Mid-Air Collision Avoidance

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In central New Jersey, we're right in the middle of one of the busiest air traffic corridors in the world. There are over 50 civil airports in New Jersey, servicing thousands of general aviation aircraft.

Located within 100 miles of Joint Base McGuire-Dix-Lakehurst (JB MDL) are busy international airports like Kennedy, Newark, La-Guardia, and Philadelphia. These airports alone generate over 5000 traffic movements a day. McGuire and Maxfield (Lakehurst) airfields add as many as an additional 100 movements per day to this already staggering traffic flow. As a major center for cargo operations heading to Europe and a valuable training area for low flying military aircraft, JB MDL's airspace is very crowded. The potential for a disastrous mid-air collision is real and must be recognized.

This poster is presented in the interest of mid-air collision avoid-ance. Here at JB MDL, we recognize that we all share a responsibility to see and avoid. This mutual responsibility is integral in our continuing desire to create a safe flying atmosphere wherever our airplanes operate. Please contact the 305 AMW Flight Safety Office at (609) 754- 5851 with any comments, concerns, or questions.

LIMITS OF THE HUMAN EYE

No pilot is invulnerable to a mid-air collision. The most successful tools to mitigate the threat of a mid-air collision are to effectively scan for other traffic and to know the limitations of the human eye.

Nearly all mid-air collisions occur during day/VFR conditions. The majority happen within five miles of an airport, on warm weekend afternoons. Most mid-air collisions occur in the traffic pattern with about 96 percent occurring at or below 3000 feet AGL and 40 percent occurring at or below 500 feet.

The highest risk, 47 percent, of a mid-air collision comes from overtaking traffic. Thirty-nine percent develop as a result of traffic converging from the side and only 14 percent are attributed to head-on traffic.

Failure of aircrews to see and avoid using proper scanning techniques is the cause of most mid-air collisions. It is essential to understand the limits of human vision and tactics to compensate for its deficiencies.

ACCOMMODATION: The time it takes to refocus on an area. It takes one to two seconds to refocus your eyes from inside the cockpit to an aircraft one mile away.

EMPTY FIELD MYOPIA: If there is little or nothing to focus on, we do not focus at all. We stare but see nothing. To counteract, periodically refocus on the farthest object within sight.

OPTICAL ILLUSIONS: Large, heavy aircraft flying at pattern speeds and altitudes fly in a slight pitch up attitude. This gives the appearance that the aircraft is climbing when they are actually straight and level.

FOVEAL FIELD: Part of the retina where vision is most acute. It is comprised of a very small area, just 1 degree both horizontally and vertically. Therefore, if you are staring straight ahead, you are missing a huge amount of the sky.

BLOSSOM EFFECT: At a distance, an aircraft on a collision course with you will appear to be motionless. It will remain in a seemingly station-ary position - not growing in size and then suddenly "blossom" into a huge aircraft filling your windscreen. At that point there may be little or no time to react. Notice this early and deconflict.

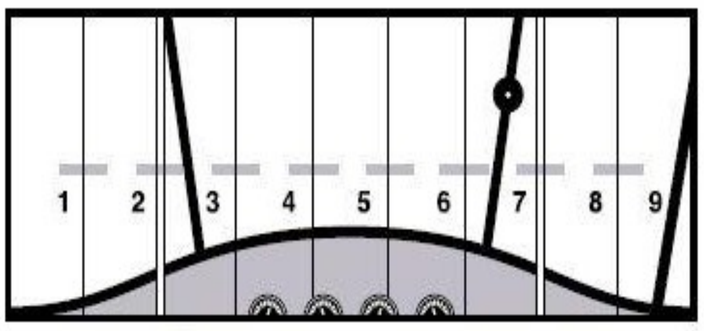
LEARN TO SCAN PROPERLY!

Flying IFR and depending upon ATC to protect you is not foolproof. Air traffic controllers are human, too. Glancing out and giving it the "once around" without stopping to focus on anything or staring at one spot is useless as well.

- Clear yourself before every turn
- Make shallow s-turns on descents and climbouts
- Scan your field of view from left to right and 10 degrees up and down

A SCANNING TECHNIQUE

Divide the sky into blocks, each spanning 10-15 degrees of the hori-zon, and 10 degrees above and below it. Scan from left to right, focusing on a point in the center of each block. Focusing allows the eye to detect a conflict within the foveal field. At the end of the scan, momentarily return to the instrument panel, and then start the scan over. Try to acquire a variety of scanning techniques as this will help avoid the monotony of using one method all the time.



