FLIGHTLINE

NEWSLETTER OF THE PALM BEACH RADIO CONTROL ASSOCIATION

Schroeder S1 Cyclogyro

[Cycloidal Rotor Airplane: The Cycloplane]

AMA Club# 1016

ONE OF THE LARGEST AMA CLUBS IN AMERICA

Winter 2024

The Palm Beach Radio Control Association
Current Board of Volunteers

John Scaduto	President/Webmaster/Newsletter Editor
Gary Hoffman	Vice President
Princeton Rose	Treasurer
David Spielman	Secretary and Membership Chair
Vacant	Chief Safety Officer
Jon Gerber	Chief Training Officer
Seth Sterling	Director

Please use the following email address to contact any of the Directors:
pbrca.info@gmail.com

Membership Meeting Dates!
Second Saturday of Every Month
ALL DATES ARE TENTATIVE

January	11th, 2025	10:00 AM at Westervelt Field
February	8th, 2025	10:00 AM at Westervelt Field
March	8th, 2025	10:00 AM at Westervelt Field
April	12th, 2025	10:00 AM at Westervelt Field
May	10th, 2025	10:00 AM at Westervelt Field
June	14th, 2025	10:00 AM at Westervelt Field
July	None	Summer break
August	None	Summer break
September	13th, 2025	10:00 AM at Westervelt Field
October	11th, 2025	10:00 AM at Westervelt Field
November	8th, 2025	10:00 AM at Westervelt Field
December	13th, 2025	10:00 AM at Westervelt Field

For more information and upcoming events please visit the Calendar page of the PBRCA Website

https://www.palmbeachrc.com/calendar

A FRIA approved club (FAA-Recognized Identification Area)

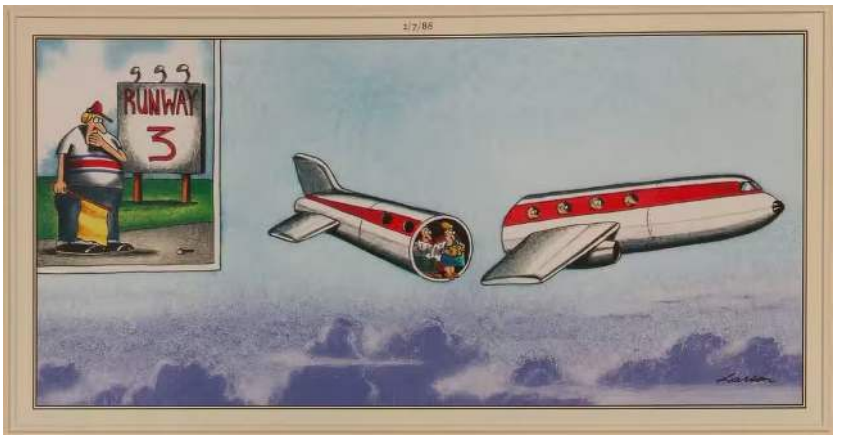
John Scaduto
President/Webmaster/Newsletter Editor

As we close out 2024, I want to take a moment to reflect on what an incredible year it has been for our club. From the first takeoff of the season to the final landing, we've shared countless moments of camaraderie, heartache for those who experienced loss of a model, skill-building, and sheer passion in the air. None of this would have been possible without the dedication and excitement of our membership. Whether you're a seasoned flyer or new to the hobby, each of you contributes to the vibrant community that makes our club special.

A heartfelt thank you goes out to everyone who volunteered their time and energy this year. Whether you helped organize events, maintain our field, or stepped up in countless behind-the-scenes ways, your efforts have been instrumental to our success. There are too many of you to name individually but know that your contributions have not gone unnoticed. Special recognition must also go to the many events we've hosted this year—fun flies, competitions, and community outreach events—all of which showcased the best of what we have to offer.

This year also saw the debut of several exciting new events, including 3D Over the Glades, Pylons Over the Glades and Helis Over the Glades. These inaugural events brought fresh energy and new challenges to our schedule, and their success is a testament to the creativity and dedication of our members. We hope to continue building on these events in the coming years, and we welcome your ideas and participation to make them even better in 2025.

I'd also like to remind everyone to stay connected! Be sure to visit our website and follow us on our Facebook page for the latest updates, event announcements, and club news. These platforms are a great way to stay informed and engaged with the club, so don't miss out. Looking ahead to 2025, I hope you'll continue to bring that same enthusiasm and generosity. Our events rely on volunteers, and I encourage everyone to consider lending a hand in the coming year. Whether it's big or small, every effort makes a difference. Together, we can keep our club soaring to new heights.



Don't forget about that last screw!!

Here's to blue skies and smooth landings in the new year!

John Scaduto

A note from the PBRCA Board of Directors

The PBRCA BOD would like to take a moment to shine a spotlight on one of our great members, Arty Mundell, whose contributions to our club have been noteworthy.

Arty has been a steadfast supporter of our club for many years, generously giving his time, talents, and creativity. Here are just some of the many ways he has contributed to our success and community:

- Served as Vice President during several board terms providing valuable leadership and insight.
- Represented our club at the South Florida Fair by volunteering at the Hobby Booth for many years.
- Acted as a Leader Member and Intro Pilot, helping to guide and mentor new members.
- Captured the spirit of our club as the official (and unofficial) club photographer, documenting our events and activities for the website.
- Taken, printed, and distributed pilot pictures in branded club folders to event contestants as a personal donation to the club.
- Since early this year, young and old distributed 3D-printed airplanes and gadgets to spectators, spreading enthusiasm for our hobby and sharing these moments on our website.
- Created and printed various stationery and event cards for the club.
- Designed and produced vinyl signs for our fields, enhancing their professional appearance.
- Volunteered at nearly all of our events, demonstrating an unwavering commitment despite recently needing to slow down.

Arty's dedication and generosity have left a lasting impact on our club, and his efforts have enriched our organization in countless ways.

