Sport Class Air Racing 2015

How to fly at 50 feet responsibly with 8 “uncooperative” airplanes
Safely Introduce Pylon Racing to Rookie Race Pilots
  * Ground School
  * Briefings
  * Working Area Practice
    * Formation Skill Development
    * Required Maneuvers Demonstration
    * On-Course Training and Practice

Hone Racing Skills of all Sport Class Race Pilots
  * All the above
  * Leadership Development
Establish Standard Operating Procedures for all Aspects of Sport Class Air Racing:

- Pre-Race Prep
- Briefing
- Ground Operations
- Flight Operations
  - Departure/Join-up
  - Area Training
- Starts
- Racing
- Recovery
- Abnormals and Emergencies
Sport Class PRS

Goals & Objectives

* Provide look-ahead training for NCAR Race Week Operations
* Provide Class guidance on preparations for NCAR
* Establish a Sport Class culture of:

SAFETY and RACING EXCELLENCE!

Revised March 2015
Primary Benefits of PRS

- Broaden your understanding of your airplane
- Hone your airplane handling skills
- Sharpen your Safety Focus
- Improve your Situational Awareness
- Learn the basics of Pylon Racing
Secondary Benefits

- Learn about yourself
  - Your tolerance to stress
  - Your ability to multi-task
  - Your ability to adapt to, and follow, SOP

- Enjoy the camaraderie of fellow aviators
  - Earn and share the TRUST of your fellow racers

- Oh yeah, and qualify to race in September

Revised March 2015
Presenters

* Bob Mills – President, Sport Class
  * Sport Class Instructor, Check Pilot, Pace Pilot
  * Formation Check Pilot, FAST and FFI
  * USN F-14 Tomcat, TA-4 Skyhawk
  * Captain—Southwest Airlines
  * RV-Super Six - “Rocket Six”

* Rick Vandam - Treasurer/Co-Founder Sport Class
  * Sport Class Instructor, Check Pilot, Pace Pilot
  * Formation Check Pilot, FAST
  * USAF, NevANG F-4 Phantom II
  * Captain – US Airways
  * Founder of Jet Class 2001
  * Glasair II – “Greenstreak”
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<th>Racers</th>
<th>Winning Speed</th>
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<td>396 MPH</td>
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Keys to Sport Class Success

- Balance on the interests of 3 constituents:
  - The Racers
  - The Spectators
  - The Race Organizers

- Constant Focus on Safety/Risk Reduction and Excellence
  - Make it our Culture
  - Take Care of Each Other
  - Have Fun!
Risk Reduction

* Identify hazardous conditions

* Standardization
  * Everyone doing the same thing the same way
  * Keeps people predictable
  * Aids everyone’s “Situational Awareness”

* People demonstrating poor airmanship or lack of discipline will not be tolerated in the class
Requirements to Participate

- Private License
- 500 Hours Fixed Wing PIC
- 10 Hours in Type
- 10 Take offs and Landings in Type within 90 days
  - 3 in actual race aircraft
- Class II medical issued within 6 mos of Race
  - 6 mos requirement n/a for PRS
- Formation Experience/Competence
  - Station-keeping, Echelon, Line-abreast, Turning Rejoins
Formation Competency

* Must meet one of the criteria below:

  * FAST/FFI card
  * Completion of formal formation training
  * Military or equivalent training
  * Completion of Sport Class Formation Clinic
Sport Class PRS
Syllabus Overview

- Tech requirements
- Ground Operations
- Flight Operations
- How to Qualify
- General Dos and Don’ts
How to start a race
  * Join-up/ Chute/ Starting Lap
* Rules and techniques around the Pylons
  * Fast line/ Passing
* Recovery and Landing
  * Cool Down/ Traffic pattern
* What to do if something goes wrong
* Simulated Emergencies/ Upset Recovery
Training Outline

1. PRS—Day One
   * Chronologically go through the day
2. PRS—Days Two and Three
3. RACE WEEK
4. SAFETY Concerns
Before you leave Stead for Hotel--Make sure:

- Tech inspection complete
- Windshield clean
- Fuel--Oil
- Pre-flight Complete
- Helmet/Gloves/Flight suit
- Cockpit items stowed
- All questions answered
- Ride/Show/Brief times are known!
Tech Inspection

