

# REPLICA

THE OFFICIAL PUBLICATION OF THE  
NATIONAL ASSOCIATION OF SCALE AEROMODELERS  
APRIL 2021



The National Association of Scale Aeromodelers (NASA) is an organization founded to promote all forms of scale aeromodeling competition, and is the host of the Academy of Model Aeronautics (AMA) Scale Nationals as the AMA Special Interest Group (SIG) for Scale Aeromodeling in the United States of America.

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Visit the NASA Website for more about the organization, scale competition, news, tips.  
[www.nasascale.org](http://www.nasascale.org)

## Hello NASA Members,

Well, all you masked men and ladies; it looks like we will return to somewhat normal sometime this summer. Some of you have already received the vaccine. We are an outside activity, and my feeling is that the threat is less.



Right or wrong if your field or club requires masks and distancing you should accommodate the request, all for safety. We are all ready and anxious to get back to the flying site. That brings me to this month's message, safety and personal check lists. Because of the winter break in flying, usually two or three months, we all should be vigilant and do an annual or safety check of our planes. Sometimes just a close visual inspection can detect a potential problem or failure in flight. Batteries and switches can be tested and cycled to check for maximum performance. Fuel tanks and tubing can be easily inspected by pressure testing or just a good old shake test of the clink. Engine maintenance; was it started after the last flight or does it need work now. Carburetor cleaning is easy as is a light oiling of the cylinder before flight. Control surface checks of the hinge system and glue areas are easily tested by a simply pull test. Air systems or electric gear should be operated a few times before your first flight. These are all easy actions that are in the interest of a safe flight. This week will I go out and start the Chief, jump in and fly, heck no. With a check list in hand, I will do a more thorough look after two months of it sitting in the hangar. Be safe out there.

NASA is welcoming new members every week, if you have a friend or flying buddy that enjoys scale airplanes and flying, please encourage him to join us. We support scale competition around the country. Yes, if your club decides to sponsor an AMA Scale Contest, NASA will support them with a \$250.00 grant and one hundred raffle tickets to sell and keep the proceeds. Of course, there are certain requirements, and these can be found on the [nasascale.org](http://nasascale.org) web site or in the application below.

*Mike's Article continued on page 8*

# 12" to the Foot

## By Stan Alexander

One of the bits I try and work on along with Dale Arvin and Joe Vermillion is keeping up with the NASA's facebook page. Anyone can join the facebook page and we look at it as a communication tool for scale modelers around the world who have the same passion for scale as we do. It was interesting to see how many facebook members we have around the world and while this isn't all of them by a long shot this is from where the most come. NASA continues to promote RC, CL and FF scale. It doesn't matter if you are only interested in building, judging, documentation, or checking out the full-scale aircraft from which the models are designed and constructed. Joining NASA is a great way to stay in contact with others who have the same passion as we do. Here are some of the countries listed below. Enjoy!

Country	Facebook Members
United States	3,257
Australia	298
UK	284
Canada	258
Brazil	197
South Africa	150
India	86
Spain	81
Italy	79
France	73

All told there are over 6,300 NASA facebook members around the world. We have simple rules of what we allow or don't allow. This should give you an idea.

This facebook page is for scale modelers for RC, CL and FF Scale modelers. We post contests, scale fly-ins, as well as hot tid-bits for building scale models from all over the world. We also post full scale aircraft photos as well as aviation museums photos for documentation. We encourage AMA/NASA contests to post announcements on this page. We also allow and encourage our NASA Sponsors to put up their adds on our facebook page. We also especially want to encourage new participation in scale contests and building of scale models.

If you do not answer the questions on your application, the application will be deleted. We do not allow: Political posts or comments, religious posts, non-scale airplanes or posts of any kind not related to scale model airplanes/jets. Ads from those who are not NASA Sponsors are not allowed. To become a NASA Sponsor contact the NASA President. If you do post an item we do not allow, it will be taken down and you will be deleted and blocked from the page. The fb page is a good spot to find updates on contests as well as other events taking place here in the USA as well as other countries.

Well 2020 was quite a ride for most of us. For those of us who are married and retired the isolation was one way to find out if you and your mate were truly made for each other. With all the COVID stuff on going, thank goodness we could still go to the flying field and socially distance . At this point I still have one more shot to receive.

We hope to see everyone at a contest, the Nationals, or the NASA Scale Classic sometime this year. While all the building we were able to do last year was great, a big part of scale modeling is definitely socializing and going to see who has come up with something new!

