



April 2025 Edition

Member at Large's Corner: Bill Flathers



If you've had occasion to be out at the field on a weekday over the past 3+ years, you may have come across a team of young engineering professionals and student interns (plus a couple of "oldies but goodies") slaving over laptops, checking the CG of odd-looking flying machines, debugging a comm or autopilot issue, or even flying these machines with precise ground crew/pilot coordination with call-outs like "Alpha", "Auto", "RTL", and "Q-Stabilize". That would be MITRE's Small UAS Development Team of which I've had the pleasure to be a part of for over four years. I'd like to take this opportunity here to introduce you to MITRE and the Small



UAS Development Team, and the work we do out at Rhynalds'.

First, MITRE is one of a handful of Federally-Funded Research and Development Centers (FFRDCs) – a non-profit independent research organization chartered by Congress in 1958 - spun off from MIT-Lincoln Labs - working initially on a wide range of Cold War-related technologies such as the USAF's early warning and over-the-horizon-back-scatter radars, the first generation of large scale digital computers, and digital signal processing. Other FFRDCs include the RAND Corporation, the Aerospace Corporation, and Fermi National Labs. While MITRE has expanded into other applied technology fields over the years (including significant support of the FAA in such areas as airborne collision avoidance systems, navigation and landing systems, and controller-pilot datalink communications (CPDLC)), the lion's share of MITRE's work is for the DoD. I, personally, have been working at MITRE for over 40 years initially supporting FAA programs, but for the past 20 years or so working on DoD projects including large and small UAS initiatives.

The small UAS activity that you might see going on at the field is likely focused on one or more of the following areas: advancing the state of the art of VTOL/fixed-wing flight with new wing planforms and vectored thrust; evaluating various sensor technologies associated with remote sensing, visual odometry and scene recognition; and seeing how far we can take relatively cheap, open-source technology (both airframes and avionics) to work for first responders, law enforcement, aerial surveillance, DoD use cases.

The team we have working on this stuff is truly extraordinary - comprised mainly of early-career (most with less than 10 years out of school) electrical, mechanical, computer, aeronautical, robotics, and autonomous systems engineers – all working out our research facilities in Northern Virginia ("The Ranch" is, therefore, an ideal place to meet up!). All those who act as UAS pilots are fully FAA Part 107 certified and have been

through a thorough flight training program (in normal, non-routine, and emergency procedures), with periodic recurrent training. The airframes and integrated electronics are subject to periodic design reviews to identify both weaknesses as well as opportunities for performance enhancements. Heading out for a day of flying our new designs is the culmination of a lot of preparation of aircraft, systems, ground crew, and pilots!

On behalf of MITRE and our Small UAS Development Team, I would like to express our gratitude for allowing us to use the club field to advance this important work – it is truly the ideal place to do the kind of flying we need to do. We strive to do all our flying on the weekdays and during hours when there is low club demand for the field. However, if you are ever at the field while MITRE is present and would like to fly – please do! We usually have a lot of ground-checking that we can do, and there’s lots of ways we can accommodate club member flying on a non-interfering basis. We also learn a lot from the club’s “experienced hands” (note I did not say “old hands” – but I was tempted!) whenever we get to watch them prepare their aircraft and fly!

Wishing you blue, smooth skies ‘til next time!

Bill

President’s Pilot Box: Ernie Padgette

- No Club specific items this Month.

Ernie P.

Vice President’s Pilot Box: Nic Burhans

- Again, a big thank you to Gerald Hood and Don Szczur for again hosting FARM Club’s annual Pattern Clinic and aircraft setup/safety check out/first flights of the 2025 season. See Don Szczur’s comments below.

- No other specific items this Month.

Nic

Secretary’s Pilot Box: Nic Burhans

- The 2025 Club Membership has remained at 55 as we start the flying season.

- Our Club cooking guru, Bill Towne, has retired and turned in his spatula. President Padgette is in search of a new “Club cook” for our scheduled Club events.

- FARM Club Calendar:

Upcoming 2025 events:

April 22	Tuesday	FARM Club Zoom Meeting	7:00 PM
April 26-27	Sat-Sun	Kinston Aero Modelers Pattern Contest @ Kinston, NC CD: Carl Zavalney carlzavalney@bshg.com	All Day
May 4	Sunday	FARM Club Day & Fun Fly #2 @ Club Field Picnic, Pilot Training, and Flight Check day CD: Ernie Padgette Food: ???	All Day
May 9-16	Fri-Fri	Joe Nall @ Triple Tree Aerodrome @ Woodruff, SC www.tta.aero	All Day
May 17-18	Sat-Sun	Goonie Birds Pattern contest @ Florence, SC CD: Robert Gainey	All Day

May 27	Tuesday	FARM Club Zoom Meeting	7:00 PM
June 14	Saturday	Field Closed to 72Mhz; Open to 2.4Ghz: Float Fly #1 @ Lake Ritchie CD: Nic Burhans npb6218@earthlink.net	9:00 AM
June 29	Sunday	FARM Club Day @Fun Fly #3 @ Club Field <i>Picnic, Pilot Training, and Flight Check day</i> CD: Dave Rothbart Food: ???	All Day

Remember to Be SAFE

Nic

Treasurer's Pilot Box: Nic Burhans

- As of 10 April, the FARM Club presently has 55 members. (18 Regular members, 31 Senior members, 1 Junior member, 1 Associate member, and 4 Life members).
- As of 10 April, the Club presently has a balance of \$7,135.45 in the general fund.