* Performed by Sport Class Tech inspectors
* Checks compliance with Sport Class Rules
* Top cowl removed
* Wheel pants removed for brake inspection (FG Aircraft)
* Overall airworthiness items checked
* Equipment Check:
  * Flight Suit
  * Helmet
  * Gloves
  * Fire extinguisher
PRS
DAY ONE
Morning RARA brief in RARA hangar
- Last minute schedule changes plus weather
- No Brief—No Fly

Morning Sport Class Brief in ERA hangar
- Immediately following RARA brief
- Receive Flight Assignment/line-up card
- Flight is given Course time
- Flight Lead will brief the specifics of the Flight
* We will be assigned 2 time blocks as a Class. No Sport Class Airplane can take off to enter the course, or to enter the Queue until previous Class has landed.

* We divide our blocks into smaller units of times for flights. We can takeoff, go to the Queue, or land any time during our block. Aircraft can only be on the course during their specific assigned time.
Learning Objectives

- Continue Formation Warm-up
- Area Work/Maneuvers
- How to find and fly the Chute
- How to find and fly the Pylons
- How to enter and exit “Cool Down”
- How to fly a standard recovery
After Flight Brief
Spot Aircraft

- Find tow driver—offer bribe
- Spot At least 20 Minutes prior to Take-off
  - Lead Designates Spot and Start Times
- Meet for final brief at Lead’s airplane
- “No Prop Turn” line in effect
  - Do not taxi or coast across it!
No Prop Turn Line

RWY 8-26

Taxiway

No Prop Turn Line

Crew Only Line

Sport Class Hangar

Fuel
Engine Start

- Lead will check everyone in at briefed time
- Check in with Race number in order
- Start Engines
- When ready to taxi pull forward 5 feet

- BE VIGILENT ON THE RAMP!
*TAXI*

- Lead gets clearance for the group and leads the taxi
- Taxi Staggered
- Help out taildraggers
- Uniform spacing--Look professional
  - Airshow formation spacing not required
Run-up

- All Aircraft do Run-up on their own
  - No run-up signal required

- Pass Thumbs-up to Lead

- Lead switches flight to Race Control Frequency

- Check-In with Race number
Line-Up

* Lead taxis down runway to allow all members of the flight to stop on North (hot) side of the runway
* Angle 45 degrees to the runway heading
Takeoff

- Racers roll in order when previous racer is 1000 ft down the runway
  - Lead Call 60 knots

- Takeoff on Hot side, abort to Cold side

**THERE WILL LIKELY BE RACERS ALREADY ON THE COURSE**

- Low Transition on South Edge of Runway

- No turns until past the race course
Takeoff Aborts

- Aborting aircraft
  - Call Aborting
  - Move to Cold Side when under control and its clear to move
    - Call “cold” when moving to cold side

- Remaining aircraft continue on Hot Side
Hot Side / Cold Side

Hot Side

Cold Side
CAUTION

* Worth repeating----

* Racers are on the course
  * Do not wander North of the Runway!!!
Last plane off calls “Race 3 airborne”

Lead starts left turn and all racers begin a left turn as soon as they are past the race course.

CAUTION: There could be racers in the chute
Departures 8

Take Off Rwy 8
Departures 8

Turn with lead for cut-off
Departures 26

* Last plane off calls “Race 3 airborne”

* Fly runway heading until you are past the race course

* Make right 90 degree turn Northbound

* Lead will start left turn and all aircraft should immediately make left hand turn for cutoff

* Do not turn North early: RACERS ON COURSE

* Last few aircraft may cut across circle to West
Departures 8

Avoid Traffic on Race Course
Departures 8

Take Cut-off together
Trailers may head straight west
Area Work

* At Lead’s discretion, you may go to a working area before maneuvering to enter the course via the chute.

* Primary Drivers
  * Course Timing and Training Requirements

* Caution when crossing the T-6 hold area enroute to area.
T-6 Holding Procedures

- Announce: “Entering the Hold”
- T-6 Hold is Active during Practice and Qualifying
- House with outside storage
- Small Dirt Runway
- Enter Hold From East to West
- Holding Left Turns 7000 feet
- Exit Hold for Course
- Announce: “Leaving the Hold for.....”
- Exit Hold for Landing 28/12/14
- Exit Hold LDG 8
- Gravel Pit

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Area Work

* Close formation
  * Fingertip
  * Cross-under
  * Echelon/Echelon Turns

* Upset maneuver (Flip-Flop)
  * Roll to Inverted and Return to Upright
  * Recognize limitations of no inverted oil

* G demonstration
  * 4g “Windup”

* Wingtip Vortex Awareness

* Extended Trail (Optional)
All Rookies will enter the course for their first time by following lead down “The Chute” in echelon formation.