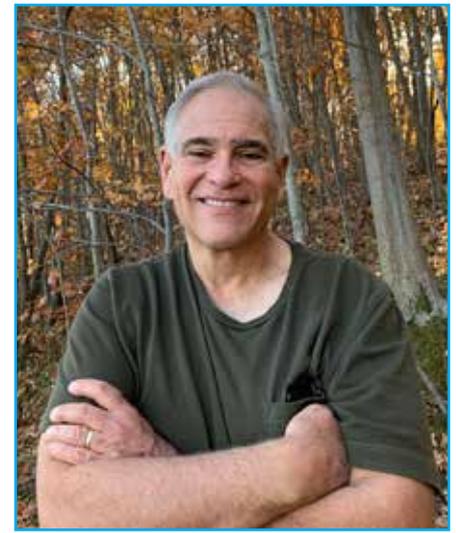
# Photos from the 2012 Scale Masters AMA Headquarters Muncie, Indiana



# A Plug for Scratch Building

By Gerry Garing

One of my favorite airplanes is the Mudry CAP 10. The CAP 10 is an aerobatic trainer with a semi-symmetrical airfoil and considered underpowered compared to current unlimited aerobatic planes. Its maneuvers are done through energy management and pilot finesse. The result is an airplane that is pleasing to the eye and graceful to watch. I decided the time was right to build my own CAP 10 at a size that captures the essence of the full-scale plane. The bigger the plane, the more realistic they fly, so I suppose a model at 100% would be the ultimate in realism. I compromised at 35% (111-inch wingspan).



The canopy, cowl, wheel pants, landing gear etc. are hurdles to scratch-built projects so I like to get them done early. As always, if what you need is commercially available, buy it because you won't be saving any money or time. The cowl, wheel pants, and gear fairings will be fiberglass. The canopy will be vacuum formed from PETG plastic. I'll state upfront that this not intended as a commercial operation. Many of you are more versed than I. Much of procedure flies in the face of best practice but keep in mind the goal is produce a few parts with minimal time and cost. The process begins by making accurate plugs from which female molds can be fabricated. The procedure goes like this. Foam is used to establish the basic shape. The foam is covered with body filler and polyester glazing putty to stabilize and refine the foam. The plug is used to lay up a female mold from which the final parts are made. The canopy requires an additional step which uses the female form to make a sturdy heat resistant plug capable of withstanding vacuum forming.

An accurate plug is a challenging piece of artwork. The rest is routine labor. I find it easy to get the basic shape but getting everything symmetrical is difficult. Using the canopy as an example, a frame or of formers will guide shaping of the foam. Either manually on paper or in CAD, draw one half of the shape and then use it as a pattern to draw the other half. Blocks of foam are inserted between the formers and shaped. Keep in mind that if you are shaping a curved section (likely on a canopy) transition between and not simply carve straight between the formers. The photo which looks like a 6<sup>th</sup> grade art project, shows the foam covered in newspaper and water-based polyurethane to protect the foam from the polyester filler. I found this isn't necessary as minimal foam actually dissolves during the few minutes until the filler hardens. It will take several applications and sanding of filler and subsequent applications won't attack the underlying foam.



**The canopy framework is built on a basic fuselage structure made from scrap wood.**



**Foam blocks are fitted within the framework. Precision is not critical at this point.**

Between coats of filler, vacuum the plug to remove dust and clean with wax and grease remover. This also helps to check for waviness which will show up in the reflection while the remover is wet. Nitrile gloves will magnify the sensation of waviness while wiping off the grease remover. Keep in mind that each batch of filler can differ in hardness depending on the filler to hardener ratio. This results in soft or hard spots which sand at different rates. The waves are straightened out with a skim coat of polyester glazing putty spread over the entire plug. The skim coat is then block sanded to a uniform surface. Sanding through to the underlying filler indicates the need to repeat the skim coat process. Once satisfied, the plug is ready to be primed, sanded, and prepped for paint.



The foam is shaped with a Surform file with 40 and 80 Grit sandpaper. It is a mess, Large voids are filled with Spackle



My 6th grade art project. The newspaper was to protect the foam from the Polyester, but proved not necessary.



Body filler is applied here and then sanded to shape.



A skim coat of polyester glazing putty is now applied.



The sanded and primed canopy. Certainly ready for that scale project.

I hope to entice Gerry to add to the article for the next issue of the Replica so we can see the end results.

I welcome these types of articles and believe they may spark someone to try the techniques they will need for that project.