Please join me in extending a heartfelt thank you to Arty for all that he has done. We are fortunate to have such a passionate and talented member in our midst.

Arty, on behalf of the 2024 BOD, thank you for your tireless work and for the joy you bring to our club. Your contributions are deeply appreciated, and we are grateful for all that you do!

Gary Hoffman

Vice President

Choosing the Right Glue by AMA -adapted by Gary Hoffman

Written by Terry Dunn - A builder's guide to common adhesives How-to As seen in the October 2013 issue of Model Aviation.

There's a television commercial that reminds us to shop around for car insurance every six months, lest we miss out on a better deal. Maybe we should apply similar logic toward the glues we use. If you haven't scanned your hobby shop's glue shelf in a while, you may be unaware of some contemporary offerings.

As new materials have been ushered into the modeling realm, so have new adhesives. Likewise, new modelers are often unfamiliar with some of the classic hobby glues that have stuck around.

This article is not intended to be a comprehensive catalog of modeling glues but is meant to serve as a broad overview of what's available. This article also avoids the technical aspects of how and why glues work and behave the way they do. Chemistry never was my best subject, so I'll stick to the basic properties and practical applications for each of the listed glues.

In no particular order, the glues I've chosen to discuss are:

• Cyanoacrylate (CA): This is the most popular type of glue in all modeling. I'm comfortable making that assumption. Thick, thin, foam-safe—at least one type can be found on nearly every modeler's workbench. Yet, CA is also one of the most hazardous glues on the list. Who among us has not glued his or her fingers together, ruined a pair of jeans, or cried from the fumes? Most of us are willing to accept and manage that risk for the reward of strong and immediate glue joints.

• Polyvinyl acetate (PVA): Most of us have been using (and perhaps eating) PVA glue since grammar school. Whether you call it Elmer's Glue or white glue, you already know that it is ideal for attaching raw macaroni to construction paper. It is also useful for gluing balsa airframes together. Yellow Carpenter's Glue is also a PVA glue. It tends to be tackier than white glue when wet, which is often useful.

• Canopy glue: Although canopy glue looks similar to common white glue, it performs differently. Canopy glue bonds well to nonporous materials and remains flexible when dry. These properties are what make canopy glue well suited for attaching plastic parts (such as a canopy) to the skin of a finished model.

• Goop: This household glue has a strong odor until it dries into a rubbery consistency. It sticks to nearly anything, but it will dissolve some foams (always test first). It works great on vibration-prone joints.

• Cellulose glue: Modelers have been using cellulose glues such as Ambroid for decades. It is still a favorite adhesive for weight-conscious and/or nostalgic builders. Cellulose glues can be thinned with acetone to the desired consistency and applied with a syringe for extra precision. When dried, the glue is lightweight and easily sands.

• Contact cement: There are many types of contact cement, but they work in the same basic way. Glue is separately applied to each of the mating parts and allowed to dry, then the parts are combined for a quick bond. This is a popular adhesive for sheeting foam wings and building foamies.

• Epoxy: A longtime favorite for high-stress joints, two-part epoxy is hard to beat when strength is the main objective. It requires careful mixing to ensure proper curing and deliberate application to avoid excess weight. Epoxy is available in versions with various working times (5-minute, 30-minute, 1-hour, etc.). There is an art to dispensing each part in equal amounts and also sizing the batch to have the right amount of epoxy for the job.

• Hot glue: Hot glue is applied using a gun-like, heated applicator. The low-temperature versions of hot glue can be applied directly to sheet foam without melting it. The quick drying (cooling) time of hot glue makes it ideal for assembly of flat foam models. Keep in mind that hot glue joints can get brittle in freezing weather. Hot glue is handy for quickly assembling sheet-foam models. This fancy glue gun has a variety of applicator tips. Even inexpensive glue guns are effective.

• Polyurethane glue: This glue expands as it dries, making it ideal for repairing crashed models. Bond strength can be improved by poking holes in the mating surfaces. It can also be used for initial builds. Water (including humidity) is the catalyst that kicks off the curing process. Care must be taken to keep the bottle airtight between each use to prevent curing. Polyurethane glues expand as they dry and fill gaps. This is useful when repairing damaged models.

• Water-based polyurethane: This easily applied, brush-on liquid can be found in the household paint section at your local hardware store. It provides a lightweight method for adhering fiberglass cloth to balsa or foam models, although it does not provide the same degree of structural rigidity of an epoxy-based finish. It can also be used to laminate foam sheets together.

You may have a favorite glue or two that isn't on this list. Be sure to share that secret adhesive with your flying buddies.

More importantly, watch for new glues. It appears that there is always something new, and this week's release might be what you've been looking for!

—Terry Dunn terrydunn74@gmail.com

Princeton Rose
Treasurer

Reflections and looking ahead…….

Wow, another year in the rear-view mirror! And, we continue having fun in our hobby. Reflecting on 2024, I am happy to report that we carried out our goal of replenishing our coffers following the large and needed investments made in 2023. During 2024 we hosted several successful fund-raising events that provided funds for our coffers and allowed us to continue supporting a veteran's organization and spreading joy to several kids at Christmas. Our R/C flying sites and club operations benefitted from club funding for new signs and security fencing and tree trimming at the heli field. As we discussed at our December 2024 General Meeting, "living within our means is paramount" which requires covering operating costs with our primary funding source, membership dues, and we are continuing to do so.

We continue working with the parks department on a solution for the water pooling by the carports on the West runway and are confident that a solution will be implemented in the near term. We can now focus on our evolving 2025 schedule of events which includes our second annual "3D" event in February and another heli event in April. In addition to providing thrilling and fun experiences for club members and visitors, we expect a positive monetary impact from these events.

Charitable giving from club activities in 2024 consisted of cash donations to Alexander Nininger Veterans' Nursing Home and Toys for Tots. We also donated several bags of toys to Toys for Tots. Our participation in the 2024 South Florida National Model Aviation Day fun fly event enabled participating clubs[1] to make another generous contribution to Feeding South Florida. This was our third donation in as many years to Feeding South Florida and we are still impressed with their operation.

