



THE MAX-OUT

Newsletter of the Magnificent Mountain Men

AMA CHARTERED CLUB #177

Issue 2024-03
(May-June)



Indoor Free Flight:
Sometimes you just have to take it to the floor.

In this Issue

- Upcoming Events
- The President's Corner
- Round Valley Dome Contest
- Pikes Peak Ceiling Climb Results
- April non-Scramble report
- Field Report
- Nametag badge offer
- Projects and New Builds
- May Scramble Report
- Composite Parts—Part 1
- 14 Rounder Flyer
- Indoor at Beth Eden Flyer

Upcoming Events

14-Rounder—13-14 July

Casino Cup	15-17 June	Jack Murphy
Beth Eden Indoor	21 June (Fri)	John Christensen
14-Rounder	13-14 July	Pete McQuade John McGrath
Beth Eden Indoor	19 July (Fri)	John Christensen
August Scramble (Late Day)	18 Aug (Sun)	Darold Jones

MMM Club Officers and Contact List

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Club Points Monitor:

Jeff Pakiz 303-337-9188

Newsletter & Website:

John McGrath 719-963-9227



The President's Corner

By Pete McQuade

One of the highlights of April was receiving an email from **Marc Sisk**, a great friend and past president of the MMM. He says “Hello!” to everyone in the club. In his tenure at the helm, Marc was much appreciated for his good judgement, his decisiveness, and his hard work and dedication to Free Flight. I’ll never forget him handing his fully-wound P-30 to the State Land Board’s Mindy Gottsegen, who put up a nice max on her first-ever flight. She was all smiles. And everyone in the MMM thoroughly enjoyed the series of Annual Meetings at Marc and Carol’s beautiful home in Black Forest. (Remember that great home theater?) He and his wife Carol now live in Kansas City, where she has family. This also puts them reasonably close to Wichita—and three of their five grandchildren. Still dealing with some health problems he experienced while living in Colorado Springs, Marc is devoting time to the N-scale model railroad in his basement. Thanks for reaching out, Marc! Please know that you are well remembered and admired.

Also in April, Don DeLoach guided us through another successful Pikes Peak Ceiling Climb. Thanks for all your hard work and great organization, Don! On the other hand, April’s outdoor flying scene was just downright tough. For the April 28 Scramble, heavy rains had left the field swampy, especially the dirt access road. So, following our club’s weather-cancellation procedures, CD Jace Pivonka appropriately postponed the contest until the following Sunday, May 5. However, high winds that day forced outright cancellation of the April Scramble. The silver lining in that “cloud” of bad breaks was that our club procedures for deciding when to postpone and how to notify the club worked well. Hats off to our CDs!

But the May 19 Scramble was just the reverse. CD Rick Pangell must be living right, because despite a forecast of breezy conditions (even on the almost-always-dependable WindAlert website) that Sunday was one of those free flight days you dream about. Mostly sunny skies, light winds, nice thermals, and a field in beautiful condition! Everybody I saw there had a great time. This was also the first time we implemented the **new Scramble rules** that the club adopted at the Annual Meeting in January. (Thanks to Jace, John, and Chuck for that much-needed Herculean effort.) Remember, from now on, we fly each event “to its official AMA/FAI/NFFS/SAM rules,” rather than to our old, modified rules. Also, there’s now a cap on the number of maxes the winner will be able to rack up above the second-place flier. This is to prevent one huge string of maxes essentially deciding the Season Scramble results. Hopefully, this will keep things more competitively interesting throughout the season. However, if you’re on a roll and building a string of maxes one day, keep it up! We’ll keep recording your maxes—because club and AMA records may be calling your name! That’s part of the beauty of “flying to the rules.”

Now we can all set our sights on the June 9 Scramble, the Casino Cup, and the following month’s 14-Rounder contest. Hey, let’s go flying!



Tom goes flying with a Tiny Glider. Got a problem?

Springtime in the Dome, 2024

By Jerry Murphy

Photos provided by Tom Gaylor

Once again, the MMM club took a major risk on the club's reputation by sending two old engineers to carry the club's flag to the Round Valley in Arizona. Rick and I decided the world would be a better place if we took off a day earlier so we could get in some test flying. With this plan, Rick came down from the Mile High city on Wednesday evening. We loaded the trusty old Honda Odyssey and settled in for an evening of gin and tonic to prepare us for the next day's travels.

Thursday morning started with breakfast with a group of my Manitou buddies known as the Knights of the Round Table at Mo's. The group consists of an architect, lawyer, newspaper publisher, Mayor of Manitou and me. Rick fit in well, as he could shoot the bull with the best of them.

After enjoying the fine food at Mo's we hit the road for the Round Valley. I forgot to mention that I have a friend here whose sister lives in Springerville. She asks if we could take her with us. Sure, we had plenty of room in the van as Darold was not interested in making the trip. It turns out that her sister was going to be out of town so my friend cancelled out. Next year!

Springerville. We arrived in time to get all of our model boxes and assorted gear unloaded and deposited on the floor of the Dome.

It was off to dinner then a good night's sleep before the Friday trimming session. The "good night's sleep" turned out to be a bit of an adventure. Rob Romash had rented a place that was advertised as "sleeping 4". Well, the actual sleeping accommodations were two queen beds. I was not interested in sharing a bed with Rick, and I wasn't going to do so with Rob either. I called the Best Western and got Rick and me a room with TWO beds! With the models unloaded and our sleeping



arrangements solved we were now ready with a G&T and bed. Tomorrow will be our test and trimming day.

The Flight Line

Mike Fedor arrived about the same time as we did. He was staying in the Howard Johnson's hotel. This hotel was previously the Rode Inn. The good news about Mike's choice is it had a full-service bar just off the lobby. We made plans to meet there Saturday evening for drinks before dinner. The MMM Club is well known for running contests that are a bit on the laid back style. I can tell you that Tom Gaylor learned well and his contest was one with very low stress and lots of good flying. Thanks Tom.