As many know, a new project is generally not a kit and many parts need to be custom made. Gerry's article is one that may open doors as to how to make that scale cowling or canopy.



# NASA RAFFLE IS ALIVE & WELL!



That is certainly great news and some super sponsors stepped up and provided great items for the raffle with reduced pricing or purely donated. NASA could not do this without their generous support. Note, that this helps NASA fund the events such as the Scale NATS at the AMA Headquarters in Muncie, Indiana and support clubs that are hosting a scale event.

There is full page advertisement in this newsletter for the NASA raffle and you can purchase your tickets on the NASA Website.

Some lucky folks are going to win some really nice prizes and I know I would be glad to win any one of them as they all are that great.

Hey, I know the photo of me is not with a scale model, but of a full size C130 that I hope to build a flying large version of someday. The aircraft is based at Richmond Air Force Base in Australia and the photo was arranged by my buddy Pete Goff. What a thrill that day was.

Something you may not be aware of is that when you join NASA for you receive a page of discount coupons for many manufactures of scale products. That may very well prompt you to build that project you have been thinking about and still support NASA. If you haven't joined or renewed, I hope I can encourage you to do that today.

Next up is the Top Gun Invitational and my 33rd year announcing it. I usually see a lot of NASA members there with many entered in the competition. If you attend the event, be sure to stop by my tower and say hello. You will be able to by your raffle tickets at Top Gun.

The COVID stuff has really dampened our events on the West Coast and several are attempting to hold their dates in Northern California in late May. I am hoping they hold as we have an RV full of fuel and chomping to go to an event with a trailer full of airplanes. I am sure many of you are in the same frame of mind. I enjoyed the time in the shop when we didn't have to go to the office, but also I was ready to get out at the same time and see friends, fellow pilots and knock the rust off the sticks.

Until next month stay healthy and get some stick time in!

**Sam**

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## On the Control Line Side.



Here it is March and time to get our planes off the garage wall and get them ready for the 2021 flying season. At least here in the mid-west that is what we need to be about.

Keeping in mind the present climate in the U.S. with the Covid-19, this schedule may or may not be correct. Control line scale contests start in Eugene, OR (actually it's been moved back to Sept.. The Brodak fly-in in the middle of J une has been canceled and may never return. We have been to the Brodak fly-in many times and I can tell you next to the Nats this was the best CL scale contest of the year. Then there is the Nats June 17 – 19, Thur.- Sat. in Muncie, ST Louis, MO. and ending the year with the NASA Scale Classic inMuncie at the AMA in Sept.,17-19 Fri.-Sun. There may be more

events added as the year goes on but this is what we have now.

While attending fly-ins and contest around the country, I've had time to sit and talk with people about competition flying. It has afforded a time to talk about what NASA is all about. True, NASA is about promoting scale competition with-in CL, FF, RC and helicopter scale. But let me say this, it's more fun than just putting one in the air then calling it a day.

I started flying scale competition about 18 years ago and it has intensified my enjoyment of this hobby. The people and fun we have with one another at these events is what modeling is all about. It is also a great way to learn new skills about your building and flying. There is always someone around happy to lend a helping hand.

I've been asked, "Isn't it an expensive hobby". Not really, if you were into bass fishing you would have a \$40,000 bass boat, \$65,000 truck and Lord knows how many \$\$\$\$ in equipment. Then there is the game of golf a cart \$\$\$\$ and a nice car and trailer \$\$\$\$ clubs \$\$\$\$ and special colored clothing and shoes \$\$\$. The point is it cost something to do what we enjoy. As an official of FCM (Fellowship of Christian Modelers) we encourage everyone to keep it (whatever we do as a hobby) within bounders, hobbies are a thing to enjoy, not take over your life.

Going into this season we are praying for great weather and many successful flights. Hope to see you in the circle somewhere this summer.

Blessings

**Allen Goff**



**BRODAK 2014 Event**



**BRODAK 2014 NASA Scale Classic**

# More Control Line Great Memories



**BRODAK 2014**



**BRODAK 2014**

*Mike Barbee's President Article continued from front page*

DON'T forget the NASA 2021 RAFFLE four great prizes donated by our friends at Desert Aircraft, Electro Dynamics, National Balsa, Legend Hobbies, and JR radio. Thanks to them for stepping up again this year. John and Carl are putting together plans for the Nats to be held in Muncie at the AMA site 4. Come out and fly with us Wednesday June 16th thru Saturday June 19th. I'm taking care of the pizza Thursday night and our banquet will be Friday night.

