

2022 PPC AirVenture Clinic Lesson Plan

Provide educational resources and opportunities to develop better, safer pilots.

Clinic Overview

Date: Wednesday, July 27, 2022 from 8:00 - 12:30 & Saturday, July 31, 2022 from 8:00 - 12:30

Clinic Title: Stick and Rudder Redux

Subtitle: The Fundamentals of Flight

Description: Stick and rudder skills are one of the very first things we learned (or did we) as pilots and yet a quick review of accident data suggests that a lack of these same basic flying skills are responsible for a disproportionate number of accidents. All flying comes back to the basics from that gusty crosswind short-field approach to a leisurely flight along the coast to the most extreme aerobatics. This clinic will get your feet moving by taking a refreshed look at some basic flight maneuvers, controlled and coordinated flight, and how to get that kinesthetic feeling back for flight.

Morning Schedule

Daily Schedule	AM	Duration
Check/Breakfast	07:30	30
Keynote	08:00	
	08:45	45
	Break	5
Breakout 1	08:50	
	09:35	45
	Break	5
Breakout 2	09:40	
	10:25	45
	Break	5
Breakout 3	10:30	
Flight Simulation	11:15	45
Debriefing	11:20	
Check Out	12:00	40

Clinic Objectives: Basic aircraft control skills are critical to flight safety. A lack of these skills continues to lead to accidents. Without proper training, many pilots will instinctively do the wrong thing when surprised by an unexpected event. Although some of the specific skills are model-specific, many are easily applied to most GA aircraft. Built into this clinic is the importance of proper training with a competent instructor and the need for regular practice.

Clinic Objectives:

- Explain the importance of acquiring and practicing basic stick & rudder skills using fun, scenario-based training.
- Develop safer pilots who instinctively know the energy state of the aircraft and are prepared to react appropriately when something unexpected occurs.
- Explain the importance of wing loading and angle of attack in achieving aircraft control.
- Suggest some drills and scenarios to help pilots achieve and maintain proficiency

About the Participants

- 66 total with 22 per Keynote and Breakout Sessions
- Private Pilot

Handouts for Participants

- Breakout Session slide decks
- Pilot Kits

Equipment:

- 11 Redbird LD Sims with a combination of glass and steam gauges
- 1 Redbird LD for CFI training

Keynote

- "Perpetual Learning and Practice"
- Presenter: Michael Goulian
- Facilitator: Jason Archer

Breakout Sessions

- "Back to Basics", Jason Archer
- "Total Control", Ken Wittekiend & TBD
- "Down the Cape", Volunteer CFI Staff

Debrief

- Presenters: Ken Wittekiend and Jason Archer
- 40 minutes

PPC Volunteer Qualifications: CFI with solid stick and rudder skills and knowledge

Wings Credit: See attached

Biographies:

Michael Goulian is a multi-disciplined aerial demonstration pilot. Beginning his career in the competitive world of aerobatics, Goulian earned the distinction of becoming one of the youngest pilots to ever win the United States Unlimited Aerobatic Championship at the age of 27.

His signature air show performance combines the heart-stopping gyroscopic tumbling of modern display flying with the crisp, aggressive, demands of precision competition aerobatics. In 2006, Goulian joined an elite group of pilots competing in the Red Bull Air Race World Championship. Competing as Team #99, Goulian and his team are engaged in a battle of technology, skill, and execution against 13 of the world's fiercest competitors.

Jason Archer is the Chief Flight Instructor at Berkshire Aviation, LLC (KGBR) and holds CFI-I, MEI,G, AGI, and IGI certificates and ratings. Flying since 1991, he specializes in tailwheel, primary and instrument training. He is a professional educator with over 20 years experience working in flight schools, planetariums, science centers and aviation museums. Jason holds a degree in Astrophysics and is currently the Planetarium Director for the Glastonbury Planetarium, a state-of-the-art facility, where he creates and delivers astronomy/aerospace content. When not flying he serves as the a Lead FAAS Team Rep presenting workshops throughout New England. He was the 2021 - 2022 AOPA Distinguished Flight Instructor, 2018 FAAS Team Rep of the Year BDL FSDO and the 2021 CFI of the Year BDL FSDO.