Saturday morning arrived with bright blue skies and light winds. Why are we messing around with indoor models on a day like this? Well, it is because we didn't bring anything else. We had breakfast in the hotel then were off to the Dome for a day of fun and folic.



World Champion Brett Sanborn preps his F1D

The trip down was uneventful as contrasted with the motorcycle wheel problem on our way home from the Eloy contest. Lunch at the Spick and Span restaurant in Las Vegas and then a smooth ride into



Hamish Christie and his A6 (with a 3-bladed prop??)

Entries were down a bit however the quality of flying remained high with the setting off four new site records. We also had a new junior from Santa Fe, Tiger Wagner flying his P-18. Tiger was working on his trimming to hone his skills for the upcoming Science Olympiad.



Tiger Wagner with what looks like a C-Div Sci Oly model

As had been in previous events in this site the day was divided with gliders flying in the early part of the day and the light models flying later. Other highlight of the day was the battle for supremacy in Pennyplane. Mike Fedor won the Open event with a time of 10:54 while Rob Romash took the honors in Limited Pennyplane with a time of 10:50.

Another event that was fun was how Rick Pangell used his Jet Cat to record the high time in all three of the catapult glider events with a total of two minutes and two seconds. (2:02)

I believe the low point of the contest was the loss of Brett Sanborn's world champion F1D to the speaker wires. Brett went on to show us what a true champion he is by winning both the F1D and F1L, setting a new site record with his F1L.

The new site records are:

A-ROG 9:02 by Paul Avery

F1L 32:32 by Brett Sanborn

FAC Peanut 3:24 by David Wagner

P-18 4:06 by Hamish Christie

The P-18 times were phenomenal with the new site record of over four minutes. The Junior site record of 3:53 was set back in 2019 which shows how the performance of these simple models can be obtained with good trimming.

As the contest drew to a close, we adjourned to Molly Butler's in Greer for a wonderful steak dinner. On the subject of dinners, Avery's BBQ has changed hands. The new owners changed the name of the place to be The Gateway. We had dinner there one evening and I am happy to report the food was still the same high quality we had come to expect.

As has been the usual practice, Rick and I remained to help Tom with the build-and-fly event for the local students. It is always fun to see the look on the student's faces when they saw their model actually fly. The highlight of the event was the mass launch. The students really enjoyed this as demonstrated by their shouts of joy.



Students build Mountain Lions

Thanks to Tom and his crew from the Phoenix club. See you next year.

18th Pikes Peak Ceiling Climb
4/7/24 - Manitou Springs, Colorado
Cat I - 25'-3" CD—Don DeLoach



Frank's P-18—forward swept winglets!

HLG
 Sean McEntee 51.0



Don DeLoach 47.7
 David Aronstein 6.3

Rick Pangell—Taking in the scene

Std. Catapult Glider
 Sean McEntee 38.6
 Rick Pangell 26.2
 Don DeLoach 13.7

Unlimited Catapult Glider
 Rick Pangell 23.9
 Sean McEntee 23.6
 Don DeLoach 13.5

FAC Jet Cat Scale
 Tom Norell 33.9
 Rick Pangell 25.3
 Don DeLoach 7.2

Tiny Glider
 John Christensen (2.65") 5.50
 John Christensen (5.435") 5.22
 Tom Norell (1.72") 5.00
 David Aronstein (14") 0.47

WASP
 Tom Norell 1:10
 John Christensen 1:02
 J. Christensen (#2) 0:57



Is it just me or is that port wing a little wonky?

Phantom Flash 5g
 D. DeLoach 1:42
 Sean McEntee 1:16
 Chuck Etherington 1:16
 Jace Pivonka 1:14

A-6
 John McGrath 3:35

P-24 Mass Launch
 Tm Norell 1st
 Chuck Etherington 2nd
 Frank Menanno 3rd
 Rick Pangell 4th
 Sean McEntee scratch



Chuck, do I use the big one or the little one?



You can take the man out of F1B, but you can't take the F1B out of the man. Jace winds his Phantom Flash like he means it!



Sean warns his Wildcat not to misbehave

P-18 Mass Launch

- Chuck Etherington 1st
- Don DeLoach 2nd
- John McGrath 3rd
- Sean McEntee 4th
- Jace Pivonka 5th
- John Chirstensen
- Mike Nelson



Chuck takes the P-18 mass launch!

WW2 No-Cal Mass Launch

- Sean McEntee 1st
- Rick Pangell 2nd
- Don DeLoach scratch

Phantom Flash Mass Launch

- Don DeLoach 1st
- Sean McEntee 2nd
- Chuck Etherington 3rd
- John Christensen 4th
- Jace Pivonka 5th

Easy-B

- David Aronstein 5:40
- Bernie Olsen 5:36

Ministick

Tom Norell 2:46



Left to Right: Mike Nelson, Don DeLoach, Bernie Olsen, John Christensen

Bostonian

John Christensen 1:19



A P-24 Condor—looking majestic!

P-24

Chuck Etherington 1:54

Frank Menanno 1:26

Rick Pangell 1:19

F1M

Mike Nelson 4:23



David's Super Tucano circles up high, looking for a fight!