Renew your membership now, thanks.

**Mike Barbee**

*Stan's Article continued from page 2*

B&B Specialties- It would appear that Horizon has stopped carrying the Zenoah line of engines. While they are as some would say old school and heavy, I've never seen a scale model that didn't need a little nose weight. B&B is carrying the Zenoah line of engines including the G-26 and on up the line. Some of these are fitted with on-board starters as well.

One of the things WWI modelers like is the engines size is physically shorter than some of the other brands of engine which makes a better install in the short cowls. So check them out.

Below are fond memories of events past:

Cheers!

**2021 Control Line Scale**



**2018 NASA Scale Classic**



**2019 Scale NATS**





## Application for Scale Contest NASA Sponsorship

NASA will provide \$250.00 and 100 raffle tickets to each AMA sanctioned club that hosts an all scale AMA sanctioned contest providing the following stipulations are met.

- This application must be completed and returned to the NASA Contest Coordinator.
- AMA rules for scale competition and scoring must be followed.
- The contest must include all AMA Scale RC and/or Control Line Scale events.
- The contest must span at least two consecutive days.
- The application must be received two months in advance of the contest date.
- An electronic copy of the contest flyer must be provided with the application.
- NASA Score sheets must be used during the event. ([www.nasascale.org](http://www.nasascale.org)).
- The contest results must be submitted to the NASA CC with 30 days of the contest.

Upon NASA review of this application the Contest Director will be notified regarding approval by the NASA CC. Contests previously sponsored will have priority. Applicants will be notified of conflicting dates and allowed to resubmit. Once the annual sponsorship budget limit has been reached NASA will not accept new applications for the current year, however applications can be submitted for subsequent years.

Name of the Contest \_\_\_\_\_

Name of the Club \_\_\_\_\_

Name of the CD \_\_\_\_\_ AMA # \_\_\_\_\_

Name of contact \_\_\_\_\_

Contact Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Email \_\_\_\_\_

Telephone \_\_\_\_\_ Cell Phone \_\_\_\_\_

Date of the Contest \_\_\_\_\_ AMA Sanction # \_\_\_\_\_

Contest Location \_\_\_\_\_

Return this application to the NASA S/T at [jeffreykeithpike@hotmail.com](mailto:jeffreykeithpike@hotmail.com)

Return your contest results to the NASA S/T listed above.

Upon completion of all the above stipulations NASA will submit a check to the host club via the contact.

**The check must be payable to the order of the Official Club Name (no individuals allowed).**

*Revised November 20, 2020*

# 9th Annual Columbus Scale Classic

August 15th & 16th 2021

AMA Sanction AA # 10166

CD Mike Barbee

mabarbee@aol.com



## Scale Classes

511 RC Sportsman Sport Scale

512 RC Expert Sport Scale

515 RC Designer Scale

522 RC Team Scale

521 Open Class

Beginner, Beginner Class Scale

~ **Pre-Registration is ENCOURAGED E-mail Please** ~

**WMAA Flying site Dinneen Field**

**Alum Creek State Park**

**Flying Starts 10 am Saturday, 8 am Sunday**

**Static Judging 8 am Saturday**

**See the best scale models in the area**

**Please make a reservation for the party so we can maintain requirements for Covid-19. Pilot and Guest Hangar party**

**Saturday Evening at the Monster Hangar**

# US Scale World Championships

It is safe to say that the majority of us at one time or another in our lives have watched the Olympics. How many of us have wondered what it would be like to participate in the Olympics? To represent the US on the world stage? I know I have. I'm willing to say many of us have wondered the same. The majority of us were never athletically gifted enough to become an Olympic athlete. Did you know there is a World Championship competition flying scale airplanes That you could represent the US on a world stage flying scale models

The Fédération Aéronautique Internationale (FAI) World Air Sports Federation is the international body organizing flying competitions for both full scale and model aircraft. The AMA along with the respective SIG s have sent teams to the World Championships in several different disciplines. There has not been a US scale team for several years. I am excited to announce that NASA and the AMA are planning to select an US scale championship team for the 2024 World Scale Championships!!



