



Aerobatics

International Aerobatics Club, Chapter 12
aka

“Rocky Mountain Aerobatics Club”



Topics



- Who are we?
- Why fly aerobatics?
- Ways to be involved
- Safety
- Regulations
- Aerobatic Aircraft
- Competition
- Cockpit Video
- Getting Started



About IAC Chapter 12



- IAC is a Division of EAA
- IAC Chapter 12 = Rocky Mountain Aerobatic Club
 - About 80 members primarily along the Front Range
 - Wide variety of backgrounds & experience levels



Why Fly Aerobatics?



- Challenging
- Exciting
- Rewarding
- Skill building & safety
- Camaraderie
- Inspiring
- Congenital Vitamin G Deficiency





Ways to Be Involved



- Increase skills with qualified CFI
 - Unusual attitude & spin recovery
 - Basic maneuvers: loops, rolls and spins
- Recreational
 - At your own goals and pace
- Airshows
 - Definitely **not** for everyone!
- Competition – it's a blast



Safety & Accidents



- Airshow vs. Individual vs. Competition
- Common Causes
 - Poor judgment
 - Showing off / spontaneous / unplanned maneuvers
 - Lack of training
 - Insufficient altitude
 - Inappropriate aircraft
 - Fuel mismanagement
 - Physiological problems (rare)
 - Structural or control failure
 - Very rare in aircraft designed for acro



Regulations



- FAR 91.303: Aerobatic flight is not permitted...
 - Over congested areas & open air assemblies
 - Within Class B, C, D, or E airspace (below is OK!)
 - Within 4nm of centerline of airways
 - Below 1500 AGL
 - Visibility less than 3sm
 - FSDO issues waivers for contests & practice areas
- How does the FAA define aerobatic flight?
 - “Intentional maneuver involving an abrupt change in an aircraft's attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight.”
 - Pretty vague, right? What would an FAA lawyer say?
- FAR 91.307(c): Parachutes
 - Required if bank exceeds 60° or pitch exceeds 30° (exceptions for spin training & check rides) **and** more than one person on board
 - Required at all IAC events
- POH limitations



Typical Aircraft



- Approved for at least +6, -3Gs
- High power-to-weight ratios
 - “Low Frills”
- Symmetrical airfoils
- Inverted fuel and oil systems
- Predictable stall, spin and recovery
- Phenomenal control authority, neutral stability
- Monster seat belts



Eye Candy

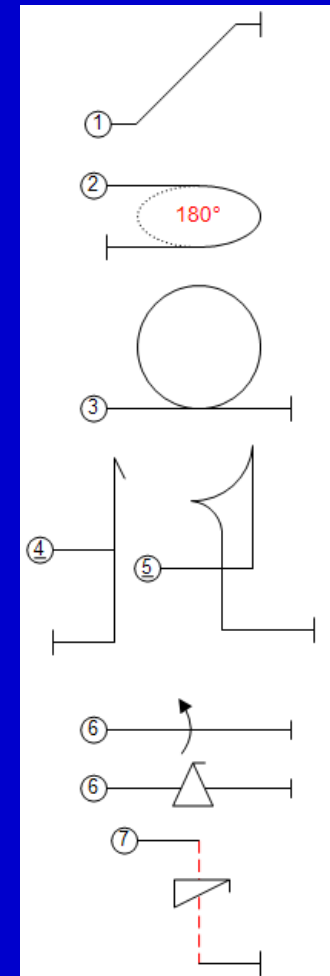




Maneuver Elements



1. Lines: Horizontal, 45°, Vertical
 2. Turns & Rolling Turns
 3. Loops & Partial Loops
 4. Hammerheads
 5. Tailslides
 6. Rolls: Aileron and Snap
 7. Spins
- Gyroscopics