Continue to Be Safe

Nic

Safety Officer's Pilot Box: Mike Wiczalkowski

- No other Club specific items this month.

Mike

Field Marshal's Pilot Box: Ralph Gaul

- No Club specific items this Month.

Ralph

Member at Large's Pilot Box: Charlie Koustenis

- No Club specific items this Month.

Charlie

Member at Large's Pilot Box: Bill Flathers

- See Above.
- No Club specific items this Month.

Bill F

Web Master's Pilot Box: Dick Sutton

- No Club website specific items this Month.

Dick

FARM Member "Tips & Projects" Box: Any FARM Member

- No Club specific items this Month.

“From the Field” Anything Input Pilot Box: Any FARM Member

FARM’s D2 Pattern and Judging Clinic

Gerald Hood hosted the judging clinic on the weekend of 15 March. For those that have participated in the past know, the D2 Judging and Coaching event has taken many forms over the years- dating back to 1995. These events have taken the form of auditorium conference seating with guest speakers, to living room – fireside chat events, to LCAA clubhouse field events to international webinars involving hundreds of participants and interviews with U.S. Team members, etc. This year, Gerald led the event and focused on Flight Coach. It was a great event. Want to acknowledge Nic Burhans and Debbie Hood for helping arrange for the A/V equipment, pizza and a warm place to eat inside her RV!



Gerald was the first to fly with Flight Coach.

Duane Beck getting ready to fly. (Yes, Its Duane with a beard and a pattern plane!)



For those who are not familiar with the Flight Coach tool, it consists of a Proton- type hardware unit about the size of a glow plug caddy that is strapped or velcro’d inside the plane. The unit records roll, pitch and yaw as well as three dimensional points in space using GPS signals. The data logger saves a file to a micro SD card which can be used to upload a flight file on to the Flight Coach website. The built in website functions to project on the screen a “ribbon” view of the flight as well as different perspectives and angles to see exactly what the plane is doing during the flight. There are other features as well, some which were discussed at the event.

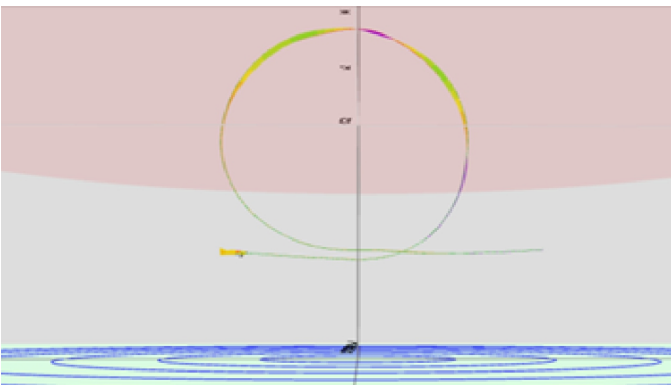
What it Isn’t...

So the first discussion point at the seminar focused on what the Flight Coach isn’t- what it can’t do. It cannot make the pilot fly better. That can only come with practice. The unit cannot show you how to fly maneuvers or how or when to enter control inputs in order to fly to perfection.

The second thing that it does not do is give the pilot confidence. It actually does the opposite. As competition precision aerobatics pilots, we like to think we fly well- we work hard at practice and to most observers the sequences we fly are truly beautiful and precisely executed. I witnessed pilots using Flight Coach during a competition practice day just before an event and in a couple of instances not only did it fail to help instruct the pilots to fly better for the upcoming competition, but caused pilots to second guess their abilities, change a flying style prematurely- perhaps without sufficient justification, and subsequently move down in the standings.

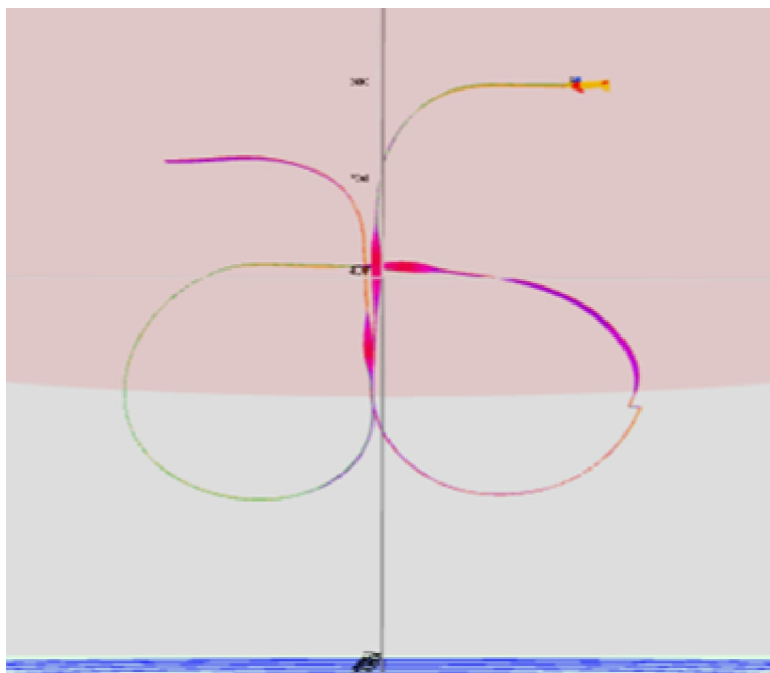
Finally, it is not useful unless the pilot can fly consistently. If a pilot cannot repeat deficiencies consistently, those deficiencies cannot be categorized and corrected. One of the pilots at the judging seminar stated that Flight Coach is really only useful for top-level fliers. The reasoning for him saying this is that he made the point that pilots just starting out in pattern will not benefit from Flight Coach. I’ll discuss this a bit more later, on the topic for building block method of learning.