Ken Wittekiend is a professional aviation educator, writer and founder of ProMark Aviation Services, a full-service flight training company based in Burnet, Texas. He specializes in tailwheel, floatplane and Beech Bonanza training. He is a former Designated Pilot Examiner for the San Antonio Flight Standards District Office and has administered over 2500 practical tests. Ken serves as a FAAS Team representative for the Federal Aviation Administration, helping pilots by conducting seminars and counseling activities to reduce accidents and improve pilot safety practices.

In 2009 and again in 2015, Ken was selected as the Certificated Flight Instructor of the Year for the FAA Southwest Region. He is also an eight-time Master CFI. Ken is a charter member of the Society of Aviation and Flight Educators and formerly served on the SAFE Board of Directors. Ken teaches for both of the national Beechcraft Bonanza training organizations and has presented seminars at a variety of aviation events including AirVenture and Sun N Fun. Ken is also an avid back country pilot. In 2020, he flew his Cessna 182 Amphibious Floatplane from Texas to Alaska where he spent the summer exploring the remote regions of the Tongass National Forest. Ken currently writes a monthly column for Plane & Pilot magazine called "Wandering Skies". He is also working with Community Aviation to produce an on-line training course to help pilots better prepare for FAA Practical Tests.

Keynote

Title: "Perpetual Learning and Practice"

Description: Why is it that so many pilots lack the basic foundational skills needed to meet the challenges of common general aviation activities? Despite advances in aircraft technology we seem to keep experiencing the same "loss of control" events. We'll explore why stick and rudder skills are the key to make flying more enjoyable, safer and rewarding.

Objectives:

- Lack of focus on fundamental "Stick & Rudder" training. (Note: this may result in CFIs who themselves lack the requisite knowledge and skill to successfully teach these concepts)
- Lack of knowledge of basic aerodynamic concepts, flight control functions, energy management concepts which leads to a lack of ability to fly instinctively.
- Lack of regular practice on these essential skills
- Failure to make the training realistic by using appropriate scenarios. There is a lack of application and correlation of these skills to typical flight situations.
- Failure to carry the scenario to an appropriate conclusion such as a landing following a simulated engine failure.
- Failure to tailor the foundational training to specific aircraft models. Learning in a simple training aircraft may not be good enough when flying a high-performance model.

We believe that these foundational "Stick & Rudder" skills are:

- Critical to preventing LOC accidents and to making flying more enjoyable, safer, and rewarding.
- Learnable by typical GA pilots given appropriate instruction by qualified CFIs.
- Perishable unless the pilot commits to regular recurrent training and practice, particularly when changing aircraft models

Keynote Presenter: Michael Goulian

Agenda

<u>Topic</u>	<u>Presenter</u>	<u>Duration</u>
Welcome, Bathroom, Exits	Michael Goulian	5 mins
"Perpetual Learning and Practice"	Michael Goulian	35 minutes
Logistics	Jason Archer	5 minutes

Breakout Session 1

Title: "The Beginner's Mind"

Description: How to become a stick and rudder pilot? We'll step back and take a deep dive into the maneuvers, aerodynamic concepts and skills needed in straight and level flight, during turns, while climbing and descending and being coordinated vs. being un-coordinated. This breakout session will help you See flight with a beginner's mind.

Objectives: A practical review of basic maneuvers: 4-fund; steep turns, forward and slide slips; short-field techniques; practical aerodynamics; what is coordinated flight; how to fly straight and level; the beginner's mindset; seat of the pants; smooth coordinated flight; passenger comfort; happy passengers happy; safe airplane; critical for managing emergencies, & failures; important for higher level ratings; not just current but proficient/masterful.

Key Questions for the Learner:

- How would you explain the purpose of the flight controls to a non-pilot?
- What is the purpose of the rudder?
- What is your stall speed?
- What constitutes a stabilized approach?
- What is coordinated flight?
- If we stall the airplane while slipping or skidding, are we equally likely to spin?
- What does "unloading" mean and why do we care?
- What control turns the airplane?
- When would we use a slip?
- When slipping, is the airspeed indicator accurate?
- What is an indication that a pilot is not using enough right rudder during a normal takeoff?
- If we lost the airspeed indicator, how would we safely fly a visual approach and landing?
- When we trim the elevator, what are we trimming to? (Attitude, rate of climb or descent, altitude, airspeed, something else?)

