THE HIGH RISK

Midair Collisions in the Hornet Community

Midairs and Near-Midairs

DoD Instruction 6055.7 defines "midair" as "a collision between aircraft or UAV when intent for flight exists." This definition is universally accepted among all of the services. We had 13 midairs in naval aviation alone in the last 10 years, resulting in 17 destroyed aircraft, 36 deaths, and over $1 billion worth of damage. Mishaps have occurred during ACM, tanking, tactical formation flight, rendezvous, while landing, with other military aircraft as well as civilian, day, night—in every possible arena and timeframe. In every instance, aircrew error was cited as a primary causal factor in the mishap.

This information does not include the "near-midair collisions," which far outnumber actual midairs. A near-midair collision is defined as when aircraft pass close by one another and, as a result, the pilot-in-command feels the safety of the aircraft or UAV is in jeopardy:

- A collision is avoided by chance, rather than by a conscious act on the part of the pilot.
- A collision would have occurred had no action been taken.
- Two aircraft inadvertently pass within 500 feet of each other.

This issue of *Approach* features four articles that focus on midair and near-midair incidents.–*Cdr. Mike Scavone, fixed wing branch head, Naval Safety Center.*

By LCdr. Steve Kiggans

What is the most dangerous aspect of flying an FA-18? If you answered, "The risk of a midair collision (MAC)," you'd agree with most Hornet aircrew.

Skill-based errors are the most prevalent causal factor in MACs. Midair knowledge and avoidance should be one of the Hornet aviator's primary responsibilities to ensure flight safety. What are the hazards of MAC and the risk to Hornet aviators? What can you do to reduce the risk?

The majority of Hornet MACs occur in the admin phase of flight. Surprisingly, just over 50 percent take place during formation flight with an aircraft that was part of their flight element. Only 3 percent of collisions occurred with non-element traffic, while 39 percent took place in the fighter intercept and engaged arena. These collisions were not nuggets smacking into the old guys as one may think; flight experience does not offer immunity to the dangers of MAC.

How does situational awareness (SA) fit into the problem?

Not surprisingly, the most common causal factor in Hornet MAC accidents is a loss of or low situational awareness. Building and maintaining SA in all phases of flight is crucial to avoiding a MAC. SA is built and maintained by prioritizing tasks. When all else fails, aircrew must revert to basic aviating while clearing their flight path. SA is maintained through standardized tactics and communication in every phase of flight. Unbriefed tactics and off-the-cuff evolutions cause confusion, which decreases SA and increases the likelihood of a MAC.

Hornet aircrew must follow proper mission-crosscheck times (MCT) to make sure adequate time is available for flight deconfliction. A wingman's primary responsibility is flight-path deconfliction with other element aircraft.

The main way to avoid hitting other aircraft is through strong adherence to the see-and-avoid concept. An aircrew's ability to perceive an impending flight-path conflict is critical.

Several things impede an aircrew's ability to recognize an impending collision. Channelized attention prevents the eyes from properly scanning and reduces the brain's ability to process incoming information. The ability to spot conflicting traffic also can be hampered by poor eyesight; environmental effects, such as poor visibility and night operations; or by the limitations of night-vision devices (NVDs). Wear correction glasses if needed, and fully understand the limitation of NVDs.

Formation Flight

The majority of MAC incidents occur within a flight element—the result of misplaced attention and complacency. The Hornet community has seen everything from flight leads breaking into their wingmen in the overhead to aircraft bumping during a section PAR. Tactical-formation flying has provided the most significant contribution to the administrative Hornet-midair rate, attributed in part to decreased aircrew eyes-outside time and a low aircrew perception of collision potential.

Admin-phase MAC can be prevented through strong briefs and solid flight discipline. Discuss the risk of form-flight midairs in the ORM section of your brief. Dust off the mission-crosscheck time stuff you heard daily in the FRS, and discuss it in your brief. Aircrew must maintain a constant spatial awareness of flight-member positioning. If a conflict exists, use clear, concise communications and predictable aircraft maneuvers to maintain separation. The debrief is a good time to air any dirty laundry concerning a near MAC and to maintain accountability of each member of the flight element. Additionally, I suggest the flight lead should hammer the low SA high-closure-rate pilot as needed.