Begins behind Peavine Peak, heading North down the East boundary of the race course.

Bronze and Medallion Leads may fly inside (N) of Peavine.
Entering the Course

- Lead will maneuver the flight to “The Chute”
  - Loose Echelon, Relatively Slow Speed
  - So you can see course highlights and pylons
  - No Passing on Course Fam Hop 1

- Lead de-conflicts with aircraft on course/in Queue
  - On-Course Racers will exit via “Escape Maneuver”
  - Lead also de-conflicts with aircraft on takeoff roll on 8 or landing on 26

- Lead may hold flight higher than normal or enter Queue if conflict is not resolved
  - Leads will communicate with each other
Race Course Familiarization

- Lead will fly at a pre-briefed speed and provide a guided tour
- Highlights include:
  - Start Chute and associated landmarks
  - Lighted Start Pylon
  - Lighted Guide Pylon
  - Sport Gold/Unlimited Course Pylons (White)
  - Sport Course Pylons (Blue/White)
  - T-6 Course Pylons (Red) (only for racers with top speeds \( \leq 250 \) mph)
  - All Courses Share Pylons 7, 8, 9, Home and 1
- All Sport Class Starts will be via the Sport Chute
  - Bronze and Medallion will go inside (N) of Peavine when racing

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Lead will brief and fly the guided tour on appropriate course(s)
  - This Course Fam 1 hop is the ONLY hop on which course changing is allowed
  - Subsequent PRS hops will brief and fly on one course only for the period

Flight composition determines what courses will be demonstrated – Lead Discretion
  - Gold-only racers may elect to fly only the Sport Gold/Unlimited Course
  - > 250 mph racers will be guided on both Sport Gold/Unlimited and Sport Courses (2-4 laps per course after start lap, course time permitting)
  - < 250 mph racers will be guided on Sport Gold/Unlimited, Sport and T-6 Courses (2 laps per course after start lap, time permitting)

Course Fam 1 hop will conclude with a demo of escape maneuver and entry into cooldown for recovery
Sport Gold and Sport Course
Sport Medallion (T-6) Course
Race Course Familiarization

Start Lap features

* Lead will enter via the Chute and point out features and hazards:
  * Chute and Start Pylon relative to runways
  * Identifying Landmarks
    * Go-Kart Track
  * Lighted Start Pylon
  * Pylon 4 (first turn)
  * Each pylon in succession
  * Lighted Guide Pylon on west side of course

* Lead will brief & clearly communicate all course-to-course transitions

* For Flights Transitioning to the T-6 Course:
  * Trailer must call “clear of 7” before lead will transition to T-6 Course at Pylon 1
Sport Gold Course Features

- East Show Line not may not be visible until close
  - (white checked swath)

- Pylon 4 may not be visible initially, depending on altitude
  - Top of hill

- Lighted Guide Pylon
  - Between Pylon 6 and 7

- West Show Line is graded swath
* Lead will point out subtle rising terrain between Pylon 3 and 4

* Turn around 4, 5 and 6 requires planning/technique

* Lead will point out the western Guide Pylon
Sport Medallion Course Features

- On Start Lap Trailer must clear 7 before Lead merges at T-6 #5
  - Trailer must exit course if not clear
    - Should not be a factor in normal ops
    - (Requires 150+ mph speed advantage)

- Tighter Turns at T-6 Pylons #2 and #5

- Shorter Straightaways

- Passing will be very dynamic

- Potential to bust S show line in traffic
  - Use Escape Maneuver
On the Course

- Fast Line
  - Smooth, non-scalloped turns
  - Level
  - Minimum G
    - Sport Course, 2.2 is all you need
    - T-6 Course, perhaps a bit more
- Optimum Ground track changes with wind
- Plan the turns – Look at next two pylons
- Head on a swivel – Don’t fixate and lose SA
- Situational and Terrain Awareness are paramount
- Scan Engine
  - Find a spot on the course to check Oil, EGT, CHT
  - Check engine at least once each lap