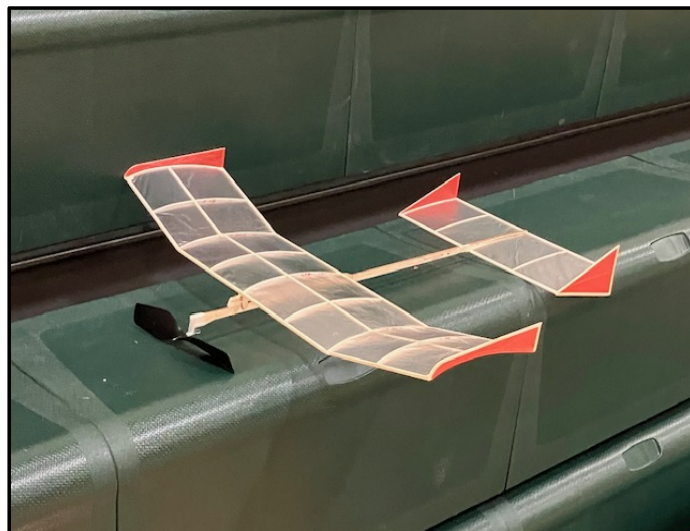
FAC No-Cal

Sean McEntee 1:24

Bernie Olsen 1:18

Rick Pangell 1:02

David Aronstein 0:49



David's P-18—Cool!

P-18

Tom Norell 2:40

David Aronstein 2:33

Don DeLoach 2:26

Sean McEntee 2:05

Mike Nelson 2:01

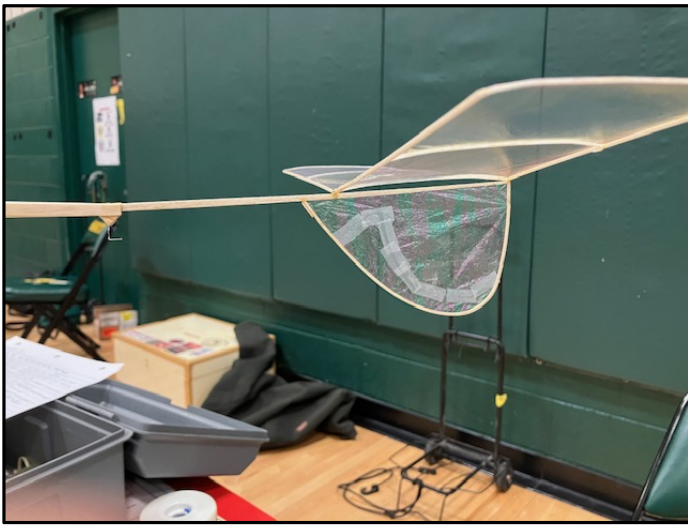
John McGrath 2:00

Chuck Etherington 1:36

Jace Pivonka 1:36

Frank Menanno 1:34

John Christensen 1:14



Tom's BAT Monoplane—unbelievable detail!

Word of the day: "Repairmanship"
Don's LPP

Limited Pennyplane

Don DeLoach 5:46
John McGrath 3:26
Mike Nelson 3:23

FAC Peanut Scale

Tom Norell 137.0
John Christensen 127.0
Don DeLoach 121.0

FAC Dime Scale

Tom Norell 28
Jace Pivonka 13

Grand Champion "Colorado Cup"

Tom Norell 17pts
Sean McEntee 15
Don DeLoach 13
John Christensen 12
John McGrath 9
Rick Pangell 4

**Congratulations,
Tom! Well done.**

April Scramble?

By Jace Pivonka, CD

In typical Colorado fashion, the weather refused to cooperate for the April scramble on either of the two dates we attempted to fly. On the originally scheduled date (4/28), the weekend brought a blanket of snow across most of the field and cold rain when we arrived at the field on Sunday morning. Because of safety concerns surrounding chasing, damage prevention on the access road, and generally unpleasant conditions, the contest was pushed back one week to 5/5.

Unfortunately, the following weekend brought a different but equally poor set of conditions with strong winds throughout the morning and the expectation that they would only continue to increase during the day. Again the contest was cancelled first thing in the morning but that didn't prevent a couple of the fliers in attendance from making practice flights with their new E20s. Frank Menanno and John McGrath both made at least one flight, all with significant chases. We were also able

to admire some of the scale models that Jeff Pakiz has been hard at work on. Despite the poor forecast and contest cancellation, there were still six cars on the flight line in the morning. Hopefully the enthusiasm for outdoor stays high and we can double or triple that many fliers for the May scramble in two weeks on 5/19!



Free flight boy band? No—it's the turnout at the April non-Scramble, 2nd attempt

Field Report

Editor's note: Each year the State Land Board convenes a meeting of all lessees involved with the Lowry Ranch property. At this meeting, the SLB representative gives an overview, then invites leaseholders of the various kinds—Agricultural, Mineral, Recreational—to present information that might be useful to others. The club's Flying Site Coordinator—Chuck Etherington—attends this meeting annually.

Annual Lowry Lessee Meeting 2/16/2024

General Updates (Rachel Turner)

- Multiple stewardship projects and surveys completed, noxious weed treatment, soil erosion projects
- Precipitation for 2023 was 24.17 inches, 60% more than 2022.
- Crosswinds...continuing to work on their runways this summer
- The State Land Board removed the daisy chain locks on the north gate and replaced them with a single lock. The lock combo was distributed to MMM members. Recently, there was no lock present. As always, leave the gate as you find it. Automated gate plans still in the works.

Trainor Cattle Company Updates (Nick Trainor)

- Awarded a new ag lease in 2024 that will last for 10 years

Munitions Cleanup Updates (Scott Sawyer)

- History
 - Was used for military training from 1937-1963
 - 58,000 acres (90 sq miles) with 18 sites used as bombing targets, gun ranges, demo sites, and other activities
- U. S. Army Corps of Engineers' (USACE) continues ordnance cleanup effort. They will first be performing a remedial Investigation/feasibility Study
- Currently working on a desktop review of all previous investigations/removal actions
- Troubleshooting with new technology being compatible with their older data that is already collected

- Due to the saturation of 20mm and .50 caliber ammunition (non explosive), the scans of the explosive ordnance in the ground (below 6") have been difficult for GPR to be effective. The process of scraping 6" of soil, GPR scanning, and soil cleaning/replacement will continue to be refined. That activity will be confined to the area west of Coal Creek (>1.9 miles from our flying site)
- Actual fieldwork is waiting for the completion of all required safety and project planning documents

