

# YOUR ROLE IN COLLISION AVOIDANCE

Studies of midair collisions by the National Transportation Safety Board (NTSB) determined that in most cases the aircraft involved were:

- Engaged in recreational flying, and had **NOT** filed any type of flight plan.
- Flying in VFR weather conditions during weekend daylight hours.
- Flying at or near non-towered (uncontrolled) airports and at altitudes below 3,000 feet.
- Flying in daylight with visibility greater than 3 miles.
- Piloted by all experience levels--from pilots on their first solo to 20,000-hour veterans.
- Piloted by flight instructors in 37% of the accidents studied.
- The result of a faster aircraft overtaking and hitting a slower aircraft.

## COLLISION AVOIDANCE CHECKLIST

Accomplishing the following items every time you fly will greatly reduce your chances of being involved in a near miss or midair collision.

**Check yourself:** Start with a check of your own condition. Your eyesight, and consequently your safety, depends on your mental and physical condition.

**Plan ahead:** Plan your flight ahead of time and practice good task management in the air. Have charts prepared in proper sequence and within easy reach. Keep the cockpit free of clutter. Be familiar with headings and frequencies ahead of time so you can spend more time scanning and less time “heads down” looking for things.

**Clean your windows:** Make sure the windshield is clean and clear of obstructions.

**Brief passengers and crew:** More people scanning can greatly increase your margin of safety.

**Follow the S.O.P.s:** Stick to standard operating procedures and observe all flight regulations such as correct hemispheric altitudes and proper traffic pattern procedures. Know and follow all applicable rules for the airspace you’re flying in. Be predictable. In most mid-air collisions at least one of the aircraft involved wasn’t where it was supposed to be.

**Avoid congested airspace:** Plan to fly over or around high density traffic areas such as the airspace over a nav aid (passing slightly left or right is safer). Also, plan to pass over all airports at a safe altitude and be particularly careful in the Wichita B-Hive. (see page 12)

**Compensate for design:** Know your aircraft limitations and blind spots. An example would be a low wing descending and overtaking a high wing.

**Increase your visibility:** Turn on appropriate lights (strobe & anti-collision) whenever your engines are running. Also turn on your landing lights when below 10,000 and within 10 miles of an airport. Increase your radar and TCAS visibility by using a transponder and adjusting it to reply on both Mode 3/A and Mode C.

**Talk and listen:** Use your radios and communicate your intentions, especially in the traffic pattern. (i.e. Unicom) Make frequent position reports along your route of flight. Monitor the appropriate ATC frequencies at all times and listen up for other pilots making position reports.

**Use ATC services:** Participate in flight following and request traffic advisories.

**Don’t get complacent:** There is no guarantee that everyone is flying by the rules. Additionally, many midair collisions occur during periods of instruction or supervision.

**Use proper cockpit lights at night:** Even momentary use of white light disrupts your night vision.

**Beware of wake turbulence:** Most large aircraft produce violent wake turbulence.

**Scan and clear constantly:** Use proper scanning techniques and understand the limitations of your eyes. As your eyes become fatigued they become less efficient at seeing aircraft. Clear in the traffic pattern and before all climbs, descents, turns, or acrobatics. If you see military aircraft, scan ahead and behind; they frequently fly loose formation often separated by a mile or more.

## **GUIDE TO AN EFFECTIVE SCAN**

Your best defense against midair collisions is an effective scan pattern. There is no perfect scan and no single scan technique that is best for all pilots. The most important thing is for each pilot to develop a scan that is both comfortable and workable.

Knowing where to concentrate your search is the first step to a proper scan. Concentrate on the area most critical to you at any given time rather than trying to look everywhere. Remember to clear before every turn in the traffic pattern and always look for other aircraft entering the pattern. Also, during climbs and descents make gentle S-turns to increase your field of view and allow other pilots a greater chance of seeing you. Next, always remember to make clearing turns before attempting any maneuvers such as Pylons or Stalls. Finally, never forget to look behind and below your aircraft during final approach to avoid tunnel vision; pilots often lock their eyes on the touchdown zone.

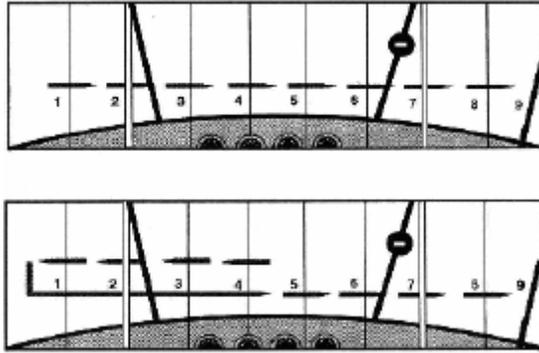
In normal flight you can generally avoid the threat of a midair collision by scanning 60 degrees to the left and right of your central viewing area. Additionally, a vertical scan of 10 degrees up and down will keep you safe. This will allow you to spot any aircraft that might prove hazardous to your own flight path, whether it is level with you, below and climbing, or above and descending. If another aircraft appears to have no relative motion, but is increasing in size, it is likely to be on a collision course with you.

## **SCAN PATTERNS**

The scan that works best for most pilots is called the 'block' system. This type of scan is based on the theory that traffic detection can be made only through a series of eye fixations at different points in space. By fixating every 10-15 degrees, you should be able to detect any contrasting or moving object in each block. This gives you 9-12 blocks in your scan area, each requiring a minimum of one to two seconds for acclimation and detection.

One method of block scanning is the 'side-to-side' motion (top picture). Start at the far left of your visual area and make a methodical sweep to the right, pausing in each block to focus. At the end of the scan, return to the instrument panel. A second form of block scanning is the 'front-to-side' version (bottom picture). Start with a fixation in the center block of your visual field. Move your eyes to the left, focusing in each block, swing quickly back to the center block, and repeat performance to the right.

There are other methods of scanning, but unless some series of fixations are made, there is little likelihood that you will be able to detect all targets in your scan area. When the head is in motion, vision is blurred and the mind will not register targets as such.



Developing an efficient scan takes a lot of work and practice, but it is just as important as developing good landing techniques. The best way is to start on the ground, in your own airplane, or the one you usually fly, and then practice your scan during every flight.

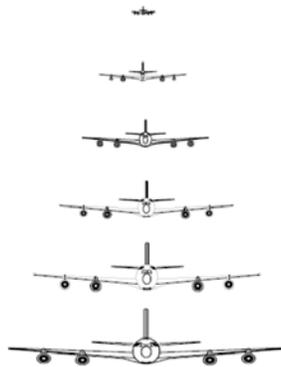
## **AIRCRAFT CLOSURE RATE CHART**

**Based on the combined speeds of two aircraft.**

### **AIRCRAFT CLOSURE RATE CHART**

Based on the combined speeds of two aircraft.

Distance	Seconds	
	At 600 MPH	At 210 MPH
10 miles	60	170
5 miles	30	85
3 miles	18	56
2 miles	12	38
1 mile	6	18
.5 mile	3	9



Taking into account the recognition and reaction times shown in the table; the shaded blocks in the chart above indicate distances where aircraft on a collision course would surely collide.