Some Examples and Applications.



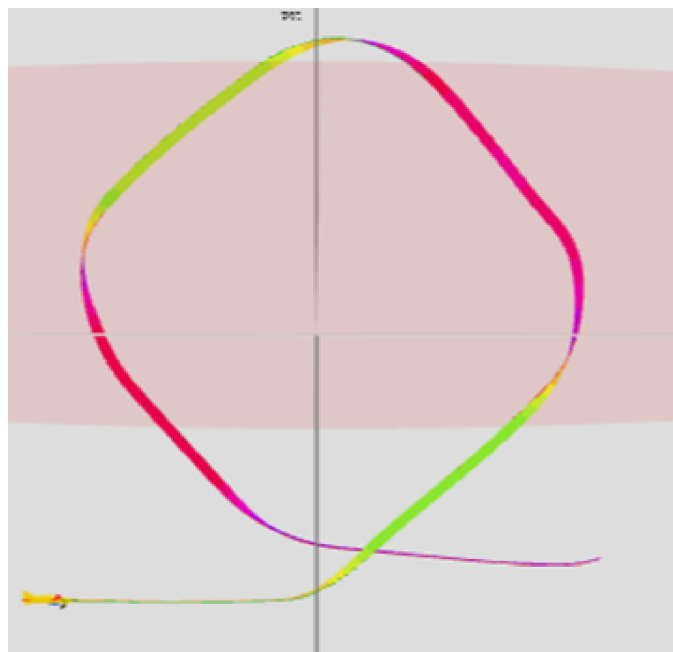
This Exhibit could be considered a loop for discussion purposes. In this instance, the maneuver is a loop with integrated rolls in the Masters/FAI P sequence. At first glance, the maneuver simply appears to be off center about 1/8 to the left and a slight flat spot on the exit with an arguably barely discernable higher exit. A pretty well executed maneuver. But on closer inspection the top rolls are centered, so there is more to it. From a pilot’s to-do list, the first is to stretch the first half loop out just a bit and tighten it just a bit on the left in order to preserve geometry. If this were a sportsman pilot just getting

started the main focus is on (1) centering and (2) superimposing (two loops). After progression to be able to demonstrate the loops can be flown consistently, then other areas can be addressed (roundness, wings level, moving in or out as shown from the top view). None of this is easy, but it reinforces the Sportsman pilot to start off with basic centering and geometry as the first building block. It also reinforces the importance of drawing box lines or at least fly with a center pole at the practice field.



This exhibit is a great illustration of an “easy” to fix deficiency. In this case the pilot simply drew too short of an up-line of the half clover. I also have seen this happen when pilots attempt to “count” to gauge line lengths. Although constant speed is strived for (and a judging criterion I might add) there is a level of difficulty in estimating up and down line lengths by “counting”. In this example, simply making the upline longer will easily add points to the maneuver and is a very easy fix. There was a small anomaly (loss of GPS signal) around the first radius so it distorted that maneuver segment just a bit but by tightening the loops in that position and on the same spot on the second $\frac{3}{4}$ loop will achieve more-perfect geometry for this pilot.

This exhibit shows a very difficult situation. All the angles in the square loop on corner are very good- very close to 45 degrees, yet a combination of small adjustments are needed to improve the maneuver geometry. In this case, the pilot would need a slightly larger radius on entry, a slightly shallower angle for the second line. This would have to be practiced repeatedly, then subsequently checked by Flight Coach to confirm the correction.



In summary, the pilots from the Judging Seminar who discussed Flight Coach agree that it is a tool that can be used to help pilots see what their airplane is actually doing. Applied optimally, it can strengthen a pilot's competitiveness if used as a feedback mechanism to avoid, as the great Dean Pappas would say “practicing errors to perfection”. It could be used to supplement or replace human scoring for pattern competition, provided it is programmed to preserve an individual's style of flying allowed for in the FAI rules and consider interpretations by the “human eye” of the artistic and precision elements of pattern flying.

Don Szczur

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Publishing input deadline is the 2nd Tuesday of the month. Please forward all inputs (Pictures in jpg format) to: Nic Burhans

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