Pure Cycle Updates (Brent Brouillard)

- 80% complete bolstering water supplies
- Has been working on a water rights case with Box Elder Creek
- Installed 2 new wells on the property in 2023 along Quincy
- Water Fill Station
 - Automated through a PIN
 - Contact Geoff Greenman for account setup
 - Located at main Lowry Gate

Civitas Updates (Dan Harrington)

- In the development phase for both drilling sites and road improvements on Lowry, lasting from 2024-2026+
- Will be in production for another 20 years (helpful to MMM in protecting the land from developers)

GMT Exploration Company

- Application filed with Arapahoe County for implementing pad with horizontal wells on the surface

Arapahoe Hunt Club Updates (Eric Goltig)

- 160 acres fenced
- Have dog kennels and horse stables on the property
- Active September-April
- Exercise hounds daily
- Dr. Beeman, 90 years old, fell off his horse and cracked two vertebrae. He was still in hospital at the time of this meeting

- Amy McCracken, resident kennel manager, is no longer serving in that capacity.
Replacement unknown

Update on SLB/Arapahoe County Letters of Intent

- Hold off on doing anything new on the property
- Looking at extending the agreement for another three years on the property
- Completing surveys and appraisals
- Open Space
 - Getting a better understanding of the property and trying to find different locations for certain projects
- Nick asked about the 2050 plan and if that is being used, Eliot said that is/was a starting point with more to come out of it

Military Updates—Bentley

- Lowry is very valuable to them regarding training objectives

Norris Ranch site—Abe Medina (State Recreational Lease Manager)

- Met Abe for the first time. Following Don DeLoach's contact with co-lessee, Front Range Outfitters, they contacted Abe to make sure we were legitimate lessees. The contact Don spoke with is also the Norris (T-Cross) Ranch Manager. Abe offered to facilitate a formal introduction in his office.

Chuck Etherington
Flying Site Coordinator

May Scramble

By Rick Pangell, CD

Driving out to the field the wind was pretty blustery. The forecast said it would calm down and I had promised a go-nogo decision by 8:30. When I got there the usual suspects were there before me. I sent out the note on the "io" group:

"I'm on the field and there are about five people out here it has reasonable 10 mph winds with Gusts up to 12:15. I'm not calling the contest off because they're

occasional gusts and but I just wanted to let you guys know it has a tendency. The forecast is to calm down in a couple hours so you make your own choice whether to come out.. Rick"



By 9:30 the wind let up and the flying part of the day was great...!!! I counted 12 cars on the field and a lot of folks pulling models out. Don't let the clouds scare you, they were only passing.

Surprisingly there was a lot of flying but flyers were slow to do official flights. Frank Menanno didn't flinch and started putting up B electric flights with his big yellow model and kept going for 7 maxes. Being the first outdoor contest of the year probably had folks a bit reluctant and I hear the word "trimming" out there too.

Sadly, Don DeLoach put up his screaming gas model with a Cyklon on it and it hit a HUGE thermal; but what does one expect when his timer didn't start. My bad eyes could only hear the engine running... aarrgghh... no DT either..! Two guys had binocs on it but after a while that didn't help.



Good to see Todd Reynolds out again after his hiatus but now going for FIC with a vengeance. Tom Norrell looking on with the “Looks like an indoor model with the flat wing thing going on but it’s not light enough” look.

It’s a great thing, this free flight stuff, and as Dave Lindley, the NFFS Prez so aptly put it... there is always something to do when it comes to free flight modeling.

We had a not so new but rarely seen guy, Ron Lankford come out and fly Embryo. I spoke with him for a bit and his main interest is in FAC but who knows? After witnessing other offerings he may just come around..!



Also, I gotta give a couple of kudos to Jeff Pakiz. He helped me a bunch with timing and he even had a new E-20 from a Josh Finn offering. He was having a bit of trouble with the stab staying put but Frank stepped up and gave him some positive advice.. A bit later it waa flying like a half A. Jeff showed up with a back end full of scale models... a Nieuport with a Snoopy for a pilot nonetheless..!



**The REAL reason Pete flies F1A so well...
Marylin McQuade**



Mark Covington and his F1H



I counted 12 cars on the field and a lot of folks pulling models out. Don't let the clouds scare you, they were only passing.



“Boss Man McGrath” with a beautiful day in the background



Frank won the Scramble but we didn't have a Winner's Sticker for him yet, so John McGrath presented him with his 2023 Scramble winning Trophy which was not presented at the Annual Meeting this year..!

May Scramble Results				
Contest Date:		19-May-24		
Scramble Place	Name	Raw Calculated Maxes	Points this Contest	Season to Date
1	Frank Menanno	7.82	100	100
2	John McGrath	2.51	56	56
3	Rick Pangell	2.14	47	47
4	Sean McEntee	1.98	44	44
5	Darold Jones	1.30	29	29
6	Don DeLoach	1.25	28	28
7	Todd Reynolds	1.00	22	22

"Points this Contest" is the percentage of the winner's Calculated Maxes, with the winner's Calculated Maxes now capped at two more than 2nd place. In the above results, Frank is capped at 4.51 maxes. John's 2.51 is 56% of 4.51.

FAC Tally:

FAC	5/19/2024							TOT
Jetcat	Don DeLoach	LA-150	6	59	19	39		117
Jetcat	Sean McEntee	A-10	45	46	2	15	2	106
Jetcat	Rick Pangell	P-59	22	13	28			63
Embryo	John McGrath	Embryo	65	20	0	0		85
Embryo	Ron Lankford	Embryo	13	22	7			42



Todd Preps his F1C



Rick and Darold—after the contest



Bernie launches his E-36



**Man of the Hour—Frank wins!
And wins...and wins...☺**



XX

TO ALL MMM CLUB SUPPORTERS..!! Time to get Stylin' and Show Off Your Pride

This is your opportunity to have your very own MMM Club Name badge that you have seen on many of our members. This is for everyone wanting to show that you are proud to be associated with the MMM Club, or to show how proud they are of their MMM Club membership!