Type of Presentation: PowerPoint with Interactive Discussion

Presenter: Jason Archer

Equipment: Whiteboard, Markers and AV for PowerPoint, Aircraft Models

Instructor Mindset:

- Lay the foundation for the lesson by reviewing key concepts.
- Facilitate deep thinking by posing questions rather than lecturing.
- Bring your unique style, techniques, and experiences to the lesson.

Participant Mindset:

- Be engaged and interactive.
- Visualize and simulate.
- Do the mental and physical work needed to answer the questions posed.

Breakout session 2

Title: "Total Control"

Description: The basics are the components and foundation for all of flight. Through a scenario based discussion we'll look at how and where stick and rudder skills apply in the operational environment.

Objectives: Applying S&R in everyday flying; S&R scenario discussion; can accidents can be eliminated with S&R?; Normal and abnormal operational parameters; provide the knowledge need to extrapolate the basics from known situations to unknown situations.

- To explore the reasons pilots and many others often react improperly when faced with an unexpected event.
- To present and discuss some scenarios where pilots get into trouble and fail to react properly.
- To emphasize the need for basic stick & rudder skills in developing proper instinctive reactions.
- To understand the need for G loading awareness, aircraft energy state and ways to control these.
- To present some drills and scenarios that can be used to improve basic skills.

Key Questions for the Learner:

- Why do pilots often do the wrong thing following an unexpected event such as an engine failure, inadvertent stall, wake turbulence encounter, etc?
- Is this failure to react properly unique to pilots or do others make the same mistakes?
- What are some examples of pilots doing both the wrong thing and the right thing?
- What are some of the common situations that lead to accidents due to a lack of basic aircraft handling skills?
- Why is an awareness of G loading so important to basic aircraft control?
- What exercises, drills and scenarios can be used to improve basic skills?

Presenter: Wednesday - Ken Wittekiend & Saturday - ??????????

Type of Presentation: PowerPoint with Interactive Discussion

Equipment: Whiteboard, Markers and AV for PowerPoint, Aircraft Models

Instructor Mindset:

- Lay the foundation for the lesson by reviewing key concepts.
- Facilitate deep thinking by posing questions rather than lecturing.
- Bring your unique style, techniques, and experiences to the lesson.

Participant Mindset:

- Be engaged and interactive.
- Visualize and simulate.
- Do the mental and physical work needed to answer the questions posed.

Breakout Session 3: Flight Scenario(s)

Special note: Please do not discuss, reference, or allude to specifics about the “Down the Cape” scenario. The goal is to see if participants can correlate and apply prior knowledge and experience to an unknown/unfamiliar scenario.

Title: "Down the Cape"

Description: Your friend just purchased a house out in Woods Hole, MA and has invited you and your family for a visit over the long Memorial Day weekend. You're based at KBED about 62 miles to the North. A nice but typical spring day of variable winds with the occasional gust is on deck for your flight out. Your plan is to meet him at Falmouth Airpark (5B6). Your flying doesn't end just yet. You'll depart Falmouth for a sight seeing flight with your friend for a photo mission of the new home and if you are lucky some whale spotting just off the coast. You'll return to Falmouth for a weekend of family fun. Don't let the apparent simplicity of this flight make you complacent. Stick and rudder skills are needed even on the most simplest of missions. This mission is broken into two parts - the Arrival and the Departure.

Part 1 - "The Arrival"

Mission Summary: A good friend of yours just purchased a house out in Woods Hole, MA and has invited you and your family (spouse and one child, 12) for a visit over the long Memorial Day weekend. You're based at KBED about 62 miles to the North. It's a nice, typical spring day with variable winds and the occasional gust. Your plan is to meet him at Falmouth Airpark (5B6).

Your VFR route from KBED to 5B6 included a salute to the pilgrims by flying over Plymouth Rock. You've continued your flight down the coast and are now presently located 12.5 miles north of the Cape Cod Coast Guard Station. You've been monitoring Boston on 118.2 but have not requested flight following and are squawking 1200.

Objective: The pilot has a decision to make at the origination point. There is a restricted area(s) ahead and it's hot and then there is the Class D airspace at KFMH. The PIC can proceed east or west around the restricted area(s) and then around, through or over the Coast Guard Air Station's airspace. It is the PICs choice.