Remaining improvement projects include refurbishing our Press Box floor and walls and as already mentioned, installing a solution to manage water pooling from heavy rains under the runway carports. Longer term we must resurface our 18-year-old runway. ***It goes without saying that responsibly maintaining our wonderful flying sites requires the commitment of our members and their financial support.***

Princeton - December 2024

[1] Participating clubs were Opa Locka Flying Tigers, Aero Modelers of Perrine, and PBRCA.

David Spielman

Secretary and Membership Chair

Membership Report Winter 2024/2025

Our membership is in pretty good shape with about 240 current paid members and another 50 on our roster trying to decide if they want to renew. Your membership goes a long way to making the PBRCA fields a great place to fly. It helps pay for facility improvements. We've been working on improving your walk to the runway from the car ports. If all goes as planned, you'll have a dry walk from the 4 carports to the runways before the beginning of the wet season. Quotes are coming in and site plans are being reviewed by the Parks department.

I'm chugging along with processing club memberships, finally cleaning up my backlog. That's good news for all of you reading this, cards are on the way. After setting up 30 renewals and adding 2 new members, I felt it was time to send out a reminder to 66 members who were about to have membership expire on December 31st. Holy crap, that's a lot of work to do. Good move because the months are half over.

We have about 295 members on our 2024 roster, and we as a club need your help to keep that number up with your renewal. The PBRCA memberships follow your AMA membership schedule. When the AMA sends your reminder to renew, that's your que to renew PBRCA membership too.

What makes memberships take more time to process. Well most of the time everything's right on, but sometimes your AMA membership expires before your paid up PBRCA membership will. If you get a message from me asking to renew your AMA to get more time out of your PBRCA payment, it's to help you stretch your dollar.

Here's a question that keeps coming up. Why does the FAA drone rules apply to me since I fly planes and not drones? Congress directed the FAA to classify everything radio controlled that's greater than 249 grams that flies as a drone. Kind of crazy, but that means planes that we've flown safely since the 1950s, are now under FAA control. Good thing we have a FRIA at our three club flying fields! FAA allows us to fly like we used to at our site. Love it! No drone tracker hardware or software required. We do need all planes, helicopters, and quadcopters over 500grams to have an FAA number on it though. One little FAA number for all your stuff that flies is all that's needed. Also, keep in mind that drones-the quad copter type-are not permitted on the fixed wing field with the exception of search and rescue.

So, keep your PBRCA membership up to date. If you lose your card, I'll send you a new one and if you can't remember if you're current, ask me or a board member. Your membership counts!

Fly Safe,
David Spielman
Membership Secretary

Vacant
Chief Safety Officer

This note serves as a reminder of the importance of securing personal belongings, prompted by an unfortunate incident involving one of our members. Recently, a member's wallet was stolen from their car while parked at the field. Sadly, this may not be the first such occurrence, as a similar incident was reported during a past event.

These incidents highlight the need to remain cautious, even in places that feel safe. To help prevent similar occurrences, members are encouraged to follow these simple precautions:

1. **Lock your vehicles at all times:** Even when stepping away for a short period.

2. **Keep valuables out of sight:** Store items in the trunk or another concealed location if they must be left in the car.

3. **Stay alert:** Report any suspicious activity to the police as soon as possible.

The field is a cherished space for all members to enjoy, and taking these proactive steps will help ensure it remains a safe and secure environment for everyone.

Thank you for your cooperation and attention to this matter.

Jon Gerber
Chief Training Officer

Seth Sterling
Director

Gyros!!
Two problems, one solution.

Problem #1:
When setting up a new gyro in an airplane, it's vital to make sure that the gyro is moving the ailerons or elevators or rudder in the correct direction to maintain level flight. Too often these control surface movements can be difficult to see clearly since they move quickly and may not move very much.

Solution #1:
Temporarily attach the "clothespin control surface extender" to each elevator, aileron, or rudder.

Problem#2:
When doing a ground range check, it may be difficult to see your rudder or elevator responding to your transmitter sticks from a distance.

Solution #2:
See solution #1.

Seth Sterling

FEATURE ARTICLES

What is a Drone?

By David Spielman

How confusing. Ever since those multi-rotor aircraft came along, we had to define what we call our aircraft. Well, per the FAA, all remote-control model aircraft are drones. That doesn't make it easy. Most of us call the multi-rotor aircraft drones and airplanes, helicopters, jets, and tilt wing VTOL aircraft by their description. So now we know that everything RC is a drone, sheesh!

So, what types of multi-rotor drones are there?

This is where it gets really confusing. There are subsets of multi-rotor drones: race drones, freestyle drones, cinema drones, standard drones, and whoop drones not to mention toy drones. DJI makes the most popular standard drone and many cinema drones. This product line comes with geofencing and complies with full factory remote ID. The DJI drones are so sophisticated the geofencing won't let you take off if you are close to a restricted area like a stadium or airport. DJI even includes a Mavic mini that is under 249 grams, so it avoids FAA restrictions.

DJI Mavic

Cinema drones have subtle differences from standard drones. Cinema drones are usually larger and tuned for cinema level photography and often flown with first person video (FPV) goggles. They tend to be faster and can handle higher winds to do things like a highspeed chase. Performance and flight time varies. This lineup has more sensors to protect the drone, meaning you don't crash as much. After all, no one wants to crash a multi-thousand-dollar drone.

Freestyle Drone & Digital FPV Goggles

Freestyle drone: This is a class of multi-rotor we commonly call quadcopter, which is used for stunt flying. It's flown FPV, first person video, like you are in it, by using a drone mounted camera and video transmitted to goggles you wear. These quad copters are usually built on an extremely strong frame to withstand crashes and range in size from a 2.5" to 7" span. The sweet point for now seems to be 5". Expect flight times from 3 to 5 minutes depending on how hard you fly. You need an FCC license in addition to all the other memberships to fly an FPV drone because you are broadcasting video on the 5.8ghz Ham band. Speed is typically 55 to 75 mph.