Within the FAI Scale rules there are several different classes. Control line is the F4B class. RC scale has both F4C and F4H. At the last World Championships, there was not an F4B event held. However, there is an effort to have F4B offered at the 2024 World Championships. NASA s Goal is to fill an F4H team, with enough interest and contestants, an F4C team as well. F4H and F4C use the same flight maneuvers and judging criteria for flight. The difference between F4C and F4H is in the static scoring portion of the competition. F4C has been the long-standing R/C scale class at the Scale World Championships. It is very similar to our AMA designer scale class where you begin by drawing your own plans. With an F4C, not only do you have to be the designer, but have the skills and capability of producing the vast majority of the components for the model in order to be competitive. F4H was developed as a sports scale class within FAI. The static rules are very similar to our AMA Expert Scale class. Since the introduction of F4H in 2014 it has rapidly become a popular class at the World Championships. An F4H airplane is any plans or kit built model which an individual has built, and is limited to 33 pounds. Looking at past FAI winners, any well-built and documented airplane is competitive. In 2016 the F4H winner was a P-47 built from a modified Top Flight P-47 kit. The builder took the kit and made the necessary changes to the model to match the photographs and three views. It places competing at the World Championships with reach for many of us. Sounds pretty exciting!!

The plan is for us to begin offering F4H and F4C at the Scale Nationals in Muncie this summer. This will enable us to work out logistics and planning to ultimately hold FAI team trials in 2023 for the 2024 Scale World Championships as part of the Scale Nationals. We also encourage local contests to look at offering FAI classes so we all can become more familiar with the rules and nuances. We have put together a packet of information outlining what is needed to compete in F4H. Contact Jack Buckley at [jcbuck@verizon.net](mailto:jcbuck@verizon.net) or myself John Boyko at [jboykot28b@gmail.com](mailto:jboykot28b@gmail.com). We are happy to send out the packet and answer whatever questions you may have.

**John Boyko**

2021 R/C Scale Nationals Co CD

## 2021 Control Line Scale Photos





www.nasascale.org



# FIRST PRIZE

TOP RC CORSAIR

JR PROPO RADIO SYSTEM

DA 70

A123 BATTERIES & SWITCHES

Warbird Pilots

# SECOND PRIZE

PT-17 SHORT KIT

87" NICK ZIROLI PLANS

NATIONAL Balsa - SHORT KIT

PHOTOPACK DOCUMENTATION



# THIRD PRIZE

DA 85



# FOURTH PRIZE



LEGEND HOBBY MORAINE SAULNIER



Tickets:

1-\$5 3-\$10 7-\$20 20-\$50



DRAWING TO BE HELD AT THE NASA SCALE CLASSIC ON SEPT 18, 2021

## ***NASA is all about scale competition.***

We are constantly looking for ways to increase the participation in scale contests. Occasionally I run into contestants that used to come to the Mint Julep which I have run for 49 years and the NATS that I ran for many years and I ask why they do not still compete. The answer is often, "The same 4-5 guys win every year so why bother".

If you look at the results of many of the larger scale contests you will see that the winning aircraft are generally jets and large military aircraft. To me, it seems that scale contests have become aerobatic contests. I have no issue with jets or large military aircraft. If I could afford one I would be right there. The issue is with the judging.

I have been running scale contest for almost 50 years and it seems that no matter how much I preach that a light wing loaded, fabric covered aircraft with a slight bobble in a fly pass is just as scale like as a jet with a pass that does not bobble. They are both flying scale like and should receive like scores. My efforts have fallen on deaf ears. Currently we have a few scale rules proposals that may help in this regard.

Proposal RCFWS21-01 is for making many changes in the wording of the rules to make them clearer. In the new descriptions it outlines that light wing loaded aircraft should not be downgraded for wing bobbles in windy conditions. If judges read this, and follow it, there may be some improvement.

Proposal RCFWS21-08 submitted by Mark Radcliff proposes to divide the classes into two divisions by type of aircraft. This separates the classes into heavy metal and fabric covered aircraft. So, jets and heavy metal military aircraft do not compete with Piper Cubs, Waco's, Etc. I started doing this at the Mint Julep over twenty years ago. It works well, as the jet and heavy metal guys are generally the Pros and the Cub and Waco guys are generally not so much. Maybe, so as not to make the jet and heavy metal guys think we are discriminating against them we create a new PRO class. In this class every one that has placed 5<sup>th</sup> or higher in a scale contest must move up into the pro class. This will let the pros compete against themselves and let the rest of us have a chance at a trophy. This may bring some of the "...why bother guys" back into competition.

Keeping with the theme of getting more modelers involved in competition maybe we should consider the cost involved with getting started. Not everyone is sponsored or can afford a \$4,000, \$5,000 or a \$10,000 plane. When you look at the modeling magazines you see more and more about park fliers, mostly foamies. I have a few myself. A lot of these are scale planes. Why not get these guys involved?