Upon arrival at Falmouth Airpark the pilot will need to expect a right hand pattern for Rwy 7 and winds that slightly favor Rwy 25. There is no weather reporting at 5B6 so they will have had to obtain the ATIS from KFMH. There are also some tall trees at the end of Rwy 25 that should make it a sporty landing with the 10 KT crosswind. Some stick & rudder skills will come in handy here.

Duration: 10 minutes

Starting Conditions:

- Enroute to 5B6 from KBED via Plymouth Rock.
- 41.87° / -70.59; Over Route 3 in Plymouth, MA about 12.5 north of KFMH.
- Heading 170°; Following Rt 3, the Plymouth highway.
- In air at _____, at 100 KIAS, cruise configuration.

Weather:

- KFMH 1555 20010 A2942 10SM SK SCT019 19/15
- Winds Aloft: @30 27020 & @60 28030

Lesson Overview: No matter which course the pilot chooses to fly after the mission origination there will be some excitement ahead. Going east of the Class D the PIC will encounter traffic over 2B1, visible only after the pilot has committed to an easterly route around the restricted area(s). This would force them to maneuver carefully around the Class D or to transition the airspace. If they go over the Class D and unless the pilot is monitoring ATC (instructor guided) they will not be aware there is traffic (C130) departing Rwy 05/23 at KFMH. The airplane's departure direction will depend on the position of the subject aircraft. The scattered clouds will make the fast climbing cargo plane difficult to see until it's very close. Going west of the Class D, the PIC will encounter a C130 on final approach to runway 5 at KFMH. Once in the pattern at Falmouth there will be a plane departing Rwy 25 that will not require a go-around but some caution and vigilance.

Instructor Notes: "Down the Cape - The Arrival" upon appearance is a very simple scenario. However, it is designed to focus the PIC on some stick and rudder basics with distractions. How coordinated are they in the 4 fundamentals, how well do they divide their attention, how well can they plan and how well can they deal with the unexpected and maintain positive control over their aircraft? Depending on their skill, feel free to throw in instrument and/or engine issues into the mix.

Prior to the scenario starting, inform the PIC of their location and planned flight to 5B6. From here the PIC will have to make their own decisions regarding how to get to 5B6. Encourage them to treat this like a real flight with regard to radio communications, etc. You the instructor will play ATC if needed.

They have four possible entry options as follows:

Western Route Around Cape Cod Coast Guard Air Station

This is the longer route. All the PIC has to do is avoid the Class D and the R-4101 A, B, C airspace. Do they know the dimension of the D? And do they know what the Class E Extension areas are? As they come around the western side of the Class D, towards the Class E Extension area for the RNAV 5 around, there will be a C130 on the RNAV 5 Circle for Rwy 23. See attached for the RNAV 3 approach plate. The FAF is located at 1800' MSL in the middle of the Class E extension. Is the PIC monitoring either Boston Approach on 128.75 and/or KFMH CT on 126.425 for traffic awareness? If they've listened to the ATIS at KFMH, they would know that the winds are out of the southwest at 20010 so they may not expect an aircraft to be on a circling approach.

Between the Deltas Route

Flying between the two Class Ds is an option. But if the PIC simply follows the coast and using GPS turns South for a route between the Ds, the PIC should clear R-4101 A, B, C. This route is a tight fit with only about 2.2 nm between the two Ds so careful maneuvering and situational awareness is needed.

The PIC will have to be vigilant of glider and parachute operations at 2B1 because as they continue between the Ds a blimp over 2B1 will appear. This would force them to maneuver carefully around the Class D or to transition the airspace. From here they continue south with a right turn around the D to land at 5B6.

Over the Top Route

The Air Station Class D extends up to 26' MSL. The PIC may elect to fly over the D on a more direct route. Unless the pilot is monitoring ATC (instructor guided) they will not be aware there is traffic (C130) departing Rwy 05/23 at KFMH. The airplane's departure direction will depend on the position of the subject aircraft. The scattered clouds will make the fast climbing cargo plane difficult to see until it's very close. The PIC will need to have their head up and eyes out to see the traffic and make the appropriate course adjustments.

Through the D Route

It is always best to have a second set of eyes and be talking to someone. If the PIC elects to transition the Air Station Class D then you will play ATC. The PIC should contact Air Station Class D on 128.425 and request transition at XYZ altitude to Falmouth. Feel free to assign altitude and headings to the PIC as they transition south towards 5B6. Clear the PIC for a frequency change a few nm south of KFMH.