Race Drones

Whoop Drones & FPV Goggles

Whoop Drones are small and are flown indoors, but some can be flown outside. They are flown while wearing FPV goggles like freestyle and race drones. Don't underestimate the performance of these drones. They fly fast and are very maneuverable. There are competitions with whoop drones with courses set up indoors. Their weight is under the 250-gram restriction, so there are no FAA restrictions on these.

Multi-GP racecourse and Race Drone & Analogue Goggles

Florida has a big resource for the multi-rotor industry with a number of in-state suppliers.

Resources:

Get FPV
https://www.getfpv.com

Race Day Quads
https://www.racedayquads.com

Ready Made RC
https://www.readymaderc.com

Rotor Riot
https://rotorriot.com

New Bee Drone
https://newbeedrone.com

Web photos from these suppliers are used in this article. Drone racetrack photo by Adam Smith.

David Spielman
PBRCA Secretary

HELP!

David! I'll pay you to get my husband's planes out of the bedrooms, the kitchen and office and figure out how to hang them in the garage. Game-on! This is a good challenge. I know that the commercial plane hanging systems are expensive, topping $70 per plane. They also look a little complex to retrieve planes in them. I want something easy to use and budget friendly. The planes aren't that big, weighing in at between 3 and 8 pounds. Ok, I've got some specs to work with.

Off to Google! Pinterest pops up with photos of plane storage systems. Looking good at first sight. All the designs seem to be coming from RCU (RC Universe) Some seem good. PVC seems to be a material of choice. You have your basic rectangles that hang from the ceiling. There were also planes hanging from ropes with pully systems and cleats to tie off the lines. A very popular system are stands made of PVC pipe with 2-foot protruding supports for wings.

We kind of like this design where planes hang from hinged PVC pipe.

Way too complex of a design. It holds a lot, but way too difficult to work with.

Time to whittle down the designs. Out are wall hangers and free-standing contraptions. The garage is small, and two cars are in there. Plus, there's no wall space, so a ceiling system is needed. The garage ceiling is 10 feet tall, and I want to use a 3-1/2-foot kitchen step ladder so it's safe to retrieve the plane. The plane is going to need to hang about 18" from the ceiling. This way if upright the rudder will clear obstructions and if upside down the plane won't be damaged carrying things past them.

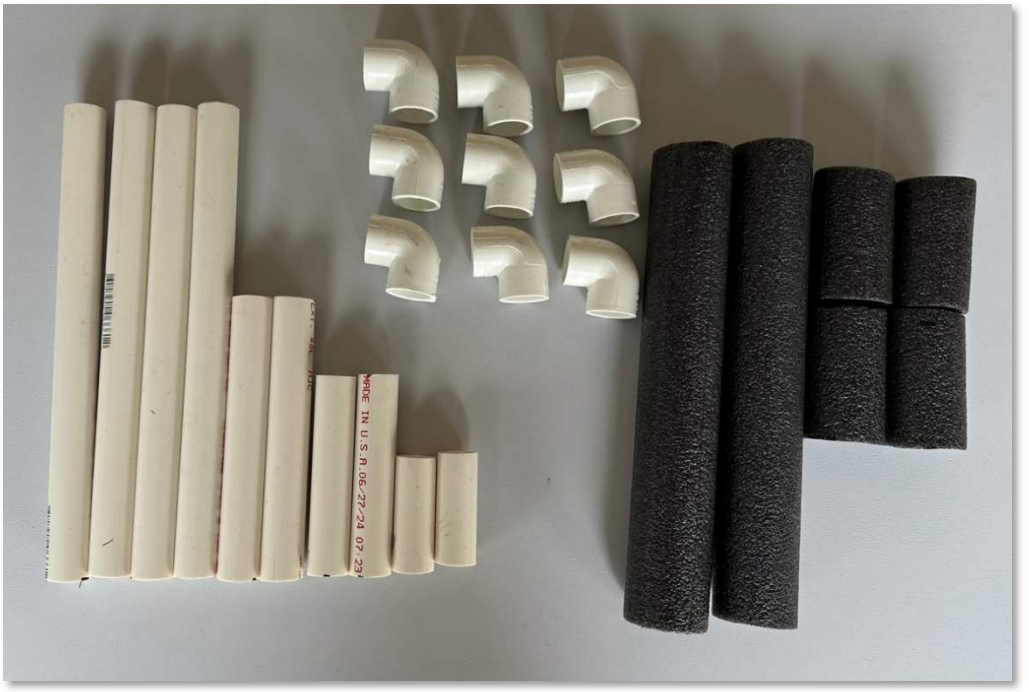
Next step, let's play building blocks like Lego or Lincoln Logs, take your pick. I have a supply of schedule 40, ¾" PVC pipe and fittings to work with. Out to the Hot, Hot garage I go to make a mess and spread out. While working with the design, friction fit is all that's needed for this first step. Glue will stifle creativity because you will literally be "stuck" with the design.

What to hang? 1. An Eflite Viper 90mm EDF, weight 8 pounds. 2. An Eflite 1.2-meter T28, weight 6 pounds. 3. An Eflite Timber X, weight 4 pounds. 4. An Eflite Cherokee at pounds 5 pounds.

The design I chose is a PVC hanger that hooks onto a single bicycle hanging hook. No slipping or shifting here. The hook will be roughly over the center of gravity of the plane. I used a PVC tube cutter, but the saw of your choice will work better. Warning, there are a lot of cuts, so if your body says ouch, go with an electric saw. Repetitive motion disease is serious, so if you don't want surgery like someone I know, listen to your pain.

Success! Here's my friend's garage. Four planes are out of the house. His preferred orientation is to hang the planes canopy down so they stay clean.