Information is taken from AOPA Safety Advisor: Operations and Proficiency No. 4, Collision Avoidance Strategies and Tactics (2009).

Boeing C-17A Globmaster III

The C-17 is the Air Force's newest and most dynamic airlifter. With both strategic and tactical utility, the C-17 can deliver cargo and troops anywhere, anytime. With its high wing con-figuration and large "T" tail, the C-17 resembles the C-5, but is smaller and is distinguishable by its winglets. C-17's routinely fly VFR between McGuire Field and Maxfield Field (Lakehurst) along the borders of R-5001 at 1500 ft and 2500 ft AGL. C- 17's also fly formation low level airdrop routes in and around the Coyle DZ. The C-17 is transponder equipped and has VHF/UHF capability.

McDonnell Douglas KC-10 Extender

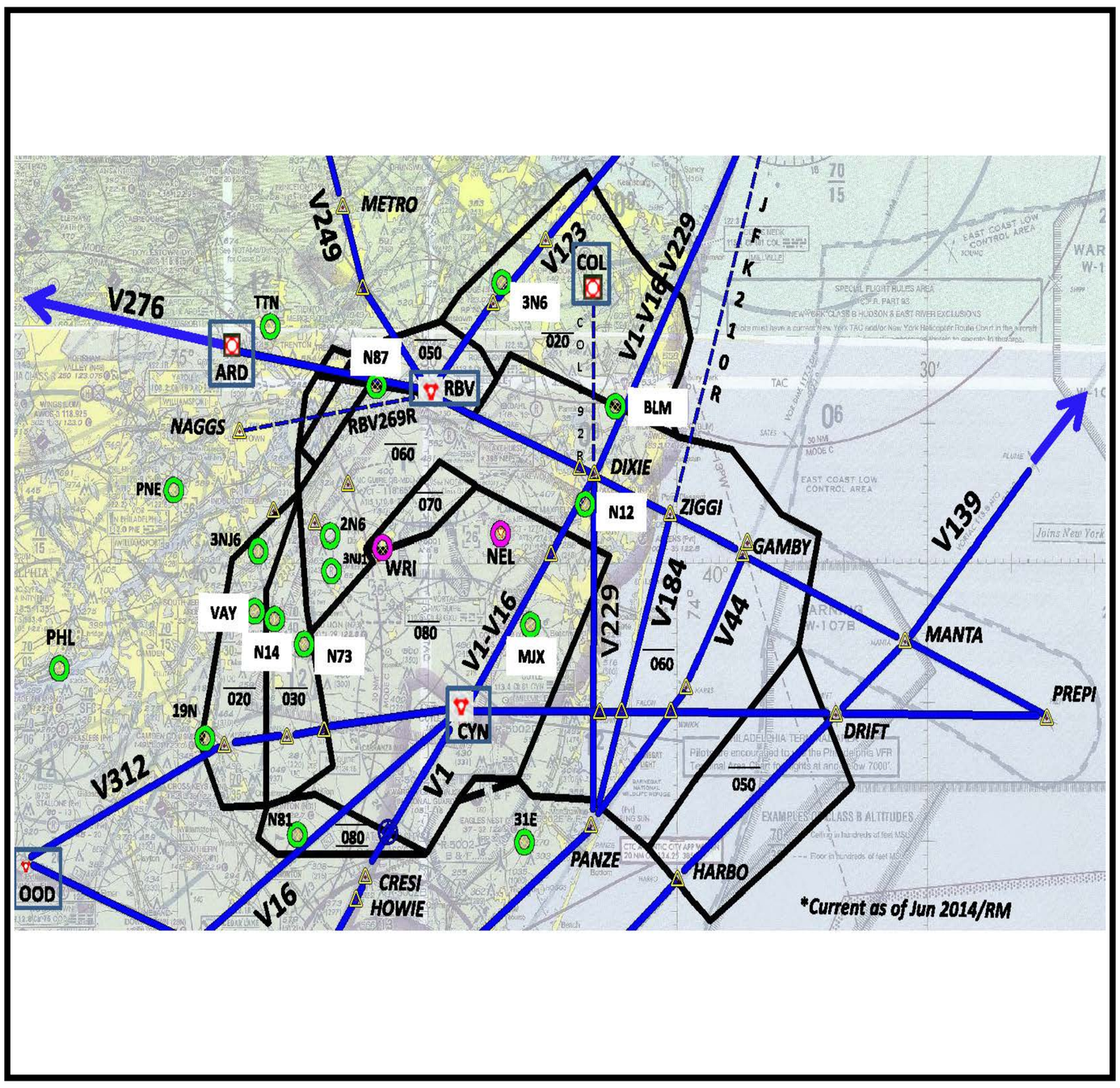
The KC-10 is a long range, high speed, three engine jet tanker/ transport aircraft. It is a wide-body, heavy aircraft that can takeoff weighing up to 590,000 lbs. The KC-10 can easily be identified by its vertical stabilizer-mounted engine and large air refueling boom below the horizontal stabilizer. KC-10's can frequently be seen in McGuire's IFR and VFR patterns flying at altitudes up to 3000 feet MSL and airspeeds up to 250 KIAS. The KC-10 is transponder equipped and has VHF/ UHF capability.