Landing at 5B6

As there is no weather reporting at 5B6, the PIC will have to get the weather via KFMH ATIS. Or they may try to fly over the field to look for the wind socks to determine landing direction. The winds are favoring Rwy 25.

Ideally, the PIC should either make a direct downwind entry or a 45° to the downwind entry for runway 25. The combination of the Class D just to the North and short runway may be a distraction. The approach for Rwy 25 at 5B6 is challenging. Rwy 25 is only 2298' x 40' with tall trees on the approach end. While the winds are a moderate 10 kts., the PIC will still need to be on "speed and on spot" for a short-field approach. Also, once in the pattern at Falmouth there will be a plane departing Rwy 25 that will not require a go-around but some caution and vigilance. If a go-around is needed, make sure the PIC follows the correct procedures.

If the PIC elects to land on Rwy 7 they will have a tailwind. This runway is right traffic with the Class D tight to the North. In most GA aircraft, landing distance is increased by 10% for every 2 knots of tailwind. That means if you have a 10 knot tailwind, you're facing a 50% increase in landing distance. If the PIC elects to continue, the PIC will not have enough runway to stop safely.

Training Elements:

- Have the pilot make non-towered radio calls on CTAF to add realism and a source of distraction.
- Let the PIC make their own decision as to the route they take. This will determine whether you need to play ATC.
- See if the PIC sets radios to CTAF 123.075, Boston Center 118.2, and KFMH 128.425.
- The PIC should comply with the 1000' TBA for 5B6.
- Talk about during VMC that the PIC should be 75-80% of time looking outside, 20-25% spent scanning instruments.
- Review traffic pattern entry procedures. Reference AC 90-66B.
- Review short-field landing speeds and configuration.
- Being continuously in the mindset for a go-around.
- Awareness that some aircraft may be in the vicinity but not in communication.
- Have the PIC perform some coordinated rolls to get the feel for the Redbird.

Common Errors:

Straight and Level

- Attempting to use improper reference points on the airplane to establish attitude.
- Attempting to establish or correct airplane attitude using flight instruments rather than outside visual reference.
- Attempting to maintain direction using only rudder control.
- Habitually flying with one wing low.
- "Chasing" the flight instruments rather than adhering to the principles of attitude flying.
- Improper scanning and/or devoting insufficient time to outside visual reference. (Head in the cockpit.)
- Failure to make timely and measured control inputs when deviations from straight-and-level flight are detected.
- Using trim as a substitute for control.

Turns

- Attempting to execute the turn solely by instrument reference.
- Lack of coordinated rudder/aileron into and out of a turn.
- Fixating on the nose reference while excluding wingtip reference.
- "Ground shyness"—making "flat turns" (skidding) while operating at low altitudes in a conscious or subconscious effort to avoid banking close to the ground.
- Holding rudder in the turn.
- Gaining proficiency in turns in only one direction (usually the left).
- Failure to coordinate the use of throttle with other controls.
- Altitude gain/loss during the turn.

Traffic Pattern

- Failure to properly use the appropriate checklist.
- Failure to configure the aircraft for landing.
- Wrong traffic pattern entry procedures.
- Flying incorrect traffic pattern direction.
- Not visualizing the traffic pattern.
- Failure to make appropriate radio calls.
- Poor situational awareness of airspace and entry procedures.

- Overshooting or undershooting the turn onto final approach resulting in too steep or too shallow a turn onto final approach.
- Flat or skidding turns from base leg to final approach as a result of overshooting / inadequate wind drift correction.
- Failure to complete the landing checklist in a timely manner.

Short-field Landing/Crosswind Landing

- Failure to allow enough room on final to set up the approach, necessitating an overly steep approach and high sink rate.
- Undue delay in initiating glide path corrections.
- Too low an airspeed on final resulting in inability to flare properly and landing hard.
- Too high an airspeed resulting in floating on round out.
- Prematurely reducing power to idle on round out resulting in hard landing.
- Touchdown with excessive airspeed.
- Failure to maintain directional control.
- Un-stabilized approach.
- Failure to adequately compensate for flap extension poor trim technique on final approach.
- Attempting to maintain altitude or reach the runway using elevator alone.
- Focusing too close to the airplane resulting in a too high round out.
- Focusing too far from the airplane resulting in a too low round out.
- Touching down prior to attaining proper landing attitude.
- Failure to hold sufficient back-elevator pressure after touchdown.