I found the location of the ceiling support and drilled a pilot hole for the hook. The hook is installed with the open side of the hook towards the home interior and away from the overhead door. Place the plane on the hanger and hang the hanger on the hook. Does it balance? Does it move around? Does the vibration from the door cause the plane to move? Is it strong enough? It's great! Good balance, no movement, nice vibration isolation and plenty strong. It's a keeper.



Above is a set of parts to make up one plane hangar. We cut the foam ahead of time and fit it on the lower pipe before gluing for a more finished look.

Parts list: Home Depot or Windmill Sprinkler
Total 5 feet PVC pipe (get extra for mistakes)
(9) 90-degree 3/4" elbows, (8 if you sub in a 45 degree for low-profile)
(2) 12" pieces of 3/4" PVC pipe (bottom wing support)
(2) 11" pieces of PVC pipe (Vertical drop)
(2) 4" pieces of PVC pipe (Horizontal adjust length for C.G.)
(2) 7" pieces of PVC pipe (Top angle)
(1) 45-degree 3/4" elbow (for a low-profile look)
(1) Vinyl Coated Steel Screw-In Bicycle Hook $1.48
(2) 14" of 1" poly self-sealing pipe insulation comes in 6' length $4.44
(1) Can of PVC cement
(1) Can of PVC cleaner or acetone to clean off marking (optional)
The price per rack is about $15 with the bicycle hook.

Here are a set of hangers of the same profile. When gluing them up, pay attention to the bottom width so you clear landing gear. I biased outside the gear, but since these are hung upside down, going narrower may be to your preference. A shorter garage ceiling may call for a shorter upright and a 45-degree elbow on top, so you hug the ceiling closer.

Sizing for Electric Power by Fred Cronenwett

In case you missed it from the August 2024 edition of Model Aviation…

The difficult thing with electric motors is that you can't just look at the motor and know what size of propeller, battery, or ESC to use and how much power they have. You need to see the specification sheet about the motor. That will tell you what size of battery the motor was designed to use and how many amps it will pull. Some electric motors are designed to spin small propellers, while others turn larger propellers.

I start with the weight of the model and what size of propeller will fit it. Electric motor power is measured in watts, which is the battery voltage multiplied by the amps. The larger the battery you pick (voltage), the more power you will have. LiPo batteries come in different sizes, which is determined by the series (S) cells. You will find 1S and 2S up to 6S, which determines the voltage of the battery.

I use the rule of 125 to 150 watts per pound to determine how much total power I will need for the model. If the model weighs 10 pounds, you will need a motor with 1,250 to 1,500 watts of power. The propeller you choose will make a big difference with how much power the motor produces.

It's not uncommon for electric motor companies to have several variations of the motor with different Kv values. One example is the Power 60 from E-Flite that has 400 Kv and 470Kv versions. They both turn the same size of propeller, but one has 50% more power than the other. The higher power version requires an 85-amp ESC, while the other version requires a 65-amp ESC. Both motors have the same physical dimensions and use the same battery.

After you have found a brushless motor that has the power you need and turns a propeller that fits the model, you need to decide where to put the battery and the ESC. You want the battery to be located somewhere in the model so that you can easily remove and replace it at the flying site after the model is assembled and ready to fly. The location of the LiPo battery can also be used to establish the center of gravity of the model.

If you are flying a model with two or more motors, take the overall weight of the model and divide it by the number of motors. Using the 10-pound example with two motors, the overall

power of 1,500 watts will not change. The combined power from the two motors has to add up to the overall power that is required. Two 750-watt motors would work for this example.

Before you start building, decide how many batteries you are going to use and where you will place them. The nominal voltage of a charged 4S battery is the same regardless of the mAh rating. If you need more flight time, increase the mAh rating on your LiPo battery.

If you need a 6S battery, you can put two 3S batteries in a series, which will have the same combined voltage as a 6S battery. If you need more of an mAh rating to increase your flight time, you can put two batteries in parallel.

You should also consider using an arming plug in the circuit for the electric motor, which allows the circuit to be dead until the arming plug is installed. It completes the circuit to feed power from the battery to the ESC.

The ESC will have a nominal number of amps that it can handle without failing. You do not want to pair a 40-amp ESC with a motor that is going to pull 65 amps from the battery.

Understanding RC Helicopter Controls

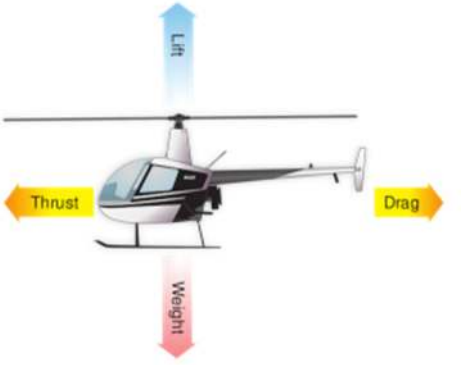
From time to time I come across some very good instructional material on the web and found a great site called RC Helicopter Fun that has detailed and user-friendly articles and videos that demystify RC helicopters. Particularly helpful and informative is the article Understanding RC Helicopter Controls On Our Helicopters by John Salt - Updated December 2024. What follows is an extract of the article with the links to the very important video clips and related informational web pages.

The Swashplate & Rotor Head Provide Collective & Cyclic RC Helicopter Control

Helicopters, both RC & full size are fascinating machines! They are mechanically complex. The flight principles and physics that allow them to do what they do, and do so well, really hits home while you are flying one.

We'll be covering the most common and basic questions I had when I got in the hobby. The goal is to give you enough information to understand why a RC helicopter can fly and how we control it from a RC radio (RC transmitter). You must first understand these basic principles before you can setup and fly a RC helicopter.