Competitive Aerobatics

Measuring Against Perfection



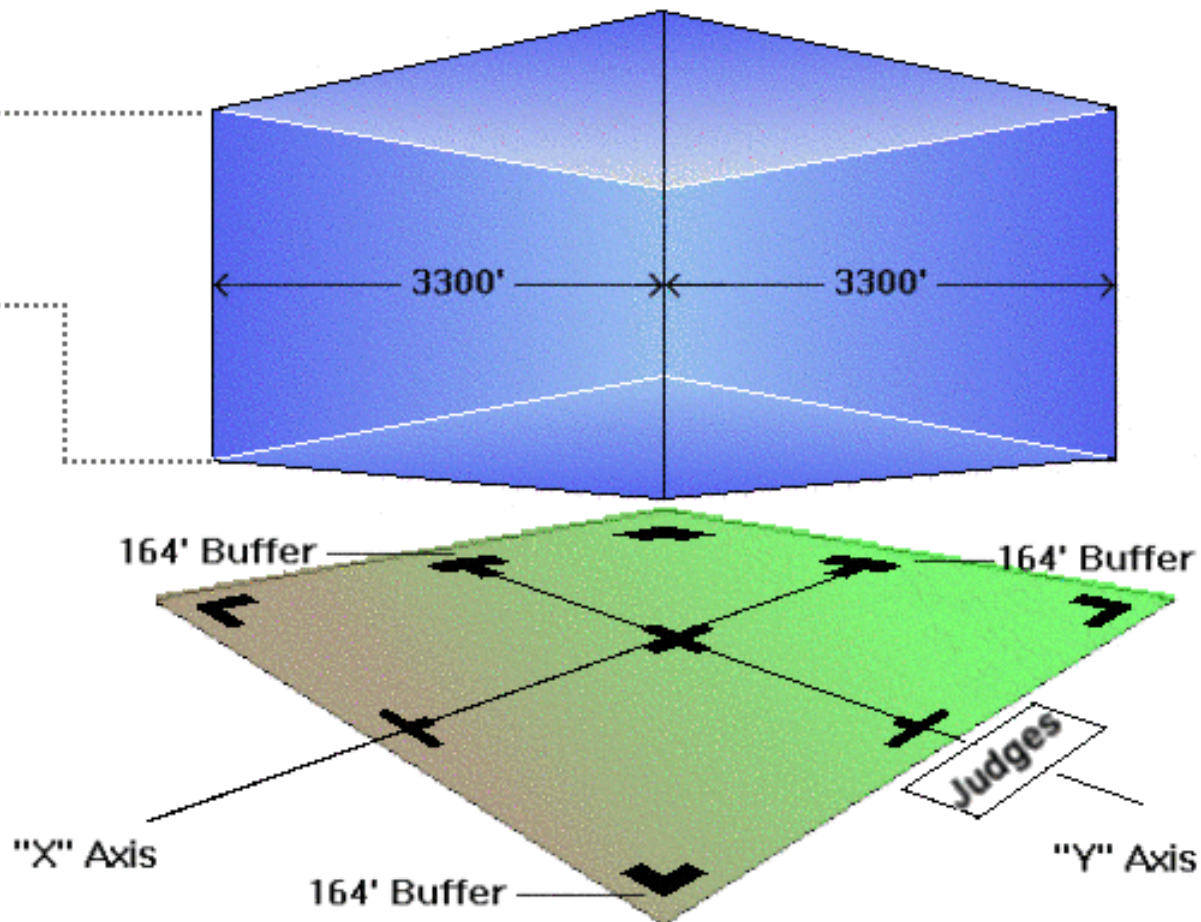
The Aerobatic "BOX"



The Aerobatic Zone

UPPER LIMITS.....
3280' AGL Unlimited
3500' AGL All Others

LOWER LIMITS.....
1500' AGL Basic & Sportsman
1200' AGL Intermediate
800' AGL Advanced
328' AGL Unlimited





Scoring



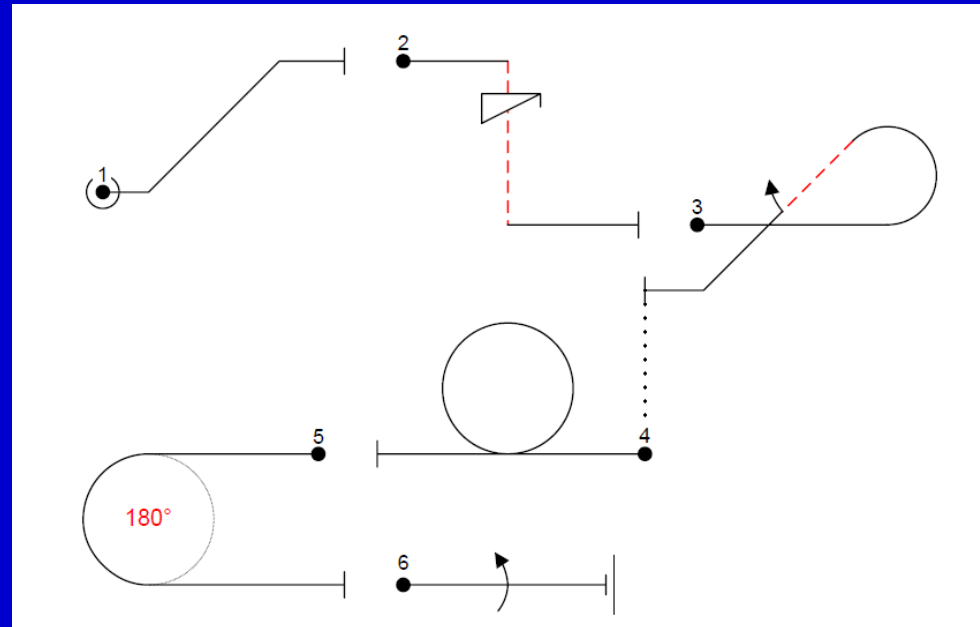
- Much like figure skating, pilots fly a routine that is scored by a panel of judges
- Each figure is compared with ideal geometry, and assigned a score from 10 to 0
- Each figure has a “K factor” reflecting difficulty
- Presentation is also graded
- Other Deductions
 - Boundary infringements
 - Interruptions
 - Low calls