Part 2 - "The Departure"

Mission Summary: Your flying doesn't end just yet. You'll depart Falmouth (5B6) after lunch for a sight-seeing flight with your friend for a photo mission of the new home and if you are lucky some whale spotting just off the coast. You'll return to Falmouth for a weekend of family fun. Don't let the apparent simplicity of this flight make you complacent. Stick and rudder skills are needed even on the most simplest of missions.

Objective: The PIC will depart runway 25 for a short whale spotting mission. The whale spotting opportunity has turned into another photo opportunity. The pilot's friend's parents are leaving on a weeklong cruise down the east coast and the boat is clearly visible near Wood Hole. Your friend is encouraging the PIC to circle and then fly slow along the boat in a low pattern so he can try to spot his mom and dad on the top deck. He's got his camera in hand.

The pilot will encounter very different weather upon his return to Falmouth. Winds will have changed requiring a different landing direction and pattern management for runway traffic Rwy 7. While on short-final for runway 7 another aircraft (that has not been communicating on CTAF) will be spotted on short-final for the opposing runway 25 hopefully forcing the PIC to take evasive action. The PIC will then return for a crosswind landing.

Duration: 15 - 20 minutes

Starting Conditions:

Departure end of Rwy 25 at Falmouth.

Cruise ship placement at 41.5°/-70.66° heading NE at 05 KTS.

Return to 5B6 Conditions:

Another aircraft on a low short-final (almost at touchdown) for runway 25 as the PIC is on short-final runway 7 forcing the PIC to take evasive action.

Starting Weather:

At Departure from 5B6: KFMH 1555 20010 A3000 10SM SK SCT019 21/15 & Winds Aloft: 30 22020 & 60 20030

Return Weather:

At Return to 5B6: KFMH 1775 15010G18 A2942 7SM SK BKN050 18/13

Weather has changed since the departure. Winds are now favoring Runway 7 but with a crosswind out of the southeast.

- Landing Runway 7 results on a Tailwind on base & right traffic
- Landing Runway 25 results in a left quartering tailwind on final

Clouds have transitioned from SCT019 to BKN050. Temperature has dropped slightly and the altimeter has dropped to 2985 so it's important that the pilot checks the ATIS at KFMH.

Instructor Notes: Again, this is a seemingly simple mission. The PIC will be positioned on the departure end of Rwy 25 at 5B6. Given the short runway length and obstacles at the end the PIC should plan and configure for a short-field take-off. Let the PIC decide what to do.

After departure, the PIC will head south-west towards Woods Hole. As this is a sight-seeing trip have them climb to about 1500' MSL. Set pitch, set power and trim to hold altitude. Enroute they will see a cruise ship off the coast. Tell them to head towards the cruise ship for a few turns around a point. As their passengers are seated on the right side of the aircraft, the PIC will do the turns around a point to the right in addition to the left. Have them do both. The PIC can do as many turns around a point as they like. Options include having the PIC perform the maneuver with 10° and 20° of flaps at a slower speed. How well can they perform the maneuvering at different speeds and configurations? Once a few turns are completed, see how slow the PIC can fly along the cruise ship so the passengers can wave good bye to their parents on the ship. Have the PIC transition to slow flight. You might also fail their airspeed and/or altimeter. Can they hold altitude via visual references only? Let's find out. CloudAhoy will record how well they hold altitude, speed and the quality of their circle. Altitude should be at 700' - 1000' AGL for these maneuvers.

After the completing their sight seeing adventure it's time to return to 5B6. The weather has changed since the departure. Winds are now favoring Runway 7 but with a crosswind out of the southeast. As a result landing Runway 7 results with a tailwind on base & right traffic. While landing Runway 25 results in a left quartering tailwind on final. The clouds have transitioned from SCT019 to BKN050. Temperature has dropped slightly and the altimeter has dropped to 2985 so it's important that the pilot checks the ATIS at KFMH. Let the PIC make the call as to which runway to use but encourage them to use runway 7 if possible.

Landing on runway 7 requires right traffic with a tailwind on base and a crosswind from the south on final. Watch the PIC to see if they overshoot final on the base to final turn. If they overshoot too much do they execute a go-around or do they try to re-intercept the extended final? How coordinated are they?