Once a helicopter leaves the ground, it is acted upon by four aerodynamic forces; thrust, drag, lift and weight. Understanding how these forces work and knowing how to control them with the use of power and flight controls are essential to flight. They are defined as follows:



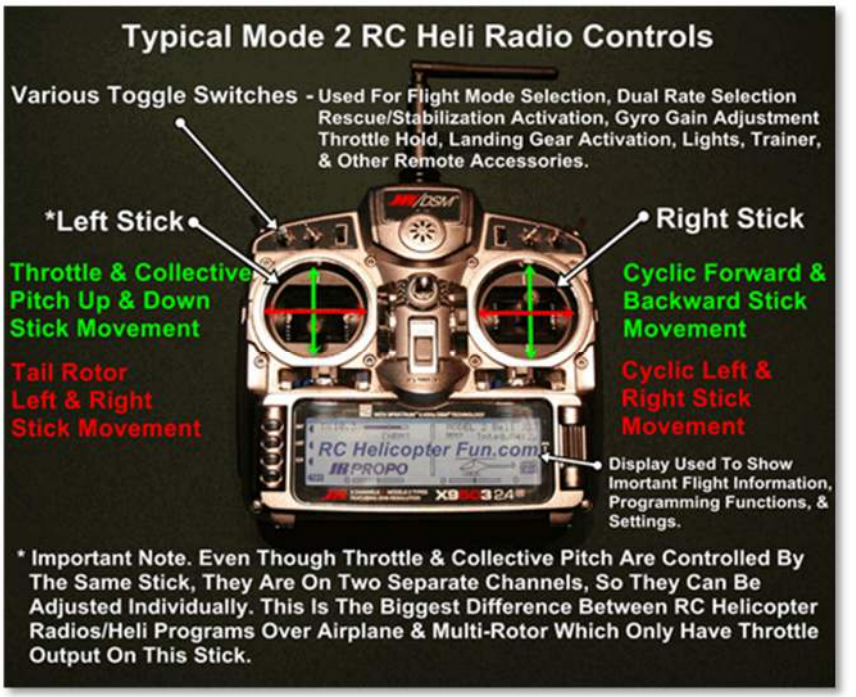
Four Main Aerodynamic Forces Acting on All Helicopters

- Thrust—the forward force produced by the power plant/propeller or rotor. It opposes or overcomes the force of drag. As a rule, it acts parallel to the longitudinal axis. However, this is not always the case, as explained later.
- Drag—a rearward, retarding force caused by disruption of airflow by the wing, rotor, fuselage, and other protruding objects. Drag opposes thrust and acts rearward parallel to the relative wind.
- Weight—the combined load of the aircraft itself, the crew, the fuel, and the cargo or baggage. Weight pulls the aircraft downward because of the force of gravity. It opposes lift and acts vertically downward through the aircraft's center of gravity (CG).
- Lift—opposes the downward force of weight, is produced by the dynamic effect of the air acting on the airfoil, and acts perpendicular to the flightpath through the center of lift.

For a more advanced and in depth explanation of the theory and physics of how helicopters fly, **refer to** FAA Aerodynamics of Helicopter Flight PDF. It's on the technical side but easy to grasp,

and well worth the read if you have a passion for helicopters and really want to understand all the physics going on in more detail.

Now let's turn our attention to the radio (transmitter).



The video below demonstrates how this mode 2 radio controls a RC helicopter.

Now that we know how the radio imparts control movement to the helicopter, let's look at how these controls cause the helicopter to move around and fly.

The single rotor collective pitch RC helicopters are, at first, not easy to fly. They have the exact same controls and follow the same laws of physics as full size helicopters. The first step is to understand these forces and laws. It will then be an easy matter to understand how a helicopter is controlled. To make this as simple and basic as possible, we have broken helicopter flight and control down into three very basic areas:

- **Lift and Collective Control**
- **Direction and Cyclic Control**
- **Torque and Tail Rotor Control**

By fully understanding these three basic areas of helicopter flight, you will have a much better idea of how helicopters fly and understand RC helicopter flight controls much better.

Here are also some videos explaining and demonstrating RC helicopter controls and basic heli flight physics.

The Three Basic RC Helicopter Controls –

Visual Demonstration of Collective & Cyclic Lift, Direction, & Torque

How Do RC Helicopters Fly Upside Down

Now let's look at two other areas of helicopter flight theory that are a bit more advanced. By understanding the first three, these two will make more sense. They are not crucial to understand, but it is nice to know they exist and how they affect the RC helicopter controls.

- **Ground Effect Hover**
- **Gyroscopic Precession**

Finally, here is an excellent training video going over all these helicopter controls on a full size Robinson R22 helicopter. Even though it's full size, it shows the exact same control set that we use on our collective pitch RC helicopters.

Understanding RC helicopters take time. Unlike RC planes or cars, RC helicopter controls seem a bit abstract. However, you now know how a helicopter flies and how to control it. Visualize yourself in a nice solid hover. What happens if the heli starts drifting to the right? What control input do you give and what is happening on the helicopter to achieve the result from that control input?

If you can think and visualize what your helicopter is doing before you even begin learning to fly, you will have a big advantage over others who slowly learn these RC helicopter control basics by the costly ***"crash & repeat"*** method.

Happy Flying…….

Princeton

REGULAR FEATURES

The Recreational UAS Safety Test (TRUST)

What is TRUST?

The law requires that all recreational flyers pass an aeronautical knowledge and safety test and provide proof of passage if asked by law enforcement or FAA personnel. The Recreational UAS Safety Test (TRUST) was developed to meet this requirement.

TRUST provides education and testing on important safety and regulatory information. If you fly your drone recreationally under the Exception for Recreational Flyers, you must pass the test before you fly.

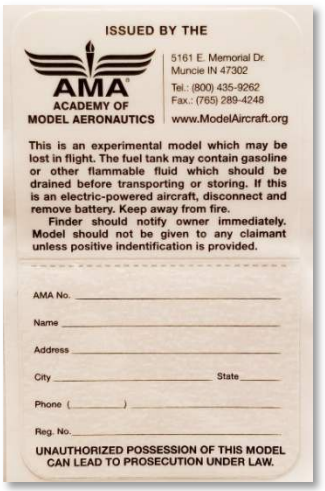
TRUST was developed in collaboration with drone stakeholders to determine content, and how it would be administered. Since June 2021, we have worked with a group of approved Test Administrators to provide TRUST as an online test. We in the FAA provide the TRUST content to the approved test administrators who, in turn, provide the online test to you, the recreational flyer.