We are putting together a bulk order with and to be part of that bulk order, we request that **ALL** orders be in to "themaxout@aol.com" by email or leave a phone message to Rick at 720-331-4319 not later than **June 23, 2024** to take advantage of this first order.

The approximate cost will be about \$16.50 per badge, sales tax included. Shipping arrangements for this price will be hand delivery to the recipient when convenient or if mailed the USPS wants another \$6 or so. Please inform us of your intent when ordering and suitable arrangements will be made **Don't pay until your order is confirmed by The MaxOut return email or phone call with the final cost with postage.**

Payment can be made by a personal check to: "The MMM Club" sent to:

Chuck Etherington
33946 Goldfinch Dr.
Elizabeth, CO 80107-7419

or by Paypal to: MMMFFClub@gmail.com and click "services"

After that, the badges will still be available to you, just not as part of this order. Badge requests will still be made through the club but on a one-by-one basis and will probably cost a bit more because of P&H.

XX

Thanks for doing this, Rick!

Projects and New Builds

Jeff Pakiz' Biplanes and Triplanes



Nieuport 27

At the second attempt at the April Scramble, Jeff showed up with a trunk filled with biplanes and triplanes (and one B-57 that snuck in there). My car looks like a bomb went off inside. His looks like a dealer's showroom. Amazing work, Jeff!



Pfalz D3



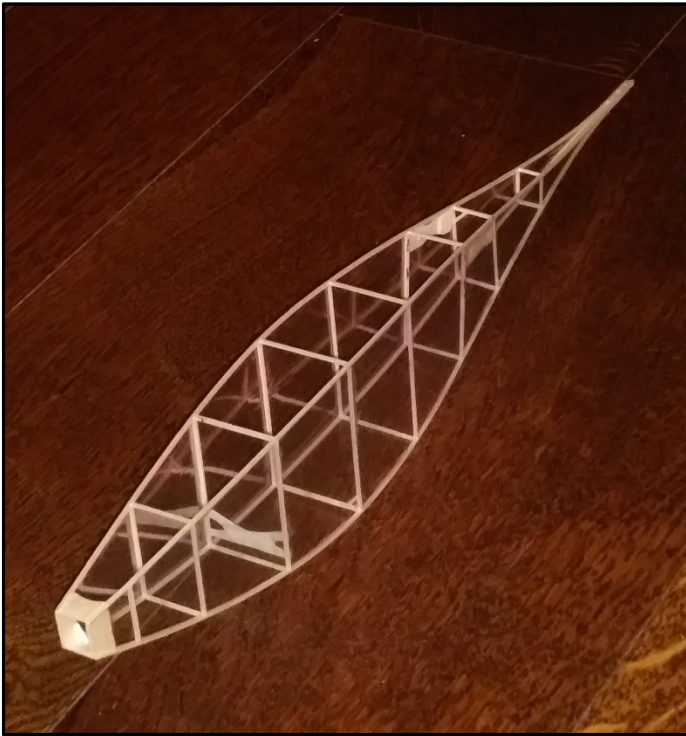
Sopwith Snipe

Jeff used Eze Dope on this one, and the pilot figure is Snoopy. (I hate when models don't have pilot figures. Having a dog at the controls much more realistic ☺)



Sopwith Triplane

David Aronstein's Landing Gear Cassette



From David: "Here's a picture of the fuselage for my Indoor ROG Cabin model, "Pelican II". Can you guess what the exquisitely shaped partial bulkhead is for? Answer below.

will go into Pelican II. It's all mounted on a 1/32" x 1/4" 'pallet' so I can make sure the mechanism is working before I install the pallet in the fragile fuselage. I like it, and the same concept can work on outdoor models. One less rubber band to worry about.

It's a spacer rest. Keeps the front end of the partial-motor spacer from dropping through the bottom of the fuselage! (David—I'm going to have to see it in action to understand it, but knowing you, it weighs negative 2 grams ☺)

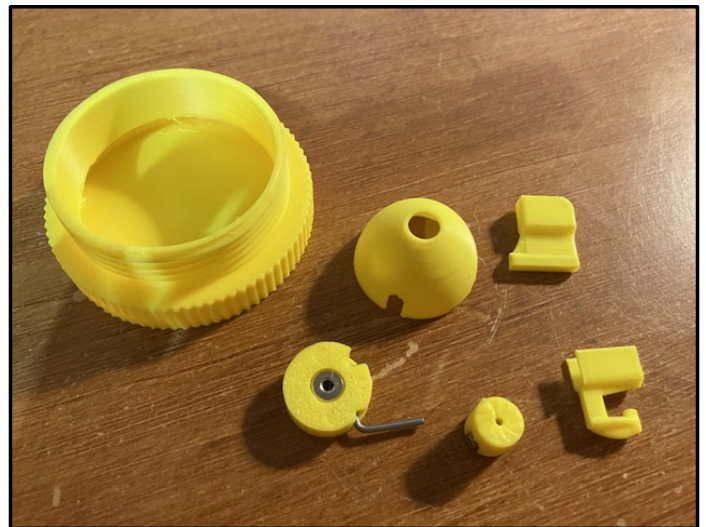


Pelican II? Or 1A?
(photo by Chris Adams)



Also some photos of the spring-actuated retracting takeoff gear. That's from Pelican I, but a similar unit

John M's 3-D printed doo-dads



I finally took a deep dive into 3-D printing, which really means a deep dive into 3-D drafting. In the photo above are a new bottom cap for my streamer pole, a coupe spinner, a .047 shaft indoor hanger, a P-20 rear hook, a front-drive Hatscheck-type P-30

clutch, and in the bottom left, a rear-drive toggle-type P-30 clutch. The clutches use pressed-in wheel collars, and the rear-drive one has been tested up to 30 oz-in (four or five times P-30 torques).



