Servo Chatter

DECEMBER 2022 ISSUE

President's Message

By Steve Smith

Hello Tomcats,

Happy Holidays! As the year comes to a close, we are preparing for another successful flying season in 2023. This is our first full calendar year of operation with vehicle access since 2016. I would like to say "thank you" to the membership for your support. Reflecting back on our accomplishments, the SCCMAS has come a long way since January to restore our operations. All of these accomplishments could not have been achieved without volunteers. We all get wrapped up in enjoying a day at the field and ignore the things that need a little TLC around the facility. Repairing even the little things can improve the experience for you and other members. Over the year, seeing members go out their way to repair an electrical outlet, replacing the wind socks, emptying the trash can and restoring the iconic "Tomcats spinning wind gauge" shows a passion to keep our field top notch. We have one of the best flying facilities on the West Coast with access 365 days a year, 8:00AM to sunset. This is something to be proud of!

As 2023 nears, please make sure to send in your renewals for processing before December 31st . To date we have received an overwhelming amount of renewals.

2023 cards are already appearing at the field. If you are a current 2022 member and did not receive a 2023 renewal package, contact us at renewals@sccmas.org.

A 2023 renewal package has been mailed. Beginning January 1st 2023 you must have a 2023 membership card to fly. In addition the entrance road gate combination will change, the new combination is located on the back our 2023 SCCMAS card.

Looking forward, discussions have started around restoring "club based" events at the field in 2023. Based on the access road restrictions and feedback from the membership, we are considering a Fun Fly, Warbird Extravaganza, and a Summer Fly In-BBQ. The R/C Swap Meets will continue to be hosted off-site. As part of this our event coordinator will be looking for volunteers to help organize and run the events.

Enjoy your time flying, and see you at the field!

Steve

Tomcats Reminder:

–All Tomcats Members must lock the main entrance gate behind them each time they enter and leave the SCCMAS Flying Field.

From the Editor's Desk

Newsletter Editor - Liam O'Connor

Greetings Tomcats -

Welcome to the December 2022 issue of Servo Chatter. The hot summer months are well behind us, and we are now enjoying cooler weather and excellent flying conditions, aside from the occasional rainy days. I love watching our grass become green again this time of year!

It is nice to see that things have been very busy at the field over the past few months! We had our August 2022 club meeting at the field, along with show & tell and the return of the SCCMAS raffle. There was a great turnout, a very informative meeting, another delicious Barbeque lunch, and plenty of Tomcats camaraderie.

Also, several of our members won fantastic prices at the club raffle (see details and photos in this issue). If you could not attend our last membership meeting, we look forward to seeing you at our next one. Remember to bring your latest project for show & tell to receive a free raffle ticket!

I would also like to remind our members that if you have anything you would like to share in our newsletter, please send it to me at the email address below. We are always on the lookout for stories, articles, building tips, photos, etc. that we can include in Servo Chatter.

I hope all of you will enjoy this issue, which includes key information from SCCMAS leadership and volunteers, a recap of our quarterly club meeting, a summary of upcoming events, plenty of photos of our recent activities at the flying field, and an excellent construction article by SCCMAS member Andy Keates, detailing how Andy designed and built his RC Glider Winch system.

Until our next issue, I wish all of you a fantastic holiday season full of flying, fun, and happy landings.

See you at the field!

Liam

servochatter@sccmas.org

Cover Photo: courtesy of Steve Smith. Mike West buddy box training with a new student pilot.

Fixed Wing, Drones, and Helicopter Flight Instruction Coordinator

Dave Neves

Congratulations New Pilots!

New member Robert Sharrock has completed his flight training and was soloed on September 18, 2022. He was soloed by Mike Leggett and trained by Mike as well.

New member, Perm Natarajan has completed his flight training on October 15, 2022. He was soloed by Dave Neves. Perm now joins his dad, Krishnan, who was soloed on March 2, 2022.

For anyone who is interested in flying a model airplane, but does not have a plane yet, please contact me and I would be happy to take you up on a buddy box flight on my club trainer. Just give me a call or email at: (510) 673-4467 or rcheliguy7@gmail.com

We now have a number of additional instructors who are available to help with flight instruction. If you are a new member who needs help, please check with them for their availability. You can find their names and contact information on our website in the training section.