Once on final they need to be on-speed and on-spot. Energy management is key here. With a stiff crosswind from the south (to their right) they should set up for a crab. Obstacles and a short runway might require a higher than normal approach glide slope with a possible forward slip to landing. Are they managing their speed?

While on short-final for runway 7 another aircraft (that has not been communicating on CTAF) will be spotted on short-final for the opposing runway 25 hopefully forcing the PIC to take evasive action. The PIC should execute a go-around. They should pitch up, power up, and clean up. See how well they manage transitioning from low energy state to a coordinated Vx climb. The PIC will then return for their crosswind landing.

Back over the numbers, the PIC should transition to a side-slip pointing the nose with their feet and holding centerline with ailerons. If touchdown doesn't occur in the first 1/3 of the runway they should execute a go-around.

Training Elements:

- Anticipating the wind effect on base-to-final turn
- The potential for a stall/spin loss of control
- Establishing a slip or crab to track centerline on final
- Flying to an aim point
- Managing pitch and power to be on-speed and on-spot
- Awareness of the runway centerline during the flare, touchdown and rollout
- Maintaining coordination throughout the turns around a point
- Holding altitude during a turn around a point
- Briefing for departure. This should be a verbal "what-if".
- Follow short-field take off procedures.
- Determining a point prior to runway entry; 50%/70% rule

Common Errors:

Short-field Take Off

- Failure to utilize all the available runway
- Failure to have the airplane properly trimmed prior to take off
- Premature lift off resulting in high drag
- Holding the airplane on the ground unnecessarily with excessive forward-elevator pressure.
- Inadequate rotation resulting in excessive speed after lift-off
- Inability to attain/maintain best angle of climb airspeed.
- Fixation on the airspeed indicator during initial climb.
- Premature retraction of wing flaps.

Turns Around a Point

- Failure to establish proper altitude prior to entry.
- Failure to establish appropriate wind correction angle resulting in drift.
- Gaining or losing altitude.

- Poor coordination. (Typically skidding in turns from a downwind heading and slipping in turns from an upwind heading.)
- Inability to adequately divide attention between airplane control and maintaining ground track.
- Improper timing in beginning and recovering from turns.
- Inadequate visual lookout for other aircraft.

Slow Flight

- Inadequate back-elevator pressure as power is reduced, resulting in altitude loss.
- Excessive back-elevator pressure as power is reduced, resulting in a climb, followed by a rapid reduction in airspeed and "mushing."
- Inadequate compensation for adverse yaw during turns.
- Fixation on the airspeed indicator.
- Failure to anticipate changes in lift as flaps are extended or retracted.
- Inadequate power management.
- Inability to adequately divide attention between airplane control and orientation.

Short-field Landing/Crosswind Landing

- Failure to allow enough room on final to set up the approach, necessitating an overly steep approach and high sink rate.
- Undue delay in initiating glide path corrections.
- Too low an airspeed on final resulting in inability to flare properly and landing hard.
- Too high an airspeed resulting in floating on round out.
- Prematurely reducing power to idle on round out resulting in hard landing.
- Touchdown with excessive airspeed.
- Failure to maintain directional control.
- Un-stabilized approach.
- Failure to adequately compensate for flap extension poor trim technique on final approach.
- Attempting to maintain altitude or reach the runway using elevator alone.
- Focusing too close to the airplane resulting in a too high round out.
- Focusing too far from the airplane resulting in a too low round out.
- Touching down prior to attaining proper landing attitude.
- Failure to hold sufficient back-elevator pressure after touchdown.

Go Arounds

- Failure to recognize a condition that warrants a rejected landing.
- Indecision.
- Delay in initiating a go-round.
- Failure to apply maximum allowable power in a timely manner.
- Abrupt power application.
- Improper pitch attitude.
- Failure to configure the airplane appropriately.
- Attempting to climb out of ground effect prematurely.
- Failure to adequately compensate for torque/P-factor.

