

Accident Prevention

How to Reduce Mid-Air Collision
Potential

Actual midair accident that occurred in December at the Plant City, Florida, Municipal Airport when the pilot of the Piper (the top plane) didn't see the Cessna in a pattern for Touch and Go's. The Cessna was carrying an Instructor and a student - the student was practicing Touch n Go's. No one was injured.



Collision Avoidance

- Statistics
 - 82% at converging, overtaking angles – slow speeds!
 - 5% were head-on
 - 77% at or below 3000 ft
 - 49% at or below 500 ft
 - “Enroute” collisions were below 8Kft, within 25 nm of an airport
 - Pilot experience not a demographic – from no time to high time

Mid Air Factors ... ?

- Increased traffic
- Higher closing speeds
- Eye limitations – 10 seconds to:
 - spot traffic
 - identify it,
 - realize it's a collision threat,
 - react, and
 - have his aircraft respond

Eye Limitations

- Eyes are susceptible to many things
 - Physical: dust, germs, age, alcohol, eyeglasses, “floaters”
 - Environment: atmospheric conditions, windshield distortion, oxygen, acceleration, glare, heat, lighting, aircraft design
 - Mental: fatigue; emotion, optical illusions, auto-kinesis



Symptomatic Problems

- Binocular Vision (NTSB study)
 - Cueing required to be registered by both eyes
 - If visible to one eye only, the mind may not register it
- Narrow Field of Vision
 - 200 deg arc detection range
 - 10-15 deg classification range
 - Optic nerve blind spot
- Blossom Effect
 - Relative motion = 0 if on collision course
 - Canopy splatter / dirt / imperfections hide stationary objects
 - 10 sec reaction time, but closing speeds converge less than that

Symptomatic Problems

- Clutter Effect
 - “Busy” background makes it hard to detect
 - Haze blurs
- Lighting conditions
 - Backlighting enhance target
 - Glare obscures target
 - Cloud / lighting variables
- Focus problems
 - Close and dark panel vs bright distant targets

Scanning Techniques

- Cannot scan everywhere, so concentrate on areas most critical to phase of flight
 - Traffic pattern – immediate area
 - Gentle S-Turns, clearing turns
 - Landing – focusing on touchdown point
 - Opposite direction traffic?
 - Normal flight
 - +/- 60 degrees side-to-side
 - +/- 10 degrees vertically
 - Powered aircraft descending into the Vegas area

Scanning Techniques

- Studies show 17 seconds out, 3 seconds in
- Stop and focus in distinct areas
 - Side-to-side, left to right to left
 - Center to left, center to right
 - Return to instrument panel
- Check behind and above in aircraft blind spots
- Head should be on a swivel

Collision Avoidance Checklist

- Check yourself
 - Eye exams / physical condition
 - Good mental condition / attitude (IMSAFE)
- Plan ahead
 - Organize charts & documents
 - Familiarize yourself with local area ops
 - Review plan for high-density areas
 - Review soaring RoE
 - NOTAMS for traffic, jumpers, hang gliders, etc.
- Clean wind shield / windows

Collision Avoidance Checklist

- Adhere to SOPs
 - Observe RoE (turn direction / away from ridges / RoW and passing rules / etc.)
 - Communicate on / listen to CTAFs
 - Enter traffic patterns properly, fly them properly
 - Minimum duration at VFR cruise altitudes
 - Stay away from Victor airways
- Avoid Crowds
 - Find different thermals than everyone else?
 - Jump areas / “typical” thermaling areas
 - Arrival routes for IFR traffic
 - VFR corridors

Collision Avoidance Checklist

- Compensate for design
 - Know where aircraft blind spots are
 - Take steps to check them when able
- Equip for safety
 - Light-weight transponder ... ?
 - Poor-man's TCAS ... ?
- Radios
 - Talk and listen to them (listen more than talk)
 - Occasional position reports
 - Listen to CTAF
 - CAREFUL, though ... pilot reporting accuracies in effect!
- SCAN!

LVVSA Safety Tips

- Tow pilots:
 - Major objective – maintain separation from the glider
 - Pick up a visual on the glider
 - execute the 90° turn
 - maintain separation until safe to descend
 - else pick up a vector away from the glider and use airspeed difference
 - look for other gliders and air traffic as well
 - note areas of lift and sink, descend in sink
- Glider pilots:
 - Major objective - maintain separation from the tow plane
 - Maintain visual with tow
 - After right turn off tow, turn back to heading and visually follow tow till he's safely away
- More frequent turns to “check 6”
 - Coming back from Clark Mountain