Thanks,
Dave Neves

Fixed Wing Flight Instruction Coordinator

Mike Leggett

The Phrase “It Will Be OK” Has No Place in Our Hobby

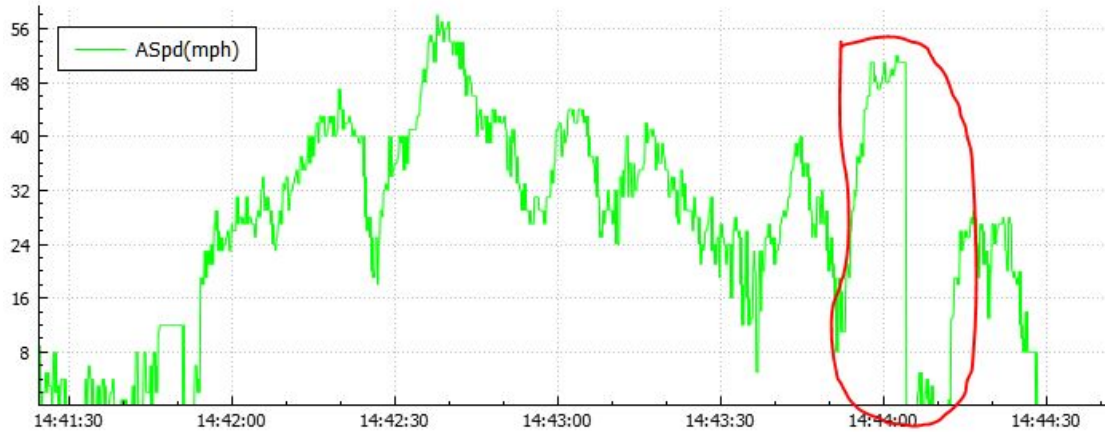
I recently flew my Scratch built B26 again for the first time in a couple years.. maybe it was at the warfest in Tranquility.. I don’t really remember. I ran up the engines at home and checked over the whole plane and all was good a couple of months ago. Last Sunday during the preflight runup, the right engine idle was a little high and I made a mistake bringing down the electric contribution instead of the G38 level. At idle, the electric was already nearly off so I had to trim it down allot to decrease the idle. This should have set an alarm off in my head, but it had been years since I have adjusted trims and memories fade. I only did a runup to half throttle and the RPM sounded close together, but I should have checked the reported RPM and noticed that the right was below the left. The second "It will be ok" was in that I was getting an audio report of low flight battery, but the telemetry screen said it was 31 volts (8s: 33.2V max). Then I realized that I was not getting an air speed report which I had set to about every 15 seconds. Well I didn't really need that (it will be ok #3). So I taxied out and took off. The plane pulled a little to the right on takeoff but it was easily managed with the rudder... again not setting off an alarm. I went through the pattern half a dozen times, did two practice approaches and called landing. Flying straight and level as I started the downwind leg, the B26 slowly drifted right and spun in from about 600 feet. A total loss (see photos on following page).

“It Will Be OK” (Con’t)

Telemetry data for the entire flight was logged on my transmitter. Not all of it adds up to what I observed but there is a lot of data. The first is the pitot airspeed of the entire flight. The plane should stall below 30mph so I suspect the pitot has a linearity problem. The plane appeared to be fling plenty fast. The drop to zero mph in one sample state (1/10 second per sample) seems impossible but at least marks when is all went south. The next plot is of the signal strength, Left rpm, Right rpm and airspeed. I multiplied the RSSI and airspeed by 100 so I they could share the vertical axis scale on the graph. The third plot is of the final stick inputs where you can see my entry and exit of the 90 degree turn downwind just before the reported airspeed dropped from about 50 to 0.

I suspect that the right engine froze up (even though the reported RPM did not show it) because its temperature was 480F resulting from turning the 24x12 prop without much help from the electric. In contrast, the left engine was at 150F. The receiver and all the servos still function correctly in the pile of debris. One thing I found was that the static input to the pitot was plugged. Someone pointed out that the airspeed input was plugged prior to the flight and I cleaned it. but did not check the static. I think this explains the inaccuracy of the airspeed indications in the telemetry data.

Telemetry logs



SCCMAS Field Upgrades - New Webcams!

SCCMAS is in the process of upgrading to all new HD webcams at our field. So far, the new Runway Cam has been installed (see above), and the other HD cameras will be installed in the near future!! Visit our website (www.sccmas.org) to see for yourself! A big thanks to our Club Officers for making this happen, especially Mike Luvara.