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Hazards on course

- Turbulence
  - Different wind direction makes the course fly differently

- Rising Terrain between pylon 3 and 4
  - Difficult to see/focus is on planning for pylon 4

- Wing Tip Vortices/Prop Wash
  - Particularly bad behind Thunder Mustang
  - Wind changes location of vortex
7-10 Laps

* If you are on time for the Chute, flight will have an opportunity for 7-10 laps (depending on speed) before the next group arrives down the Chute

* Flight will exit out the ESCAPE ROUTE and up into COOL DOWN.

* Leads must communicate with each other
  * Wingmen must follow Lead’s direction and exit course as instructed
The Escape Maneuver

- Pitch up and climb to 1500’ AGL +
- Fly S of Airport, Stands, and Crowd
- DO NOT Buzz west-end hangars!

Used to exit course when:

- S show line bust inevitable
  - Even if forced... Exit and protest
- On-Course aircraft must clear with next group in the Chute
  - Caution for aircraft in chute
    - Give Chute Aircraft Right of Way
Exiting the Course

* Call off the course
  * “Race 3 is off course at 7”
  * “Race 3 is off course at Home”

* Climb to “Cool-Down” altitude above 7,000
  * Use Escape Route if Racers in the Chute

* Fly over the race course
  * Watch for traffic in “Queue” at 7,000
Exiting “Cool Down” to Land

- Do not stop flying!
- Manage the engine and systems!
- Switch brain to landing mode!
- Clear traffic in the Queue and Cool Down!
- Call “Race 3 Out of Cool Down”
- Fly proscribed procedures
Pattern for 26

Rwy 26 Landing
Leave Cool down here

Descend to 6000'
Pattern 26

Rwy 26 Landing

Report Downwind Abeam 6000'

National Guard Base
Pattern for 26

Rwy 26 Landing

Report Base Gear Down
Pattern for 8

Rwy 8 Landing

Leave Cool-down here to 6000'

National Guard Base
Pattern for 8

Rwy 8 Landing

Report # downwind Abeam

Report # Base/Gear

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Radio Calls

- “Race 3 Leaving Cool Down”
- “Race 3 Downwind abeam”
- “Race 3 Base / Gear”

*Use only Race #*
Landing

- Landing with Sport Aircraft still on roll-out is authorized
- Land on Hot Side, Check Brakes, Clear to Cold Side
- Do not turn off mid-field
  - RWY 8 Exit B
  - RWY 26 Exit C3
- Meet at Pace Plane / Lead Aircraft for debriefing
- Get Gas if required for next flight
Runway Exit Plan
Repeat of the Morning – Without Guided Tour
* Flight will now train on one course per period – Lead Discretion
  * Based on Wingmen Training Requirements

Expect Conflicts/Coordination when entering/exiting course
* Aircraft enter course directly from takeoff
* Aircraft enter course from Queue
* Aircraft enter course from Chute
* Off at Home, Off at 7 via the Escape Maneuver
  * May exit elsewhere, but caution for traffic in Queue

Listen up—maintain Situational Awareness

Develop Course Awareness and Techniques

Ask Leads and Experienced Racers for clarification and assistance
  * They might even tell you the truth! (But few secrets!)
Entering Course from Take-off

- Runway 08
  - Left turn at end of runway
  - Fly wide checking for traffic inside
  - Join course at Pylon 3

- Runway 26
  - Left turn to 1500 feet
  - Do Not Buzz West-end Hangars
  - Behind crowd
  - Join course at Pylon 3
Entering from Queue

- Queue is flown at 7000
- Clear traffic on course
- Radio Call “Race 3 Joining course at Pylon 3”
- Pylon 3 preferred, traffic permitting
- Enter Wide and Give Traffic On the Course R.O.W.
- Watch Your Speed!
Non “Chute” entries

* Entering Race Course either from takeoff or the Queue
  * DO NOT FLY AROUND THE START PYLON.
    * (Not applicable if you are flying the Gold course)

* Entry from the Queue to the T-6 Course
  * Between 2 and 5 (back stretch)
  * Control speed and enter wide

* Any course entry requires caution and traffic in sight
  * Work your way onto the course line slowly
  * Yield as needed
One of the key skills to acquire and develop at PRS