Boeing KC-135 Stratotanker

The KC-135 is a long range, high speed, four engine, jet tanker aircraft capable of takeoff weights in excess of 290,000 lbs. With a fuel off-load capability of over 12,000 gallons, the KC-135's primary mission is to extend the range of USAF, USN, and allied military aircraft. The KC-135 is a military ver-sion of the Boeing 707 and is characterized by its swept wings and its air-refueling boom located below the horizontal stabi-lizer. Like the C-17 and KC-10, training missions are con-ducted in McGuire's Class D airspace at altitudes and air-speeds up to 3000 feet MSL and 250 KIAS. The KC-135 is transponder equipped and has VHF/UHF capability.

Lockheed C-130 Hercules

The C-130 is a medium-range, four engine, turboprop military transport aircraft. It is a medium sized aircraft with takeoff weights of about 150,000 lbs. They are operated out of McGuire Airfield by both the military and civilian contractors. The C-130 is approximately the size of the Boeing 737 and is easily recognized by its four large props. The C-130 is trans-ponder equipped, has UHF/VHF capability and may be operat-ing in the McGuire pattern at speeds between 150 KIAS and 250 KIAS.



Beechcraft C-12 Huron

The C-12 is a light, twin turboprop transport aircraft based on the civilian Beechcraft Super King Air. It is operated by multi-ple services at JB MDL. The C-12 has multiple roles and can be seen operating out of both McGuire Airfield and Maxfield Field (Lakehurst) at speeds around 200 Knots. The C-12 is transponder equipped and has VHF/UHF capability.

Sikorsky UH-60 Black Hawk

The UH-60 is a twin engine, medium lift utility helicopter. The Black Hawk has a 4 blade main rotor and a 4 blade tail rotor and can reach speeds of 160 Knots. They operate day and night around Maxfield Field (Lakehurst) and regularly fly in formation and at low altitude.

Bell UH-1 Twin Huey

The UH-1 is a medium sized military helicopter. It has a 2 blade main rotor, a 2 blade tail rotor and can be operated at speeds up to 120 Knots. The UH-1 will be operating day and night and will generally be at low altitude. It is transponder equipped and has VHF/UHF capability.

Sikorsky CH-53 Super Stallion

The CH-53 is a large military helicopter designed for heavy lift missions. It has an 80 ft, 7 blade main rotor and a 4 blade tail rotor and can cruise at speeds of 150 knots. It is transponder equipped and has VHF/UHF capability. Be aware of down-wash when operating in the area of a Super Stallion.

Bell AH-1 SuperCobra

The AH-1 is a twin-engine attack helicopter. It has a 2 blade main rotor, a 2 blade tail rotor and can be operated at speeds up to 190 Knots. The AH-1 will be operating day and night, mainly around the runways at McGuire Airfield and Maxfield Field (Lakehurst), and to and from the restricted area R-5001. It is transponder equipped and has VHF/UHF capability.

WAKE TURBULENCE

Vortex encounters can occur behind any-sized aircraft and often happen in VFR conditions. Pay close attention to the altitudes large aircraft are operating at (usually 2000 or 3000 MSL in the McGuire radar pattern). If passing behind a large aircraft, fly above their alti-tude. C-17's regularly practice steep descents in the area, making it harder to judge the location of their wake. Wake turbulence can be deadly, especially when it occurs close to the ground. *All pilots fly-ing in the vicinity of large aircraft should exercise extreme caution and ensure adequate separation.*

LOCAL FORMATION DEPARTURES

JB MDL frequently launches C-17 and KC-10 formations of up to 4 aircraft with 1 minute separation. The elements will then rejoin and fly in one-mile trail formation utilizing 500 feet altitude separation. *It is very important to realize that if you see one military aircraft, there may be others in formation.*

CRITICAL SECONDS

At normal closure speeds it takes about 10 seconds to cover 1 mile. If you stand 12 feet away from this poster, the pictures below depict what specific aircraft look like with 1 mile separation. React early; you may only have a few seconds to make a decision.

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