SCCMAS Officers and Volunteers

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Construction Article

By SCCMAS Member, Andy Keates

An RC glider Winch

I thought I'd try keeping a glider in the air by searching for thermals. I have telemetry to report height and rise/sink rate back to my transmitter, but getting the glider up there is tricky. Here's what I learned.

- Slope soaring is fun if you have the right wind speed in the right direction and are willing to drive to Waddell Creek, Sunset Beach, Coyote Hills or Mission Peak in the hope that it's going to work.
- Towing the glider up presents several options.

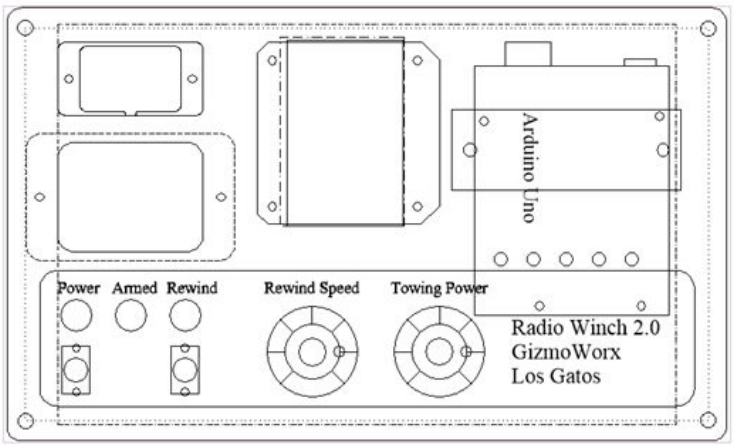
    1. If you can rely on a buddy with a tow plane, I'm sure that's fun. I don't have that.

    2. You can buy a simple bungee/hi-start. That works OK, but the line length is fixed, and the pull diminishes as the rubber contracts. It's foolproof, though.

    3. You can build a pedal-activated winch, with a line that runs to the end of the field, round a pulley, and back to the glider in your hand. You get full power over the entire launch, or you can pulse the pedal to get lesser pull, relying on the stretch in the line to keep smooth.

    4. You can build a radio-winch that allows you to put it at your feet, or at the far end of the runway. The radio throttle lever controls the pull.

I built that last option, and this is what I learned. If you want details, you can email me at *andy@gizmoworx.com*. I used CAD/CAM and a small CNC machine (a laser cutter would work too) to cut the box openings and cut/engrave the control panel. I have a small CNC machine in my garage. I chose an Arduino board for the digital logic because they are easy to program.



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Winch performance and usability

The motor controller will handle 43A at 27V (ie two fully charged lead-acid cells in series), so about 1000W of power if you need it. That's the heat sink protruding out of the middle of the box. I have a 300W DC motor, which works well with 2m sailplanes. I run it at about ½ power if there is wind, about ¾ power if there isn't. The "Towing Power" knob sets the maximum power, and the throttle lever adjusts up to that maximum at any time in the launch. The winch works placed at the far end of the runway if you have a line of sight to for the radio.

With the winch at the far end of the runway and the transmitter in your hand, you can walk left or right to get exactly downwind of the winch and launch directly into the wind, which is not something you could not do if the winch switch were at your feet. It's also simpler to have one run of line than having a line that goes up the runway, over a pulley, and back again. It's pretty easy to get 400ft of altitude. When the telemetry vario stops beeping you just kill the throttle and then dive a little to release the hook. When you are done for the day, the rewind switch activates the rewind knob, with which you can reel the line back in at a speed of up to ¼ of the maximum speed.

I'm very happy with the result. It also has a built-in safety feature that you have to deliberately arm it with the gear switch when the throttle is at zero. You don't want to accidentally run the line by knocking the control lever before you are ready.

Drive details

The control box uses the "pulseIn" function on an Arduino microcontroller board to read the pulses from the receiver. This command reads in the pulse width in µs, from a pin I defined earlier as the aux signal from the receiver and gives up after 100ms if no pulse appears. It's a convenient way to read the setting on a channel. The coding is …

```
pulse_time_aux=pulseIn(aux_pin,HIGH,100000);
```

This command reads the pulse on the pin "aux_pin" (fed from a servo channel) to return how long the servo pulse was high, and gives up after 100,000µs if no pulse arrives. The result is stored in the pre-defined variable "pulse_time", which give the pulse width in µs. Once you have a number for the pulse width (ie the position of a lever or switch on the transmitter) you can do what you want with that information, like implementing the logic to arm the winch. The Arduino has analog input pins to read the position of the knobs.