This shows a Coupe Montreal-type hub, alongside my wood-based one from last season. The yellow one's been tested up to 80 oz-in, well more than twice typical Coupe numbers, plus it's a gram lighter. So far I'm in a yellow PLA rut, but yellow makes me happy.

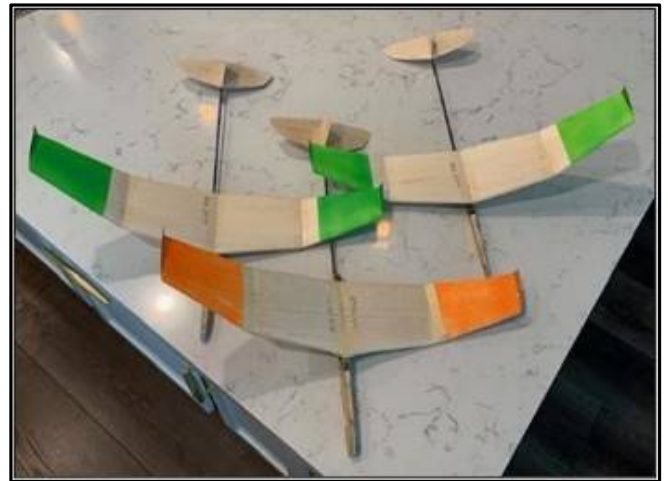
Bernie Olsen's Comet



From Bernie: "Wrapped up construction of this winter's 'big' project; a Comet Sailplane that was designed by Carl Goldberg and kitted in 1940. This one started life as a Bob Holman short kit that was sitting on my shelf for too many years. It's powered by a Saito 4-stroke .40, spans 78-inches and weighs 3 ½ lb. It's covered in UltraCote and the logo on the sides of the fuselage come from the original 1940

drawings. I created a glass mold to lay up the fiberglass cowl which was painted with Klass Kote. Yeah, it has a radio in it and took a couple of months from start to finish." Yeah, it has a radio in it and took a couple of months from start to finish." Gorgeous as always, Bernie! (And radios can be removed, you know 😊)

Bernie's Sting Mk II gliders



Completed another pair of Sting Mk2 cat launched gliders. Built one last year that put up well with my ineptitude so figured I'd give them another try. The fuselage comes pre-assembled and everything needed is in the kit other than glue and paint. Len Surtees sells kits for \$25 and made some small tweaks to the design that saved considerable weight. The first model came in at 40.66 grams and the two new ones press the scales at 31.46 and 32.62 grams. That's an average weight savings of 21%! www.stingmk2gliders.com

Editor's note: We've all known that Bernie Olsen's craftsmanship is in a class all its own, but last month I got a good look at the lightweight fiberglass pylon on his Super Pearl E-36 and was astounded at how clean and well-faired it was. Plus, being translucent, you could see all the stuff inside! I asked if he could give us a short course in his methods, and Bernie came through in spades. As with our best tech articles, Bernie tells us the exact products he uses and gives links as well. Thanks, Bernie!

Molding Composites for Models – Part I

By Bernie Olsen



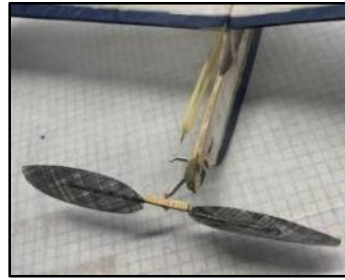
Composites have established a firm foothold in both full-scale and model aviation. Many of the processes for fabricating these airframes are specialized and expensive but the resulting

models provide state-of-the-art performance and are highly desired by today's world-class competitors. Fortunately, we mere mortals are able to harvest much of the benefits using affordable techniques available to the home hobbyist.

By definition, free flight models are already extremely light and don't offer much room for further weight savings. In some cases, however, composites can be used to meet or exceed the weight goal while providing improved aerodynamics, strength, durability and producibility. In addition, molded composites can be made in practically any shape and don't warp under normal conditions. I can't say that for my tissue-covered balsa models.

I molded my first RC sailplane fuselage during the winter of '79/'80 and have applied the techniques on many models since then. Some are pictured here and that first sailplane is shown in the lower left corner. A friend and I

christened it 'Samyel'. The molds allowed rapid construction. We fabricated several of them while experimenting with various airfoils, wing and tail configurations. It was a valuable, fun learning experience.



They performed well at the '81 and '82 Nats and I still fly the original. As MMM members know I'm a

rookie in the world of free flight but would like to offer some thoughts on molding composites for these specialty models. I've already made a couple of attempts using these methods for a molded fuselage pod on an E-36 and a carbon prop on an indoor No-Cal model. Let your mind run and you may have an 'aha' that you'd like to try on your next creation. First, a brief overview of composites then we'll get into the good stuff.

For the sake of this article, composite materials

combine carbon, glass or Kevlar fiber cured into a plastic matrix; usually epoxy, polyester or vinylester. Epoxy is the go-to for models. It's widely available, workable, doesn't shrink and is tougher than the other two esters. I use West Systems 105 epoxy resin with 206 hardener exclusively for fabricating molds and laying up the subsequent shells. It virtually odorless, has adequate pot life and can be mixed by weight, volume or with West's convenient metering pumps. It's available from several sources including CST and I typically consume a gallon kit every year in my shop. www.cstsales.com



Glass is the most commonly used fiber since it's inexpensive, non-conductive, readily available and easy to work with. You'll find it as 'E' or 'S'

(structural) glass although 'E' is most common and more drapable than 'S'.



may degrade their performance.