Categories



- Primary, aka Basic
 - Known sequence is flown three times
 - Citabria, C152 Aerobat, Clip-wing J3, RV series

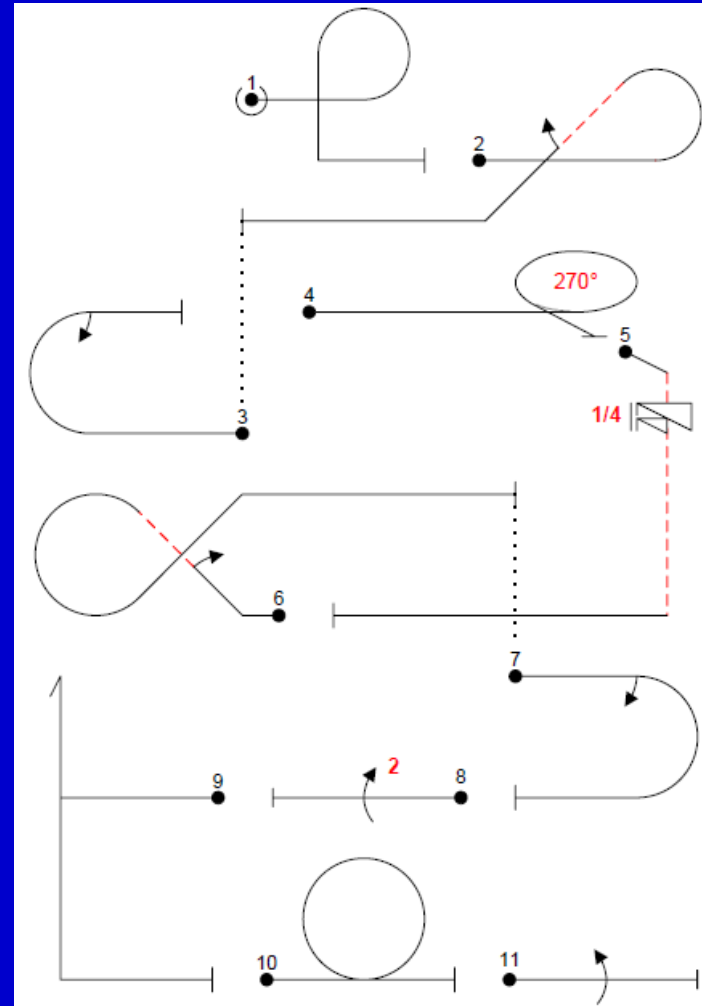




Categories



- Sportsman
 - Known sequence is flown three times, optional freestyle
 - Introduces hammerheads
 - Citabria, Decathlon, Chipmunk, RV series