The Arduino board reads the position of the right ***towing power*** knob (see box illustration) to divide down the maximum power to something less if you need it (i.e. it's windy or you have a smaller glider). The ***armed*** LED tells you that it's ready to go – that you flicked the gear switch on while the throttle was low. The ***rewind*** switch switches control from the receiver to the ***Rewind Speed*** knob for rewinding the line at the end of the day without needing the transmitter. The analog out function of the Arduino provides a pulse-width signal that directly drives the DC motor controller.

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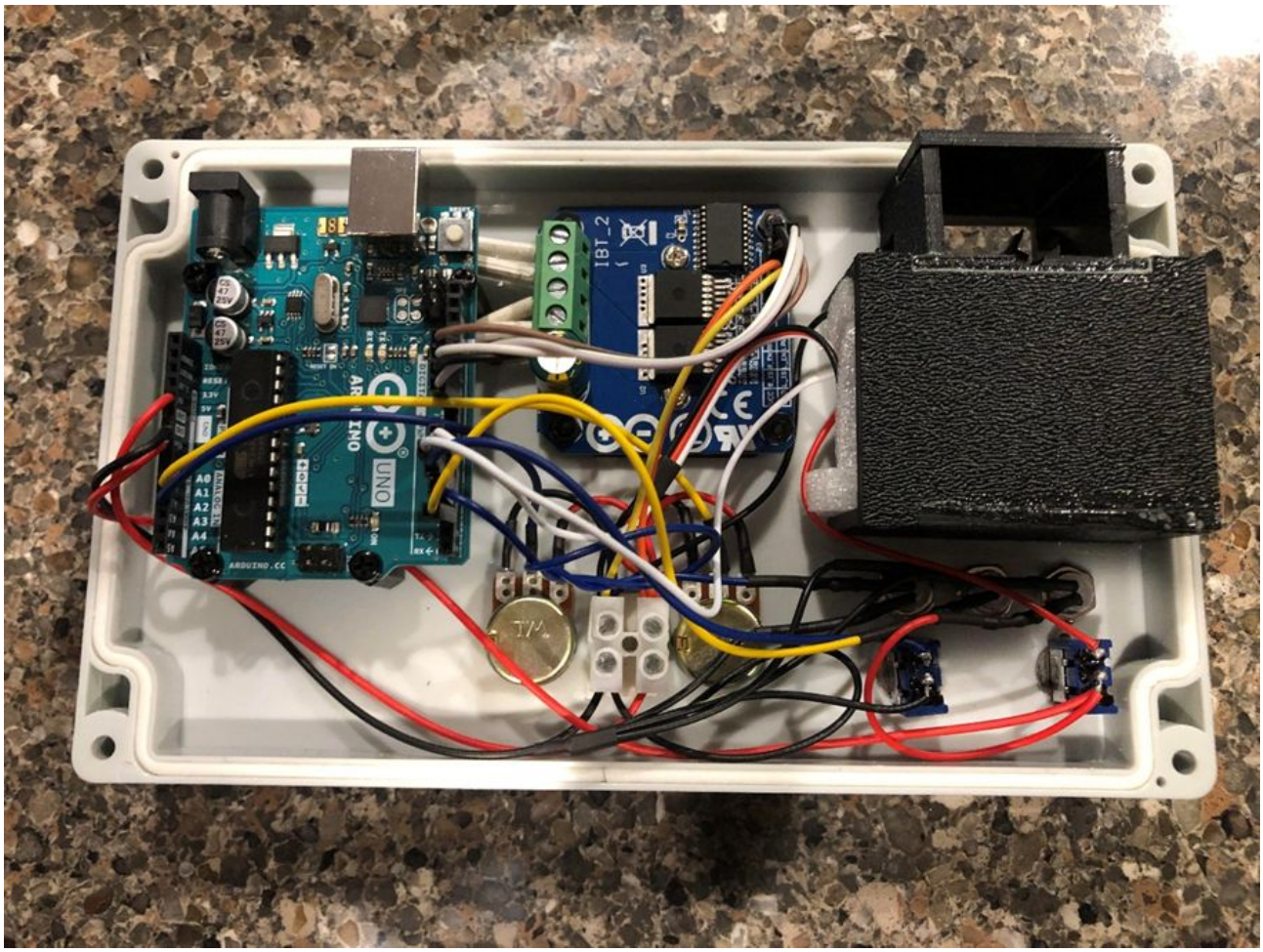