Finally, Kevlar is non-conductive, it's the lightest of the three fibers and has excellent tensile but poor compressive strength. It is difficult to work with. If you've ever tried to sand a Kevlar panel it'll drive you crazy as it gets fuzzier and fuzzier while you try to clean it up. Kevlar/Carbon hybrid fabrics are also available when strength and toughness are desired. Kevlar can be used successfully in the right application with the right tools but we'll make it simple and just focus on carbon and glass here.

Material forms used for molding models fall into three basic types; tow, woven tape and fabric. Individual filaments are grouped into a unidirectional tow. They're not woven to each other but rather held together with sizing. Tows typically contain 1,000 (1k) to 24k fibers. I use 12k carbon tows for local stiffening while molding shells and for building-up fillets when bonding frames to glass shells as shown here around a firewall on a pattern plane. This creates a very strong joint.

Tows are woven into fabric by weavers. Fabric is rated by its weight (oz/yd²) and style of weave. Plain weaves are most common and strongest since fibers are straighter than other weaves but tend to bridge over sharp features during a layup. Satin weaves are more drapable and lay into complex shapes more easily. They're harder to find in the lighter weaves and cost more than plain weaves.

The cost difference between glass and carbon is eye watering. For example, a yard of 2 oz/yd² carbon fabric runs \$98 (39-inch wide) from CST. Glass cloth of that same weight runs about \$8 per yard from the same supplier. It doesn't take much math to understand why those molded carbon wonder machines are so pricey. National Balsa has recently been offering

fiberglass fabric (0.56, 0.73 and 1.00 oz/yd²) at reduced prices. <https://www.nationalbalsa.com/>

Woven tapes are used to join cured shells and are available in widths starting at 1/2-inch. We'll get into that in Part II of this article.

Carbon and glass veil is also available and is incredibly light when dry (starting at 0.0025 oz/yd²). The fibers are randomly oriented and they can soak up



a lot of epoxy driving part weight. Vacuum bagging can be used to minimize this effect by squeezing out excess epoxy. It's a tempting option none the less when employing careful techniques.

<https://www.rockwestc>

[composites.com/](https://www.composites.com/)

Carboweave is an impressive form of fiber. The product consists of straight fibers loosely laid on top of each other at various specified angles and is apparently held together with sizing. It doesn't soak up excess epoxy and produces very light laminates. How do they make this stuff!? The material is produced in Ukraine



and available in weights starting at 11 grams/meter² (0.3 oz/yd²) up to 60 g/m² (1.8 oz/yd²). Today's lightest RC sailplanes are using this material molded over machined foam cores. I fabricated a pair of spoiler blades with a sandwich of 11 g/m² Carboweave face

sheets over a 1/32-inch balsa core. They came out very light and stiff. The loose fiber density is evident in the photo. <https://shop.cn-models.com/carboweave/>

Another fiber form that's popular with modelers is called spread tow. For this form the weaver expands carbon tow to about 5 times its original width. The resulting ribbons are then woven together into a very light fabric. I haven't personally tried any but suspect it's good for simple curvatures like wing skins or tails but probably tougher to use for layups requiring good drapability such as needed for a fuselage. <https://compositeenvisions.com>

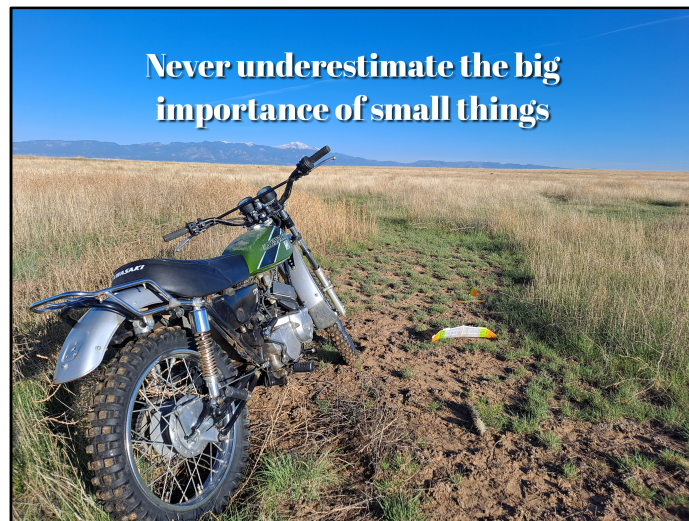
A fourth form of composites that are commonly found on models are the pre-cured laminates: Tubes, rods, tapered booms, strips and panels. They're not typically used during the molding of composites but are often used as spar caps, leading edges, wing joiners and fuselage booms. Many sources exist for these; an excellent one is Windcatcher RC. The owner, Lee Krieger, attended our RMFCC with J&H Aerospace in 2023. <https://windcatcherrc.com>

Given all that background, Part II of this article finally gets our hands gooey. Molding a model is a three-step process. First, start by making a plug of the desired shape. Next, use that plug to produce a mold. Finally, use the mold to make shells for the flying part. Sure, that can take some effort but keep in mind the benefits mentioned earlier for the modeler who's willing to invest the time to go through the steps.

Next Issue: Part II



Mememes by Frank





45TH MMM

JULY 13-14, 2024

14-ROUNDER



Come fly with us at the largest and most beautiful flying site in North America. Within the 14-R are the Centennial and Columbine Cups, separate 7-round FAI competitions. Traditional MMM perpetual silver trophies for F1A-B-C/P-Q and perpetual silver cups for F1G-H-J-S will be awarded based on combined performance over the regular rounds in both competitions. (Ties will be broken with flyoffs.) Only eight MMM Master Sportsmen have earned **Blue Jackets**, since 1980. Earn one by flying a perfect fourteen 180-second maxes over the two days in F1A-B-C/P-Q, or **Legacy F1ABC Combo**.