At the 2019 Mint Julep I held an all-electric foamy class. I understand our friends from the Dallas, TX. area have been doing this for several years. In order to include those planes that do not have long flight times I limited the flights to 5 maneuvers:

Take off  
Fly pass (any speed)  
Two options (one can be a mechanical operation)  
Realism  
Landing

No static score but planes must be a model of a full-scale plane. We only flew two rounds and averaged both for the final score. This event was a big hit and we had about 10 entries. This may be a way to get some of the park flyers involved in competition. After all, competition is competition.

Dale Arvin

## *More Memories from the 2019 Scale Nationals*



The Central Ohio Radio Kontrol Society (CORKS),  
in association with the National Association of Scale Aeromodelers (NASA),  
present to you the third annual...

# CENTRAL OHIO SCALE MEMORIAL

August 28<sup>th</sup> and 29<sup>th</sup>, 2021

Chapman Memorial Field - 3183 Columbus Rd, Centerburg, OH 43011

*Back for our third year, this time re-branded as the Central Ohio Scale Memorial. While we focus on the amazing scale RC aircraft and those who pilot them, we also remember and pay tribute to those who have paved the way in the hobby and passed on before us. We also plan to donate a portion of proceeds to charity. Come out, enjoy the outdoors in a family friendly environment, and witness some of the most talented RC pilots in the area. Be sure to bring a lawn chair because we're sure you will want to stay a while!*

## Spectators...

- Free parking!
- Free admission!
- On site concession stand with reasonable prices!
- **Free tailgate swap shop with vendors booths!**

## Pilots...

- Full Scale grass runway
- **Friday practice flying**
- First aircraft entry \$20, second entry is \$10!
  - o *Pre-registration encouraged*
  - o **Free pilot prizes**
- Prizes through 3<sup>rd</sup> place in each class
- On site camping (no hookups, limited space available)
- Classes include:
  - o 511 – RC Sportsman Scale
  - o 512 – RC Expert Sport Scale
  - o 515 – RC Designer Scale
  - o 520 – RC Fun Scale (Novice and Open)
  - o 522 – RC Team Scale
  - o 523 – Open Scale



Static judging at 8a Saturday. Flying begins at 10a Saturday and Sunday.

For more information or to pre-register, please contact:

**CORKS CD - Keith Bryant**  
**acsd2703@yahoo.com**  
**(740) 404-5354**

**OR**

**FORKS CD - Adam Grubb**  
**grubb.34@osu.edu**  
**(614) 312-4290**

# What Does NASA Do for You?

by Jeffrey Pike

Following is the mission statement from the NASA by-laws:

*To encourage, promote and advance all phases of scale aeromodelling, regardless of size, power or mode of control. To encourage the formation of scale clubs. To encourage flying scale competition at all levels. To encourage the training of scale judges for competition. To encourage the sharing of scale data, photos and drawings. To maintain good relations with media and Academy of Model Aeronautics to further enhance the image of scale aeromodelling. To produce a newsletter for scale aeromodellers.*

As members of NASA it is our duty to ensure that our resources are used for the purpose described in our mission statement. I have heard it asked, "What does NASA do for its members?" and my response is simple, "NASA members do for NASA the work to carry out our mission. "to promote scale aeromodelling competition of all types at all levels."

All members provide financial assistance through donations of various types which does include membership dues. Those that pay dues are granted the opportunity to provide input to the organization by voting for elected officers and voting on by-laws changes as they are brought forward. Other members that contribute financially, but do not pay dues, do not vote but are given access to member only resources and also a subscription to the Replica as are voting members.

Some of our members step up in other ways, such as promoting/planning contests, being Contest Directors, judges, providing services and or working at contests. The voting members elect a number of officers (usually three) every other year to serve a two-year term leading NASA on its mission. These elected officers are the Board of Directors and they each year select a group from the membership to act alongside the BOD as Executive Committee Members to help the BOD plan and carry out the activities that serve the mission.

NASA cannot carry out the mission without its members support both financially and hard work. Please help us continue the mission by renewing your membership, encourage others to join, providing insight, helping to build our contest calendar, working at contests and providing other support through the raffle and supporting our sponsors. Go to [nasascale.org](http://nasascale.org).

Have a good 2021 and I hope to see you on the flight line.

Jeffrey Pike  
S/T NASA