Operational practicalities

On a couple of occasions, when I throttled back and forgot to kill the winch at the top of a climb, the line reeled in with no tension and created a tangled mess of line on the reel. Bad idea. Also, any line with twisted strands will twist in on itself and you'll have a pile of spaghetti to untangle. Use braided fishing line, preferably multi-colored, so you can see it in the grass! I added a line guide to the winch (a cupboard door handle from Home Depot) to ensure that the line feeds the reel even if the line has blown left or right of the winch. That's just visible on the left of the first photo, next to the reel.

The last practical point is that a receiver binds not just to a transmitter, but to a specific model in that transmitter. For this reason, I put the receiver under a transparent hatch (middle left, on the box top). I can see the orange LED go on when the bind is complete.

Continued on following page

If I go to a different glider programmed into the transmitter, I have to unscrew the hatch to press the receiver bind button and bind the winch receiver to the new model. The clear hatch means I can see that the receiver is indeed bound to the transmitter, because it has a solid orange LED shining. When Binding I need to remember that Spektrum receivers have a "safe mode" if radio contact is lost. It's important to bind with a safe mode preset that disables the winch so you don't get it continuing to operate if radio contact is lost.

Summary

This was an interesting project, and the winch works very well. I have the design files in TurboCAD and can export to AutoCAD and other formats if anybody wants details. The biggest issue I had was finding a suitable reel. In the end I made one from PVC plumbing parts and cut out an aluminum drive plate to connect it to the motor spindle. I was going to say that, unlike aircraft, you can't crash this project. Well, actually I did! Mark II got lifted off the ground and dragged 30 feet or so down the runway … meaning that a glider can lift and drag two lead acid batteries and a pretty heavy 300W DC motor. I stake the winch down now!

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Did You Know?

–The speed limit on the SCCMAS Vehicle Access Road is 15 MPH.

From the Archives

By Tim Jones

Note: This was originally written and printed in July, 2004

A Summer Day at the SCCMAS Field

The fliers are out. There are questions. Will it be fun? What might we have to do? Can we get a team together? What's a team? How long will we have? What do we need to bring? The flier generated a lot of questions. As some were eventually answered, a good memorable time developed.

The flier? The flier was part of one of the club newsletters. The flier announced an event for one of the weekends at the field. The event, "Junkyard Wars". Junkyard Wars? Junkyard Wars is most notably known from a popular TV show where a couple of teams are pitted against each other and both teams race the clock to design and build some sort of machine to do something. Typically using major materials from a junkyard.

I've been around this club flying field for about three years now. I've seen a lot of perfectly good balsa and covering turned into junk. A lot of it repairable. So, a "junkpile" was started at the field. This pile started with a couple of wing and fuselage sections. One of them was my own donation of a previously salvaged and repaired P-51 Mustang that I had brought and showed proudly at the previous club meeting. Note, lesson learned, for any aircraft to remain in the air some combination of air speed and or altitude must be available. The P-51 "requires" a considerable amount of at least one.

Will it be fun? Let's see, a Saturday, outdoors in the Santa Clara Valley, with friends, building and flying a "new" airplane. How could it possibly be anything but fun? I'm in!

What might we have to do? Who knows? The rules are kept secret, but everyone will have to do the same thing. So, let's find out.

Can we get a team together? Well, if there's a we, there's a team started already. What's a team? Let's call it four. What will we have to do? That's in the secret rules. How long will we have? Same secret document. What will we need to bring? What do you have?

So we've got a team together. We hold a small prep meeting the Wednesday before to get a list of tools, parts and assignments together. The fun is already started. New acquaintances are started. The lists and E-mails as reminders are crossing the wires to make sure we're set to have a good time. Radio, engine, control hardware, tape, zip ties, building board, iron, batteries. Good grief, does it really take this much stuff to build a plane?

From the Archives, Con't.

Show up Saturday, pick a spot to set up and start unloading. Holy crap! We need more space for all this stuff. The announcement is here. We're told how much time we're allowed to build an airplane and what the plane will need to do. We're told we will be given an assortment or glob of balsa and some glue to build with. We're given a coupon to buy something from the "junkpile" to build on or from. We're told that the goal is to build a plane to perform a couple of typical maneuvers and stay in the air for the longest time possible on a limited amount of fuel. Sounds like fun. We have about 15 minutes to work up a plan before the junkyard is open for business.