July 13 (Sat.) - 7 rounds of Centennial Cup: F1A, B, C/P, Q & **Legacy ABC Combo**; 5 rounds of F1G, H, J, S & **Legacy GHJ Combo**

July 14 (Sun.) - 7 rounds of Columbine Cup: F1A, B, C/P, Q & **Legacy ABC Combo**; 5 rounds of F1G, H, J, S & **Legacy GHJ Combo**



AMA/NFFS/OT events: 8 a.m. to 5:30 p.m.

No rounds. In combined events, fly any/all events you wish; we will use your best single event score for awards purposes. HLG/CLG will use launch pen.

Saturday, July 13: Catapult Glider, P-30, Fast Gas Combo*, Andrade Rubber, OT Rubber Combo, E-36, E-Nos. Combo

Sunday, July 14: HLG, Classic Towline, Slow Gas Combo**, Sm/Lg. Nos. Rub. Combo, Mulvihill/Moffet, A/B Electric Combo.

* **AMA Gas:** 1/2A, 1/2A Classic, A, B, AB Classic, C, D and/or CD Classic.

** **Nostalgia:** 1/4A, Early 1/2A, 1/2A, A, B, C and/or MMM SLOP.



Legacy FAI events. Bring out your old FAI models! (Placings and awards separate from "modern" FAI events.) Flown as Legacy ABC Combo, F1A(L)-B(L)-C(L). And Legacy GHJ Combo, F1G(L), F1H(L), F1J(L).

F1A(L): Current FAI rules except no bunt allowed.

F1B(L): 40g motor/190g min, no DPR or VW; OR 35g motor/ 200g min, no DPR OR 50g max motor, 8 oz. min. gross weight, and vintage 1957-1964 Wakefield design.

F1C(L): NFFS Vintage FAI rules. (see < <https://freeflight.org> >).

F1G(L): No DPR and no variable geometry.

F1H(L): Current F1H rules except no bunt; OR 5.08 oz min., no circle tow, no bunt.

F1J(L): 7-sec engine run, no bunt.

Flying Site: Lowry Ranch, Arapahoe County, CO. Near intersection of Watkins Rd. and Quincy Ave. Email for map and gate lock combination.

Contest Hours: Saturday and Sunday, 8 a.m.-5:30 p.m., weather dependent. Flyoffs TBD.

Tentative Rounds schedule: 8:00 a.m. start; first 5 rounds Saturday and Sunday are 90 minutes; final 2 rounds each day are 60 minutes.

Accommodations: Check the MMM website for hotel details. Primitive RV and tent camping is allowed on the site for no fee. No hookups are provided. No dumping is allowed. There is a porta-potty on site.

CDs: Pete McQuade, <petemcqA2@aol.com>, 719-433-5356 & John McGrath, <johnmcgrath2@comcast.net>, 719-963-9227.

Detach, fill out, and mail or email to: Pete McQuade, 2610 Kenton Green Ct. Colorado Springs, CO 80920

Name _____ Country _____ AMA # _____ Entry Fees enclosed \$ _____

Entry fees: \$20 for first event, \$10 per each additional event. \$50 maximum (\$10 for Jr./Sr.) for unlimited events, or \$40 if postmarked by 6/30/24. Check payable to MMM, or PayPal to <mmmfclub@gmail.com>. If using PayPal we still need an entry form mailed or emailed. Past World Champions shall pay no entry fees. **Circle events entered.** Centennial & Columbine Cups (14-Rounder): F1A F1B F1C F1G F1H F1J F1P F1Q F1S F1ABC(L) Combo F1HGJ(L) Combo **AMA/SAM/NFFS:** HLG CLG Classic Towline P-30 OT Rubber Sm/Lg. Combo Andrade Rubber Nos. Rubber Sm./Lg. Combo Mulvihill/Moffett E-36 Electric A Electric B **Nostalgia Power:** 1/4A Early 1/2A 1/2A A B

Indoor Free Flight Model Airplane Flying

We are quite fortunate here in the Denver area to have an indoor flying site year round thanks to the generosity of the Beth Eden Baptist Church. Flying usually takes place once or twice a month throughout the year in the gymnasium of their on-site Baptist School. Flying sessions are on always on a Friday night, the doors open at 6PM. The flying is rather relaxed and low-key, with a bit of friendly competition thrown in for excitement. FUN FOR ALL AGES! Spectators are FREE, let's say that again, spectators can come and watch for FREE! If you would like to fly, we suggest a \$5 donation to the Church to be collected during the event. Flying usually winds down around 9PM, so a nice quiet evening of entertainment.

For info contact: John Christensen @ (303) 922-2355 or cloverdale1955@gmail.com

For info on Free Flight Planes: www.themmmclub.com or www.freeflight.org

LOCATION:
Beth Eden Baptist Church
2600 Wadsworth Blvd
Wheat Ridge, CO 80033

DIRECTIONS: Exit onto W 26th Ave from either N or S Wadsworth Blvd, the church entrance will be the first driveway on the N side of the street. The map below shows the route through the parking lot to the parking area in front of the Gym. Walk between the two buildings, a gray entry door will be on your left with a sign indicating "Airplane Event". Knock on the door and someone will be there to greet you!

Our 2024 Summer Schedule:** May 10th, June 7th and 21st, July 19th, August 2nd and possibly 23rd ****Confirm with John Christensen in case of changes**



5/11/2024 TN

IF YOU WANT TO BECOME A MEMBER, OR IF YOUR PERSONAL INFORMATION CHANGES, PLEASE USE THIS FORM

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DUES: Adult - **\$45.00**
16-20 years - \$10
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News Note: MMM Now accepts "PAYPAL" for Dues, Contest Entry Fees, Etc !!

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- *Click on "Send Money" in the upper menu bar*
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- *When pre-entering a contest that needs event selection or similar, you still need to send in the pre-registration form to the Contest Directors*

Note, Paypal does charge a fee for this service so if you do use paypal maybe add an extra buck to help us out