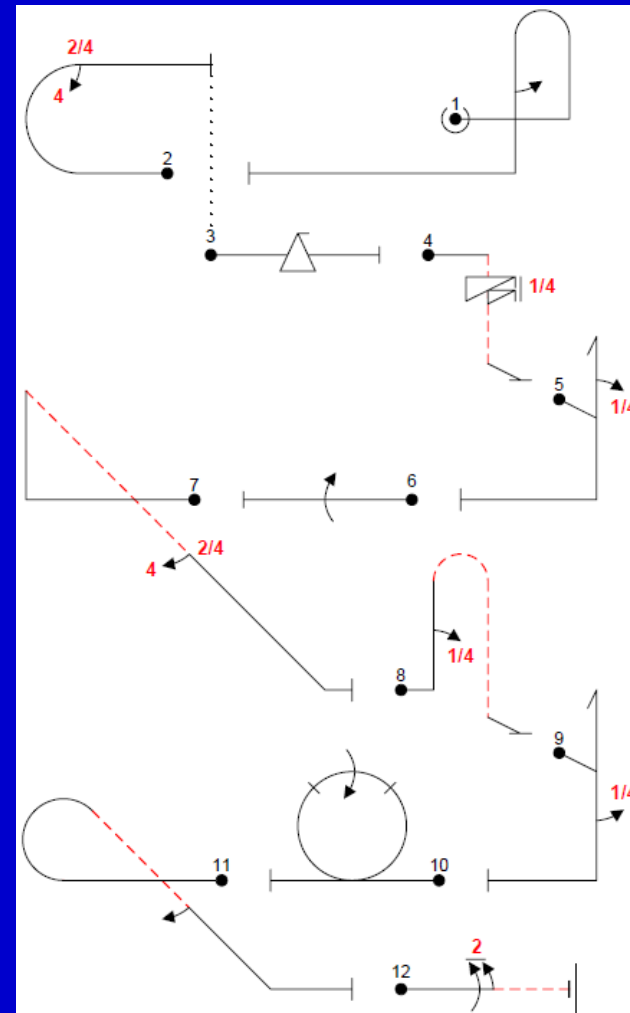




Categories



- Intermediate
 - Three sequences:
 - Known
 - Free
 - Unknown
 - Introduces snap rolls, limited -G maneuvers
 - Pitts, Eagle, Yak55, 450hp Stearman

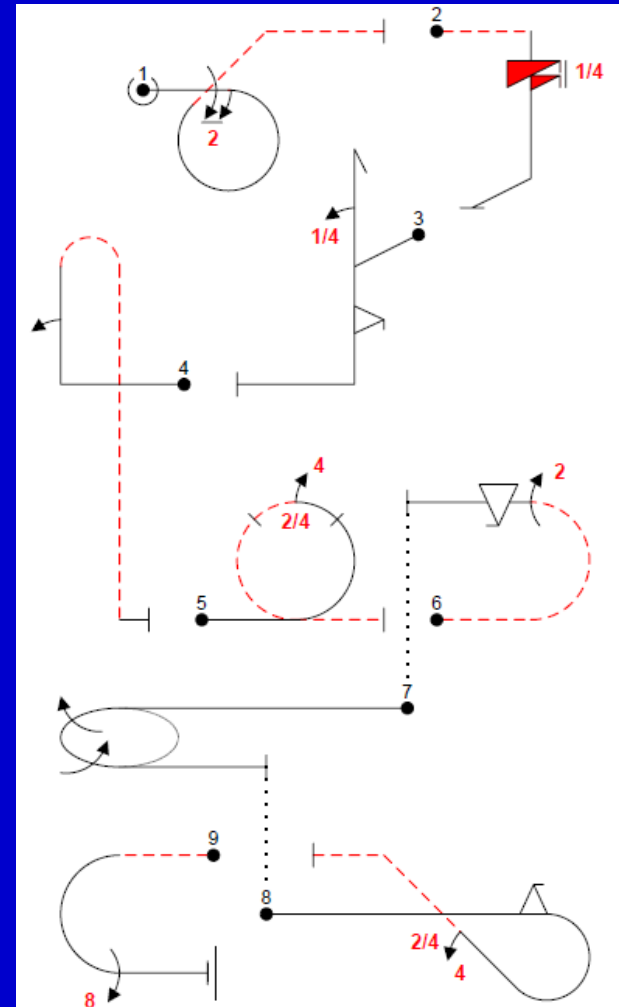




Categories



- Advanced
 - Known, Free, and Unknown sequences
 - Introduces rolling turns; many -G maneuvers
 - Pitts, Extra, Zlin 50, Yak-55, One Design, G-202