Wow! We have lots of ideas. We also have four "better" ideas. We work our way through and agree on a plan. The plan will be to build around a wing. Preferably a high mount flat bottom wing. Steve goes off to buy a wing. Bill and Ken start laying out a fuselage. I start sorting tools and hardware. The wing arrives. The fun continues. We built an "airplane"(?), ready to fly, in about three hours. No bandages were needed, go figure.

Who's gonna fly it? We, as a team, thought it would be in the true spirit of the day that every one in the team takes a shot at flying this machine. But, someone had to be first. I took the chance. If it cracks up, we get to fix it and try again, or we're out for the day. We may even have to work a deal and buy another wing. No pressure. But here goes.

Hey mom, watch this accident! It flies! It flies! Cheers and laughs from behind and in the pits. I hope it floats good, because it doesn't climb well. Did we put the prop on the right way? I survived the test flight. I landed it. It was still usable. Someone else is next. We flew it through the three flights in the event. We placed a respectable (we felt) third, of six teams. And the plane was still usable. High fives all around.

Recap of the day? I think I speak for all participants is saying, we had a great time. We shared ideas. We all had little tricks and new tools to share. We shared laughs, concerns and experiences. We watched other teams do the same. We enjoyed spirited jabs at the other teams. We took ours too. We watched six different airplanes emerge from the rubble. Even the rudder from the Mustang showed up on a plane. We developed new friendships. Yeah, we all had a great time. That's what a club is for. The plane did eventually die. But that was after all of the activities and pictures. There are pictures. There are stories. I'll bet some of the stories become legends.

Bottom line. If you missed participating in the event, you missed a good time. Plan on next year. The suggestions for rules and activities are already in the works.

See you then!

AMA/FAA News

FAA Publishes AC 91-57C and AC 89-3

AC 91-57C | CBO | FAA | FRIA | October 25, 2022 / Holly Silvers /

The FAA has published Advisory Circular (AC) 91-57C, which outlines the requirements for community-based organization (CBO) recognition, as well as AC 89-3, which outlines the FAA-Recognized Identification Area (FRIA) application process. AMA has provided a list of FAQs for both Advisory Circulars at modelaircraft.org/amainaction.

AMA was the first organization to apply to the FAA for CBO recognition. After the application has been fully reviewed, we will update our members on AMA's CBO status.

Finally, the FRIA application process has been opened; however, it is not yet functional for recreational users. AMA will apply on behalf of our clubs when the FAA begins accepting these applications.

To remain current with the most recent government-related news, regularly visit the AMA Government Affairs blog. If you have any further questions or concerns, contact the Government Affairs department at (765) 287-1256 or amagov@modelaircraft.org.

FAA | FRIA

Please note that some of this may be new to you…

In addition to your SCCMAS Membership, you need:

- **A current AMA membership**
- **An FAA Small UAS Certificate of Registration**
- **Place FAA registration number on your aircraft**
- **Complete the AMA TRUST test**

The Recreational UAS safety Test (TRUST)
https://trust.modelaircraft.org/

FAA Drone Zone Website for Small UAS registration
https://faadronezone.faa.gov/#/

https://amablog.modelaircraft.org/amagov/2021/05/11/update-to-faa-drone-zone-registration-and-renewal-process/

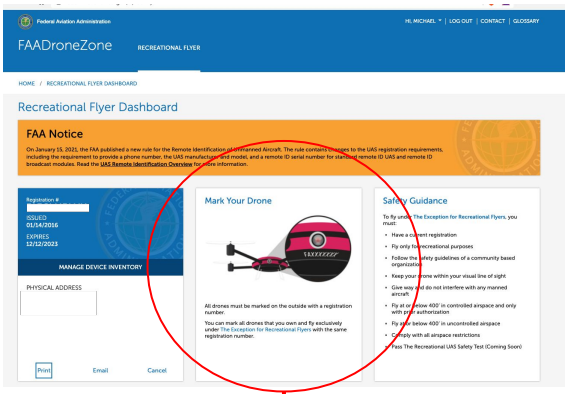
FAA Recreational Rules: https://www.faa.gov/uas/recreational_fliers/