- Understanding the Flow of the events
  - How airplanes enter and exit
  - Where to look for airplanes
  - How airplanes fly the landing pattern
- Listening to the radio and interpreting
- Anticipating what will happen next
Flight Discipline

- **Essential to Safety**
  - Do what you say you are doing
  - Fulfill the formation “contract”
  - Remain predictable

- **Must be Standardized to avoid potential conflicts:**
  - Take-off with airplanes on course
  - Entering/Exiting the course
  - Landing Pattern/Chute/Cool Down

- **Must fly your plan**
PRS
Day Two and Three
Learning Objectives

* Integrate and Automate knowledge gained on Day One
  * Make it part of your Racing DNA

* Learn Passing techniques

* Demonstrate proper Simulated Emergency Landing procedures

* Demonstrate Upset recovery/Wing Vortex Knowledge
Final Objective

Pass Check Ride and
Earn Racing License
Format the same as Day One Plus:

* Simulated Emergencies
* Passing
* Check Rides
Simulated Emergencies

- Divide race course in thirds and decide a plan of action for each third of the runway.
  - Or Use The Vandam Clock Method
- Remain flexible—winds change everything
- Zoom climb inside race course to best glide speed
  - Initially climb towards course apex
  - Manage Airspeed and Emergency
  - Select Runway
- Call “Race 3 Simulated Engine Out”
  - Race Control will call winds
  - YOU select and communicate runway
    - Comm if able... but crash crew responds to your call!
Simulated Emergencies

- Aim for 1/3 of the way down the runway
  - Do not attempt against traffic
    - If simulated... a real Mayday has priority!

- Terminate with a low approach if not on the active runway
  - Early go around to prevent a conflict is a gold star
    - Ask Race 12!
Passing – It is overtaking aircraft’s responsibility to pass well clear.

Pass on right unless racer being passed is way wide and you can keep him in sight.

Formation on course
  * Just because you are racing does not mean you can ignore formation with plane on your left.
  * You are the Wingman until the pass is complete
    * Defined by a “Clear” call or obvious nose to tail and opening
Passing

Good Pass!
Passing Geometry

Pull to soon and you back up your aircraft into the one you are passing!
This is perfect position for pass
* Not so perfect areas for passing!
What it takes to Pass PRS

- Close Formation
- Turning Rejoins
- Upset Recovery
- Level turns on the course
- Proper passing technique
- Proper execution of Simulated emergency
- Situational Awareness
- Knowledge/Compliance with rules and SOP
- Buy-in to the Sport Class Culture of Safety and Racing Excellence
RACE WEEK
Look-Ahead
Learning Objectives

* Understand the differences in operations between PRS and the races

* Learn how to Qualify
What is Different?

* Some things are easier
  * Less events on your schedule
  * More time between events
  * More Structure

* Some things are harder
  * Self induced stress
  * More distractions
  * More distractions
  * More distractions
Arrival

* Arrive by Noon on Saturday
* “Prop no turn” line in effect
* Check in with Bob, Rick, or Bob for assigned parking
* Register
* Tech Inspection
Tech Inspection

- Performed by Sport Class Tech inspectors
- Checks compliance with Sport Class Rules
- Top cowl removed
- Wheel pants removed for brake inspection (FG Aircraft)
- Overall airworthiness items checked
- Equipment Check:
  - Flight Suit
  - Helmet
  - Gloves
  - Fire extinguisher

- Testing affidavit – Class and RARA Certification Signature
  Test to your anticipated max qual speed plus 5%
  Pull 4.5 g (50 percent over the course cert 3 g)
In September we have a Ramp Chief to control everything that happens in our area of ramp.