Renew your AMA before it expires!

https://www.modelaircraft.org/membership/enroll

Renew your PRBCA club membership before it expires!

https://www.palmbeachrc.com/join-or-renew



To help you comply with the AMA/FAA regulations of having identification on all your airframes, the AMA sells stickers that can help.

This adhesive-backed label has fuel-proof adhesive and space on the bottom for your name and address. A clear plastic flap seals over your information to protect it. One of these stickers on or in your model complies with the Safety Code requirements for identification and will help recover the model if it is lost. 10 labels per pack. Id labels measure 2.125" x 3.5".

Item: 5084 Airplane ID Label 10Pk $3.99 as of today 1/1/2025

Click the link below to get to the respective web page on the AMA site:

https://shop.modelaircraft.org/product/5084-airplane-id-label-10pk/398?cp=true&sa=false&sbp=false&q=false&category_id=16

You MUST have a current AMA membership card to fly at Westervelt Field. This is a requirement of the Palm Beach County Parks & Recreation Department.

Also, please note that we will not create your PBRCA membership card unless you have a current AMA membership card. The Club Membership form is available on the PBRCA web site, www.palmbeachrc.com or at the field in the press box.

Club E-mail Notifications

You should be receiving e-mail notifications for the monthly general membership meetings and semi-annual newsletter publication. If you are not receiving our e-mails, please let David know your e-mail address and we will update our records (David's email: pbrca.info@gmail.com. If you want your name & phone number removed from our website list, also contact David at: pbrca.info@gmail.com.

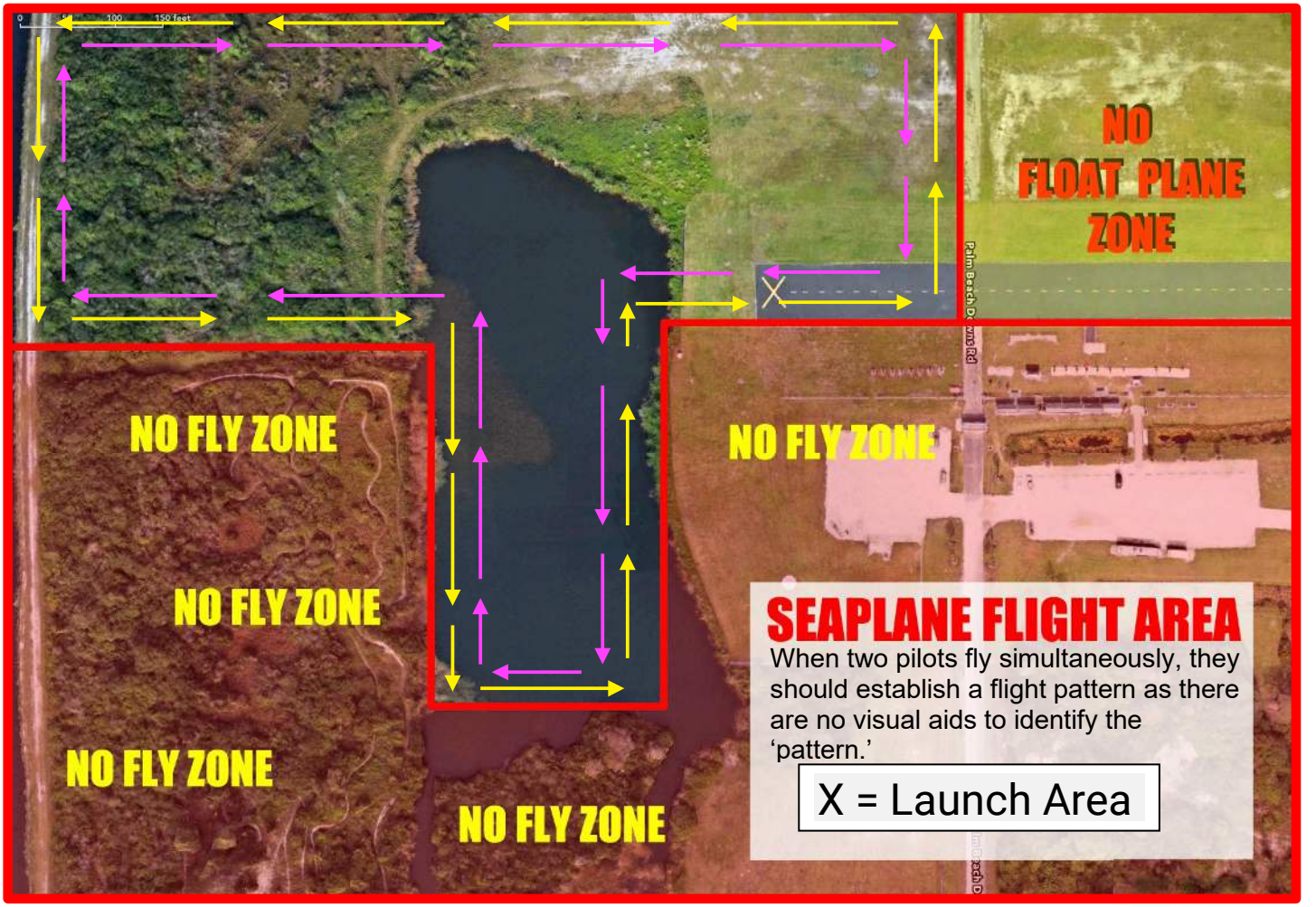
FAA sUAS REGISTRATION

All sUAS (small Unmanned Aircraft Systems - (0.55 lbs. up to 55 lbs.) pilots must register with the FAA. Furthermore, once registered, you are required to affix your assigned FAA Registration number to the 'exterior' of ***every*** aircraft you fly. For more information and registration online go to: https://faadronezone.faa.gov/#/