Air Intercepts and Combat Maneuvering

The air-to-air arena is a high MAC-potential environment. As the saying goes, "There are those who have had near-misses and those who will." Extensive briefing time is spent on training rules to avoid MACs; we emphasize that most Hornet collisions have occurred post knock-it-off.

Another big potential for MAC occurs when aircrews become complacent about assigned altitude blocks and stop continuously scanning for the cheater. Most importantly, aircrew must not get sucked into the radar scope, but they must scan continuously for both blue and red guys.

During engaged maneuvering, MAC risk increases when aircraft get slow. As a community, we have had several mishaps with aircraft under ballistic conditions and during slow-speed scissor fights. Following the training rules leads to everyone's safety and career longevity.

Air to Ground

The low number of midairs in the strike mission doesn't mean there is not a great degree of risk. Historically, the circular-bombing pattern offers one of the highest risks of midair. Although the community has not had a collision between aircraft on low-level routes, a significant risk exists. Task time-sharing is critical to avoid collisions. Mission-crosscheck times must be adhered to when aircrew become tasked to find targets, release weapons, and avoid terrain.

Non-Element Traffic

Hornet pilots are good at using the radar and visually scanning for traffic. These good habits translate into a very small number of midairs seen in the high-density traffic areas. The see-and-avoid concept must continue to have priority while transiting to and from the area.

Flying under IFR handling doesn't mean you can blow off a good look outside under VMC conditions: Always scan. The 250-knot speed limit below 10,000 feet was established to keep fast movers from hitting slow movers. Respect the speed limit, especially in high-traffic zones.

A good understanding of IFR- and VFR-traffic patterns is important to flight safety. Aircrew may be surprised by the amount of conflicting and converging airspace in their local area.

Hazard Reporting

Do Hornet aviators accept near-midair collisions (NMACs) as the price of doing business? We have very few NMAC hazreps on the safety boards to maintain awareness and define high-risk evolutions and situations. A MAC SIR (safety investigation report) is too late to be reading about a known hazard. Fess up and let everyone learn from your "lucky to be alive" story.

Conclusion

The high risk of MAC in our community never will go away as long as we continue to fight as a team. The job of the Hornet aircrew is to mitigate this risk to the greatest extent possible by maintaining MAC awareness and knowledge. Our primary focus should be on enhancing good collision-avoidance habits in briefs, reinforcing them in flight, debriefing good habits, and correcting poor ones. Remember, you are not the only one trying to get to that merge, into that control zone, or to the initial. Don't hit me!

LCdr. Kiggans flies with VFA-195.

Squadron SOPs should address MAC avoidance. A good start is to emphasize mission-crosscheck (MCT) times and discuss the specific procedures expected of a wingmen who has lost sight in the admin and tactical phases of flight.

Building SA starts in the preflight brief; high midair-risk portions of the flight must be identified and hazard-mitigation techniques discussed thoroughly. Briefing and adhering to MCT is a good technique for preventing midairs, while altitude-block adherence and techniques for gaining tallies helps build SA. If inter-element midair potential is determined to be too great in particular phases of the flight, the flight lead should consider offering individual altitude assignments to increase available MCT.—LCdr. Milt Carlson, FA-18 analyst, Naval Safety Center.

Mishap-Free Milestones

VAW-121	75,000 hours	39 years
HSC-3	200,000 hours	31 years
VFA-136	50,000 hours	12 years 3 months
VAQ-140	30,940 hours	20 years
VMFA(AW)-332	100,000 hours	27 years
VP-9	165,000 hours	27 years
VAW-125	71,597 hours	37 years
VP-8	164,000 hours	27 years
VRC-40	96,700 hours	22 years
VFA-131	75,281 hours	18 years
Pacific Fleet Executive Transport Detachment	16,300 hours	20 years