Material and Equipment Needs

- Redbird LD
- CFI tablet computer

Instructor Mindset

- Give them a few minutes to just get comfortable with the “feel” of the Redbird.
- Watch how coordinated they are on the flight controls and use of trim.
- Let the pilot make their own decisions as to routing, getting weather, altitudes and pattern entry at Falmouth.
- If Participant is doing well, fail the airspeed and/or altimeter. You could also fail the radio via alternator failure.
- Instructor acts as ATC and informs pilot of traffic if the PIC elects to talk to ATC

Participant Mindset

- The sim flies different then the airplane you fly. Focus on learning how to fly the simulator.
- Focus on the basics: pitch and power, 4 fundamentals.
- Divide your attention and plan ahead.

Debrief

Objectives: A post-clinic debrief that will tie together the keynote, breakout sessions and flight simulations.

Key Participant Take-aways:

- Recognizing when something “out of the ordinary” is happening. (Situational Awareness)
- Know the energy state of your airplane.
- Determining the appropriate course of action. (Knowledge)
- Performing the correct action to mitigate the problem. (Skill)

Leading Questions/Group Discussion Ideas:

- What does flying “instinctively” mean to you? Is it important in reducing or preventing common LOC accidents?
- Why do pilots and other humans often do the wrong thing when faced with an unexpected event?
- How can a pilot develop and maintain better stick & rudder skills?
- Does technology help or hinder the development of S&R skills?
- Was this clinic useful? Did you enjoy it?
- How can we make it better?

Stick & Rudder Exercises

- Steep Turns (45-60 degrees of bank)
- Slow Flight I.e. riding the buffet
- Coordinated Rolls
- Turns Around a Point
- Lazy 8s
- Shapes with Rudder
- Low Speed Record
- Dutch Rolls
- Transitioning from a crab to a slip & back again
- Flight without Instruments

Presenters: Wednesday - Ken Wittekiend & Jason Archer
Saturday - Jason Archer & ?????

List of Resources/Reference Materials:

5B6: Falmouth Airpark Airport Diagram

KFHM Airport Diagram

KHYA Airport Diagram

Redbird LD 172 POH

Crosswind Component Graph

RNAV (GPS) RWY 25 @ 5B6

RNAV (GPS) RWY 7 @ 5B6

Arial View of Falmouth Airpark

Sectional View

List of Stick & Rudder Exercises

5B6 A/FD

Reference AC 90-66B

Notes:

- Adverse Yaw - Dutch Rolls - yaw dampers = your feet
- High Angle of Attack
- G-Loading
- Left Turning Tendencies
- Turning with just Rudder
- The Turn Coordinator - "call the ball"
- Rudder into and out of the turn i.e. 90 degree traffic avoidance
- Feeling Coordination
- What does being coordinated mean? Efficient, wings "see/feel" the same airflow
- Situational awareness is not about the map in front of your eyes, it's about the moving map inside your head
- Better automation does not stop CFIT, stall/spin, weather, and takeoff or landing accidents.
- Flying requires you to manage the energy state of a large chunk of metal hurling through the air while maintaining situational awareness, staying ahead of the aircraft mentally, and adjusting for countless variables ranging from weather to traffic to equipment failures to controllers, often all at the same time.
- Present some lack of Stick and Rudder accidents
- What does the rudder do?
- Slipping climbing turns after take off
- Descending left hand turn base to final
- Step on the ball, step on the cheeks...coordinated flight is between the cheeks
- "Better to be a teacher and/or a learner than an example" Robert Cohn

Where does a lack of basic "S&R" skill get us into trouble?

- Loss of control on takeoff, particularly in crosswind conditions
- Go-around maneuvers
- Engine failures, particularly during takeoff
- Wake turbulence encounters
- Low altitude maneuvering in the traffic pattern, during sight-seeing flight, and slow flight operations
- High density altitude operations, mountain flying
- Speed control on final
- Tailwind landings
- Basic aircraft control skills are critical to flight safety and a lack of skills continue to lead to accidents
- Without proper training, most pilots will instinctively do the wrong thing when surprised by an unexpected event.
- "Stick & Rudder" skills can be learned in a fun, scenario-based training course
- These skills are perishable and must be practiced regularly
- Often these skills are somewhat "model-specific" and should be tailored.
- The result of this training is a safer pilot who can fly instinctively, knowing the energy state of the aircraft at all times and who is prepared to react appropriately when something unusual happens.
- An understanding of wing loading and angle of attack

- Understanding your limitations and your skillsets and how to push beyond them with support
- Practice - Practice - Practice
- To fly and train with humility