Click this link for the Club Safety Rules: Flight Safety Rules

Float-plane Flight Area

The membership has approved the proposed rules for flying off 'West Lake' in April 2018. The



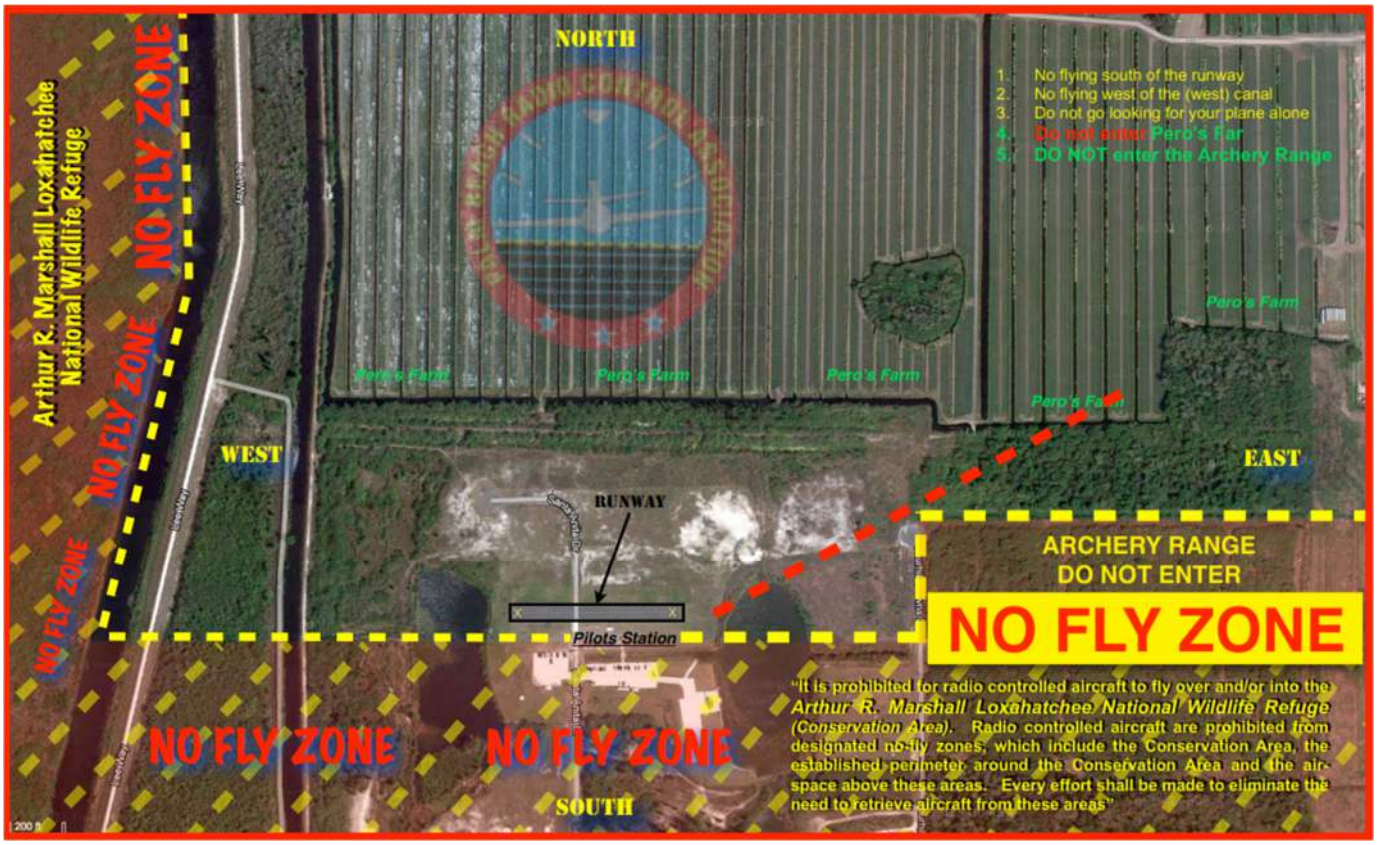
changes and additions are now incorporated into our Safety Rules.

The revised safety rules and the map have been posted on the window of the press box and on our website, and can be accessed at:

Flight Safety Rules

Land-based Flight Area

Palm Beach County has previously established “flying” boundaries and we need to adhere to those restrictions. This is an aerial map showing the boundary lines for West and South flying, and it is also posted in the bulletin board located at the “impound.” Our club has already been warned about flying over the Everglades by a Federal Wildlife Officer. You must fly within the designated boundaries!



PBRCA Battery Charging Station
(Operating Principles)

Note that for fire safety concerns, all battery charging must be done outside of the Press Box and at the charging station. It is against Club Policy to use the 110-volt AC power strip inside the Press Box for charging batteries inside the Press Box.

For the best charging experience while using our DC-volt charging stations, users should keep the following Operating Principles in mind:

- Plan on connecting your battery chargers to the 4mm banana plug connectors on the DC Power Strips, using connecting wires ideally 24" long with banana tip plugs.
- To protect the DC Power Strips from fire, battery chargers and batteries should be placed on the wire shelf below the metal boxes that house the DC Power Strips. Please avoid placing items in the metal boxes.
- Battery charging must only be performed when the Smart Batter Monitor shows the charging system's voltage above 12 volts. For example, in the screenshot the system is reporting 14.1 volts, so charging would be safe since it's above the minimum 12 volts.

- Users must charge their batteries within the following operating parameters of the DC Power Strips:
    - the maximum output current for each position is 24 Amps, **AND**
    - the total maximum current is 50 Amps.
- Multiple users charging at the same time should coordinate among themselves to stay within the operating parameters of each charging station to avoid overloading the system.
- For safety and convenience, the charging stations are equipped with resettable circuit breakers. In the event a circuit breaker is tripped, first locate, and correct the offending connection(s) and then reset the circuit breaker.

Happy and safe charging!

https://trust.modelaircraft.org/