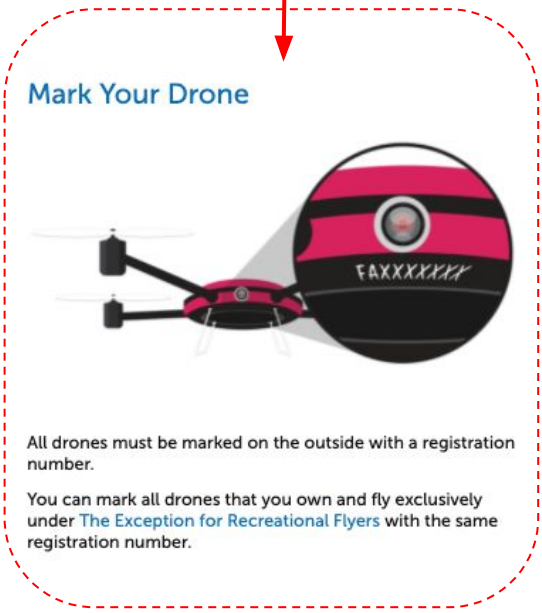
Advisory Circular AC 91-57B

AMA Safety Code

AMA Know Before You Fly https://www.modelaircraft.org/know-you-fly

FAA Drone Zone Website





Example FAA Small UAS Certificate of Registration

*This Small UAS Certificate of Registration **is not an authorization to conduct flight operations** with an unmanned aircraft. Operators of unmanned aircraft must ensure they comply with the appropriate safety authority from the FAA. To operate as a recreational flyer, a person must meet all of the statutory conditions of the exception for limited recreational operations of unmanned aircraft (49 U.S.C. 44809). Persons who do not meet all of the statutory conditions may not operate under the statutory exception for limited recreational operations of unmanned aircraft.*

For U.S. citizens, permanent residents, and certain non-citizen U.S. corporations, this document constitutes a Certificate of Registration. For all others, this document represents a recognition of ownership.

To fly under the exception for recreational flyers you must:

- *Have a current registration*
- *Fly only for recreational purposes*
- *Follow the safety guidelines of a community based organization*
- *Keep your drone within your visual line of sight*
- *Give Way and do not interfere with any manned aircraft*
- *Fly at or below 400' in controlled airspace and only with prior authorization*
- *Fly at or below 400' in uncontrolled airspace*
- *Comply with all airspace restrictions*
- *Pass The Recreational UAS Safety Test (Coming Soon)*

From FAA https://www.faa.gov/uas/recreational_fliers/

What are the Rules for Recreational Flyers?

The Exception for Limited Operation of Unmanned Aircraft (USC 44809) is the law that describes how, when, and where you can fly drones for recreational purposes. Following these rules will keep people, your drone and our airspace safe:

1. Fly only for recreational purposes (enjoyment).
2. Follow the safety guidelines of an FAA-recognized Community Based Organization (CBO).
   Note: We have not yet begun officially recognizing CBOs. Recreational flyers are directed to follow the safety guidelines of existing aeromodeling organizations or use the FAA provided safety guidelines per Advisory Circular 91-57B.
3. Keep your drone within the visual line of sight or use a visual observer who is co-located (physically next to) and in direct communication with you.
4. Give way to and do not interfere with manned aircraft.
5. Fly at or below 400' in controlled airspace (Class B, C, D, and E) only with prior authorization by using LAANC or DroneZone.
6. Fly at or below 400 feet in Class G (uncontrolled) airspace.
   Note: Flying drones in certain airspace is not allowed. Classes of airspace and flying restrictions can be found on our B4UFLY app or the UAS Facility Maps webpage.
7. Take The Recreational UAS Safety Test (TRUST) and carry proof of test passage (coming soon).
8. Have a current registration, mark (PDF) your drones on the outside with the registration number, and carry proof of registration with you.
9. Do not operate your drone in a dangerous manner. For example:
   1. Do not interfere with emergency response or law enforcement activities.
   2. Do not fly under the influence of drugs or alcohol.

Individuals violating any of these rules, and/or operating in a dangerous manner, may be subject to FAA enforcement action.

For more information, read Advisory Circular 91-57B.

Not sure what type of a drone user you are? We can help you!