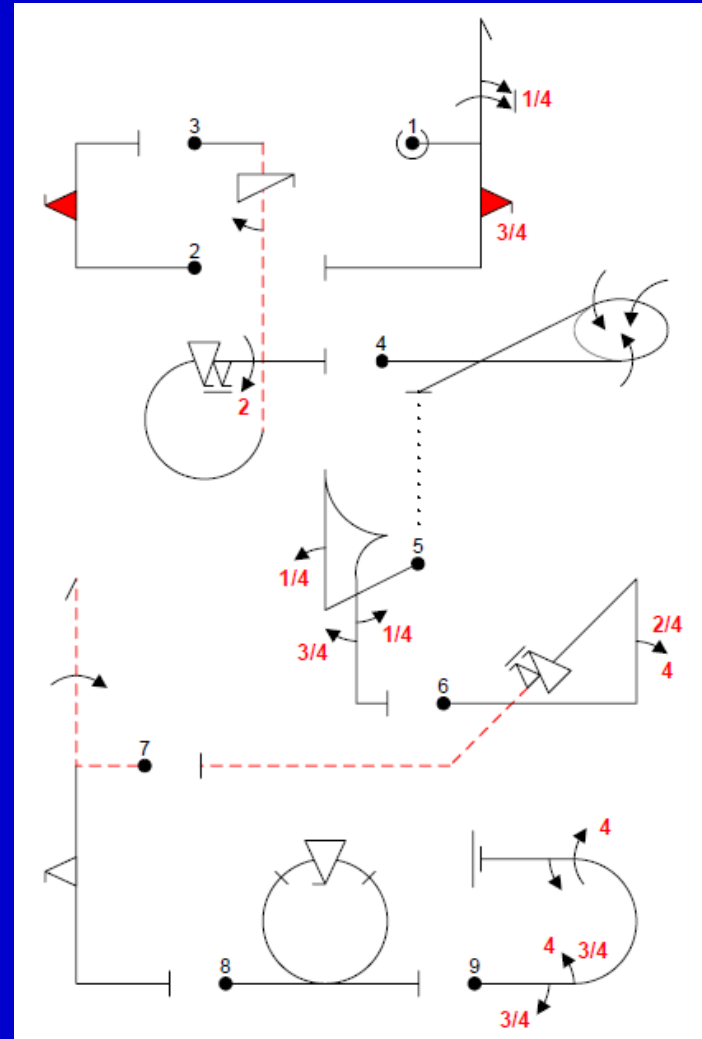


Categories



- Unlimited
 - Known, Freestyle, Unknown sequences
 - Introduces negative snaps, tailslides. Very complex sequences.
 - Extra 300L*, Sukhoi, Edge, G-200

* - At sea level!





Contests



- 35 U.S. Regional Contests in 2007
 - Three events per year in Colorado
 - Mostly in Spring/Summer
 - Regional Awards based on points
- US National Aerobatic Championships
 - September in Sherman/Denison, Texas
 - 80 to 100 competitors
- World Championships (Advanced & Unlimited)
 - Biennial, recently held in Slovenia, Poland, Florida, Spain
 - National teams from 15 to 20 countries, 60 to 80 pilots total
 - 2008 AWAC in Pendleton OR, Aug. 1-10



Typical Regional Contest Format



- Friday
 - Contestants arrive, register, inspect airplanes and paperwork
 - Sign up for practice in the box
- Saturday
 - Pilot briefing: weather, procedures, safety, order of flight
 - Known sequence flown for all categories, some Freestyles
 - Dinner Banquet
- Sunday
 - Pilot briefing: review, fine-tune
 - Known sequences for Primary and Sportsman, Free programs finish, Unknown sequences flown
 - Awards ceremony



Contest Operations



- Contest Director
 - Volunteer Coordinator
 - Chief Judge + assistants
 - Line Judges + assistants and recorders
 - Boundary Judges
 - Registrar
 - Scorer
 - Box setup / teardown
- and more...



Cockpit Video



-
- Flying an Intermediate Known



Getting Started



- Local Instructors

- John Blum: New Attitude Aerobatics, BJC: Decathlon, Pitts S2B (www.flyaerobatics.com)
- Dick Bevington & Doedo Schipper: Air West, LMO: Citabria and Decathlon (www.airwestinc.net)
- Rene Minjares: Barnstormers Aero Services, APA: Pitts S-2C (www.basi.org)
- Tom Edwards, BDU: Decathlon, Eagle (teebird004@yahoo.com)

- Visit a contest

- www.iac12.org/contest_info



Add'l Resources



- People: Any RMAC officer or director
- Books:
 - “Basic Aerobatics” by Szurovy & Goulian (ISBN 0070629269)
 - “Better Aerobatics” by Alan Cassidy (ISBN 0954481402)
- On the Web:
 - IAC: www.iac.org
 - RMAC: www.iac12.org
 - Email lists: www.aerobaticsweb.org/iac_exploder.html
 - “How to Shop for Quality Aerobatic Training”:
www.richstowell.com/howto.htm



THANK YOU!