- He maintains contact with Race Control
- Coordinates Engine Start times
- He enforces ramp rules
- Makes sure correct pilot is in each airplane (don’t laugh)

Our Ramp Chief is Bob Fair
Sunday--Practice

- Practice Session Sunday (if Tech Inspected)
- Conducted like PRS
Qual Mon-Tues-Wed

- 2 periods on Mon and Tues
- 1 period on Wed
- Operated exactly like PRS
- Leads will manage their flights to ensure all get qualified

- Quals have priority over practice
- Must have Qual time to race
- Qual speed determines start position
Qualifying

Get Some!!!
Qualifying

- All Aircraft must qualify during one of 5 periods.
- No make-ups
- Qualifying times determine the heat and starting position within the heat
- ALL Qual laps are flown on the LONG course
- There is no Qual practice at PRS
How to Qualify

- Must fly one level lap – no diving to start the qual laps

- When you are ready to qualify call at Pylon 4, “Timers, Race # for two laps”

- Timers will usually answer “Race # will be on the clock next time around Home Pylon”

- Timers may or may not say you are on the clock after Home Pylon
  - Fly as if you are on the clock

- Timers will call “Race # you have a time”
Qualifying Contingencies

* Only 3 racers on the course if any racer on the clock.
* Only 2 racers on the clock at one time
  * May increase to 3
* We schedule qualifying in advance through Flight Lead.
  * Lead will call people off the course and into the Queue when someone is qualifying
    * Sequence should be briefeded as well
* Race Control usually will track who is cleared on the course
* Good practice to leave the course at the home pylon
  * Don’t pull up early at home on final qual lap
* Be predictable and use the radio

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Additional Contingencies

- You may opt for 1 lap or 2
  - If you opt for 2 laps, the faster of the 2 laps will be used.

- If you opt for 1 lap, you can accept or reject that speed (within 60 mins)
  - If you reject speed, you get 1 more lap
  - If you accept the speed, you do not get another lap to improve it

- If you pull off course before 1 lap, it’s a non event
- If you pull off the course after 1 lap, you may accept or reject that speed (within 60 mins)
  - Same as if you called for 1 lap

- There are no re-quals once 2 laps have been run

Revised March 2015
**First Race of the Week is Medallion Heat on Wednesday**

**Bronze, Silver and Gold Heats on Thursday**

**Four races a day Friday, Sat, Sunday**

**Last recorded speed determines Heat and Starting Position in the Heat**

- New Progression rules do not allow movement between T-6 and Sport Courses
Race Procedures

* Same as PRS except with more airplanes and Pace
* Schedule is easier, but more distractions
* Once you walk across the crowd line...
  * 100% concentration on Flying
    * Anticipate the flow of events
    * Consider contingencies/emergencies
Taxi for a Race

- 9 airplanes plus Pace plus a spare parked in 2 lines
- Ramp Chief coordinates start time
- Pace makes all radio calls
- Procedures are same as PRS except Pace taxis last
Line-up for Racing

- Line-up is identical to PRS procedures except that after everyone is in position, Pace taxis by and looks for a thumbs up.

- Pace calls 60 knots

- There will likely not be airplanes on the course, in which case early cut-off may be allowed
Line-up Rwy 8
Line-up Rwy 26
Rejoin

* Lead makes wide turn

* 9 airplanes are a lot to keep track of

* Don’t fly low on rejoin - you will be out of sight

* Leave room in the formation for laggards
Enroute to the Chute

- Slow movements
  - They magnify toward the end of the echelon
- Do not get low
  - Disappear from view
- Hold position first. Manage cockpit second.
- If you get ahead, call Pace and clear to the outside
- NEVER NEVER NEVER back up into the formation
- Erratic flying is sent to 1000 ft trail
The Chute

- Pace calls the flight to Line Abreast
- Pace lines the flight up aimed at the Guide Pylon
- Pace directs airplanes in formation to move up or back
- When satisfied with the formation, “You have a Race”
- Pulls up abruptly, over, and behind formation
  - Pace follows flight through start
  - Pace is also a start judge
“YOU HAVE A RACE”

* Contract First, Race Second!
* Fly off racer to left—stay in “lane”
* DO NOT DIVE—Disqualified!
* Do not Slingshot—Disqualified!
* It is the passing aircraft’s responsibility to ensure nose to tail clearance with aircraft being passed.
* Lane must me maintained until 45 deg past Pylon 4, unless verbally cleared
* Safety of Flight is critical during start
  * Reno Races are not won in the start!
NEVER, EVER TURN RIGHT!

Accept a pylon cut if you have to, but DO NOT TURN RIGHT!

Forced cuts can be protested.
They really do wave flags!