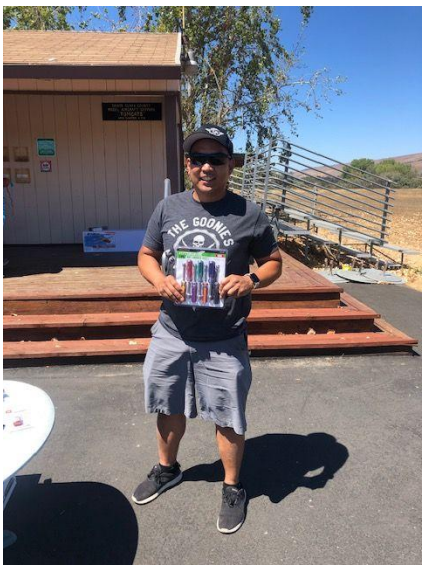
Check our website for the latest updates or follow us on social media for the latest news.

SCCMAS Members Meeting, August 28, 2022

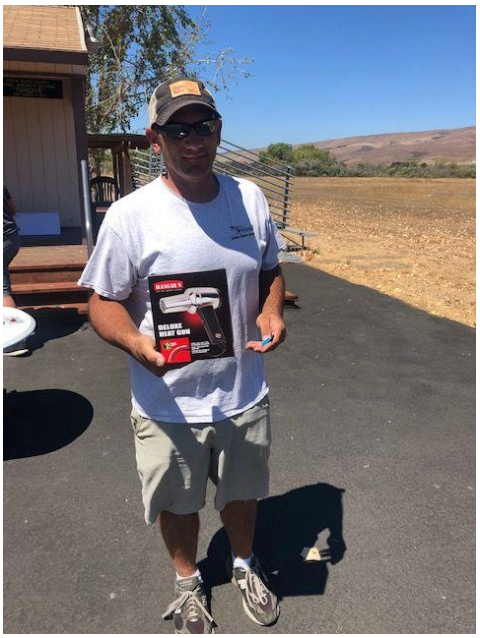
SCCMAS Members Meeting (Show & Tell)

SCCMAS Members Meeting (Show & Tell)

SCCMAS Members Meeting - Raffle Winners!



Raffle Winners (Con’t)



SCCMAS: Scenes from the Field

Above and lower right: Chris Luvar's Legend Hobby Skyraider ARC (Almost ready to cover). Chris glassed it, did the panel lines, painted and weathered it with Tamiya paint. Clearcoated with Spraymax 2K clearcoat. 86" wing. DLE55 RA for power. Robart pnuematic retracts. 28 lbs

Above: Lynsel Miller's Nieuport

SCCMAS: Scenes from the Field (con't)

SCCMAS: Scenes from the Field (con't)

The Luvara's RC parachute pilot had a hard landing, and lost his head!

SCCMAS: Scenes from the Field (con't)

It is great to see our parking lot so full and our field so active again!

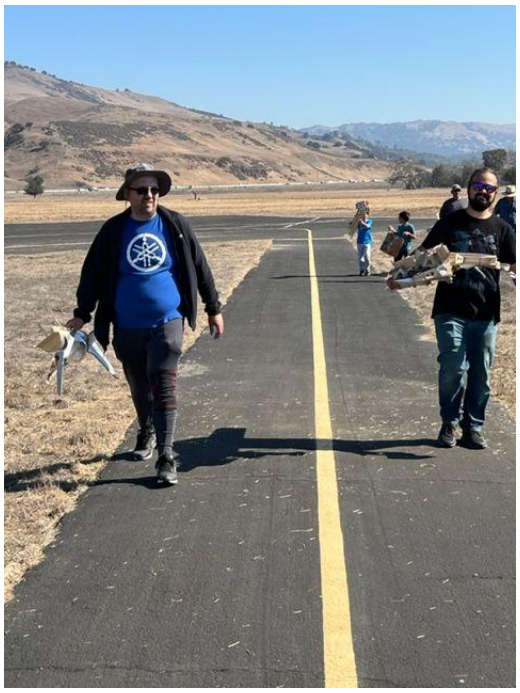
SCCMAS: Scenes from the Field (con't)

It was a hot summer at the field - 104.1 degrees, WOW!!

SCCMAS: Scenes from the Field (Accidents Happen to All of Us!)






SCCMAS: Scenes from the Field (con't)

Above: Lynsel Miller's Hellcat

SCCMAS: Scenes from the Field (con’t)

SCCMAS: Scenes from the Field (con’t)

Membership Cards Left at the Field

If you see your name below, please visit the lost & found box at the clubhouse to retrieve your membership card!

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