dBa at ten feet. Regular flying is permitted between 10 AM to 8 PM. The noise limit is 94 dBa at 10 feet. These noise limits are enforced.

Student Instruction & Pot Luck Every Wednesday, May through September. Flying any time but we eat at 6:00 p.m. - rain or shine, literally! For those participating we ask that you bring something for the grill enough to feed (at least) you and
your guests -OR- bring a dish to
pass -OR- bring your own (nonalcoholic) beverage. <u>Something for</u>
the grill: The obvious choices are
burgers, sausages/brats and hotdogs
- but other alternatives are welcome.
If you bring it we will cook it! We've
cooked pork tenderloin and chops,
salmon, venison burgers, steaks and
more. Don't forget the buns.

We start cooking about 5:30 p.m. - having grill items by then helps us get everything ready on time.

Potluck dish to pass: Don't know what to bring, working late? Each week we'll let you know what is needed for the next week from plates to condiments, charcoal, etc. Pick one of the needed items to bring instead! Not one to cook? A quick stop at local supermarket deli

for a side salad, or bakery for dessert always works!

From June through August, club meetings are held at the field, on the second and fourth Wednesday of the month at 8 PM. A great chance to fly and socialize. Winter meetings (September through May) are held at the Orion Center, 1335 Joslyn, in Lake Orion. Bring a model for Show and Tell, enjoy coffee and donuts and listen to the speaker of the evening.

The Skywriter newsletter is available online at the Skymasters web site and is free to all. It may also be printed from the web site if desired. All contributions are welcome. Please send photos and articles to newsletter@skymasters.org If you know of anyone who may be interested in R/C Aviation, please give them a link to this newsletter or give them a copy of an AMA magazine. It may spark their interest!