Radio Call from Race Control “White Flag”
  * One lap to go

Radio Call from Race Control “Checkered Flag”
  * Race is over next time you cross Home Pylon regardless of what lap you are on.
Pull up at home pylon, left into cool-down.
Follow the airplane in front—keep in sight
Cool down altitude is 7000 or above.
Cool down - calm down!
Race 3 “Out of Cool Down”
  Look for your Sequence
Race 3 “Downwind Abeam”
Race 3 “Base / Gear”
Tower makes mistakes, you are the PIC!!!
Clearance to Land is not required, PRS or NCAR
Preparation

- **MINDSET** - Recommend at least 30 minutes of uninterrupted quiet time before staging. Think out contingencies—engine failure, airframe malfunction, closed runway.

- **FUEL** - enough to hold for 20 minutes and divert to Reno Cannon International.
  - 5 extra gallons of gas makes no difference on lap time, but may keep you out of the dirt!
Emergencies

- Each Aircraft type presents different challenges
  - Pre-think your plan

- Break-out sessions with suggestions for each aircraft type

- There are automatic responses that will help your chances of success
  - They result from preparation and practice (muscle memory)
Mayday

- **Automatic response:**
  - Zoom climb inside the race course to Best Glide Speed
  - Call “Race 3 Mayday”
  - (CFR scrambles vehicles)

- Race Control responds with winds—listen and pick your runway
  - Announce intentions if possible

- Aim 1/3 of the way down the runway
Engine Failure on Take-off

- Maintain Aircraft Control
- Right after lift-off--aim straight down the runway
- Fuel Pump on
- Consider switching tanks if time allows
- Consider crossing runways if time and altitude allows
- Consider Gear Up if landing off pavement
- Continue to fly the airplane as far “into the crash” as possible
- Think through various scenarios before PRS and race week

Revised March 2015
Engine Failure at Start of Race

- Zoom to best glide speed
- Call “Mayday”
- S turn behind formation if speed and altitude require
- Runway 26 or 32 are best choices from the Chute
- Aim 1/3 of the way down runway
- Gear Down only after landing on runway assured
Engine Failure on Race Course

- Zoom up and to left (inside course) to best glide speed
- Call “Mayday”
- Choose appropriate Runway
  - Resist temptation to favor the runway you took off from
- Fuel Pump/switch tanks
- State intentions if possible
- Aim 1/3 of the way down the runway
- Gear down only after landing on pavement assured

Revised March 2015
Loss of Control

Know your aircrafts characteristics

- Consider flight control positioning
  - Neutral? Anti-Spin?

- Consider reducing power

- Consider deploying speed brakes

- Consider extending landing gear
* During Mayday, all other aircraft continue racing

* Remember—Biggest problem is denial

* Bernoulli determines aircraft position—not Marconi
Propeller Over-Speed

- The single most common cause of Emergencies/Engine Failures
  - Much has been written on the subject
  - Can be caused by high oil temps or over-boost
  - Counter-weighted Props recommended for high performance engines
  - High Flow Governors
  - Consider resetting the fine-pitch stops
Sport Class Case Studies

- Oil Pressure loss - propeller goes flat and departs aircraft - Successful landing

- Internal parts in engine fail - Unsuccessful landing

- Engine Failure on take-off - Successful off pavement landing

- Airframe overstress after PIO - Fatality
State-of-Mind

* No one makes money Racing at Reno

* The winner is a determined based on advance airplane preparation—not last minute efforts

* GOAL--Have a great time, go home with new friends, new memories, and in the same airplane you brought.
Common Infractions

- Pylon Cut—penalized 2 sec per lap (typically 12 sec)
- Low Flying—disqualification (or ban)
  - Pylon Judges
  - Contest Committee
  - Timers
- Unsafe Flying—disqualification
- Deadline cut—disqualification
- Improper Pass
Keys to Safety

- Procedural Knowledge
- Standardization
- Situational Awareness
- Flight Discipline/Airmanship
- Attitude
Sport Class Culture

- We are disciplined in the air
  - We take the responsibility we have to each other seriously
- We help each other
- We are here for the joy of flying and the camaraderie
- We seek self improvement
- We take pleasure in a well prepared airplane and a well flown race
- Our Core Values are Safety, Racing Excellence and Teamwork

*If you don’t fit into our culture—you don’t fit into our Class*

*If you buy in to our culture, we welcome you to the brotherhood of Air Racing!*
GO Fast, Turn Left, and Have Fun!

Questions?

Thank you