MACA

MID-AIR COLLISION AVOIDANCE GUIDE

AIR COMBAT COMMAND

VIDEMUS OMNIA

UNITED STATES STRATEGIC COMMAND

This handbook is intended to provide general information only and is not a definitive manual or chart. Always consult current FAA regulations, available charts and consider existing meteorological conditions. The charts are for information use only and are not to be used for navigation. Consult the latest issues of Sectional Charts and Airport/Facility Directories for flight planning. The United States Air Force accepts no liability for any claim arising under or as a result of reliance upon this handbook and reserves protection from liability as afforded under the Federal Tort Claims Act, 28 USC, Section 2680. The images included in this pamphlet are not intended to be used for navigational purposes nor to replace FAA approved navigational charts.

OFFUTT AFB, NEBRASKA
OCTOBER 2022

INTRODUCTION

Fellow Aviators:

The 55th Wing, Air Combat Command's largest wing, and the 595th Command and Control Group, are located at Offutt Air Force Base (AFB), Omaha, Nebraska. The 55th Wing is home to several C-135 platforms while the 595th C2G is home to the E-4B Nightwatch. Offutt AFB is also a crossroads for both Navy and Air Force aircraft transiting the country; therefore, there are times when the Offutt traffic pattern gets saturated with different types of aircraft. In addition, Lincoln Airport, home to the Nebraska Air National Guard's 155th Air Refueling Wing, who operate KC-135 Stratotankers, gets congested with both military and civilian traffic. Included in this pamphlet is information to familiarize you with our aircraft, their appearance and the routes and altitudes we fly.

In simplest terms, the goal of the MACA program is to make the skies in the vicinity of Offutt AFB the safest flying environment possible. Prepared jointly by Air Force Flight Safety offices and local air traffic control (ATC), this pamphlet contains valuable information to help manage your flying and increase your situational awareness around Offutt and Omaha's airspace.

Omaha, Nebraska has extensive use of privately owned aircraft, commercial aviation traffic, and some of the largest military aircraft the United States possesses. As our airspace becomes more congested, the possibility of a mid-air collision increases. Therefore, operations in our local area requires extra vigilance and increased awareness to effectively manage the risk associated with air traffic density.

The MACA program provides vital information to both military and civilian aviators to promote an environment of shared expectations and understanding. Communication with air traffic control agencies, aggressive clearing by aviators, use and monitoring of Traffic Collision Avoidance Systems (TCAS), and gen-eral knowledge of the airspace in and around the vicinity of Offutt AFB will help us safely operate together. Within these pages, you will find helpful information concerning our airspace, flight patterns, operating procedures, restricted areas and military aircraft familiariza-tion.

After reviewing this pamphlet, if you have any questions or concerns, please do not hesitate to contact the flight safety office(s) directly.

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Offutt AFB, NE 68113
55WG.SEF@us.af.mil
ph. (402) 294-3404

CONTENT

BRIEF HISTORY OF OFFUTT AIR FORCE BASE

Offutt AFB started as the airfield for Fort Crook Army Base in 1918, the home field for the 61st Balloon Company, an aerial observation unit. In 1924 the Fort Crook field was dedicated and renamed for 1st Lt. Jarvis Offutt, Omaha, Nebraska's first air casualty in World War One. Offutt Field became a central United States hub for Army Air Service and postal service transcontinental aviation and mail flights.

Military use of Fort Crook's Offutt Field was minimal until 1940, when the site was chosen to house a new aircraft production plant operated by the Glenn L. Martin Company. The very large plant produced B-26 bombers in great numbers, churning out over 1,500 of the medium-sized bomber from 1942 to 1944, when production switched to the new B-29 Superfortress. Both B-29s used in the atomic bomb missions that ended World War Two, the Enola Gay and the Bockscar, were Offutt-Martin planes.

After the war, Fort Crook became a military separation and demobilization center. In June 1946, Fort Crook Offutt Field and the Martin facility were both transferred to the U.S. Army Air Force and named Offutt Field. In 1947 Offutt Field became known as Offutt Air Force Base. In November 1948, Offutt became the headquarters for Strategic Air Command (SAC). SAC had overall command and control of the U.S. Air Force's nuclear strike detection and counter-strike forces.

Operational activities at the base in the Cold War included air refueling for strategic bombers and surface-to-air missile defense of the base. Offutt was also home to the EC-135 Looking Glass, a nonstop flying operation and mobile command post intended to be the last resort command center after a nuclear first strike. In the early 1960s Offutt also housed and controlled Atlas ICBMs, which were deactivated by 1965.

Offutt rapidly expanded its facilities in the early days of the Cold War adding a hospital, library, exchange, commissary, dormitories and family housing units. Significant secure, hardened buildings and bunkers were added to hopefully withstand a nuclear strike. The Air Force Weather Agency, now known as the 557th Weather Wing, was reassigned to Offutt in 1997.

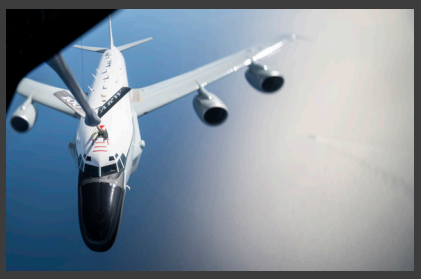
The end of the Cold War brought organizational changes to the Department of Defense. This included SAC transitioning from an Air Force command to a joint command called U.S. Strategic Command. This new, unified command was charged with deterrence of military attacks on the U.S. and its allies while employing armed forces to achieve national objectives.

LOCAL AIRCRAFT AT OFFUTT AFB

Offutt AFB is home to several large United States Air Force and Navy aircraft including a handful of C-135 variants, the E-4B, and the E-6B. Offutt also operates an Aero Club flying high and low wing light civil aircraft. In addition, other military aircraft such as the C-17, C-21, T-1, T-6, T-38, and C-37B frequent Offutt AFB.

C-135's

Offutt is home a handful of C-135 variants: RC-135V/W Rivet Joint, RC-135S Cobra Ball, RC-135U Combat Sent, and WC-135 Constant Phoenix. These four aircraft specialize in reconnaissance supporting theater and national level consumers with near real time on-scene intelligence collection, analysis and dissemination



RC-135V/W
RIVET JOINT

RC-135S
COBRA BALL

RC-135U
COMBAT SENT

WC-135
CONSTANT PHOENIX

Frequent Offutt AFB Visitor Aircraft

C-21 LEARJET

T-1 JAYHAWK

T-6 TEXAN II

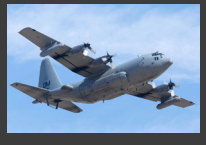
T-38 TALON

C-37B

MC-12 LIBERTY

C-17 GLOBEMASTER

EC-130 COMPASS CALL



OFFUTT AERO CLUB PLANES

E-4B NIGHTWATCH

The E-4B serves as the National Airborne Operations Center (NAOC) and is a key component of the National Military Command System for the President, the Secretary of Defense, and the Joint Chiefs of Staff. In case of national emergency, the aircraft provides a highly survivable command, control and communications center to direct US forces, execute emergency war orders and coordinate actions by civil authorities.

E-6B MERCURY

The E-6B serves as a communications relay and strategic airborne command post aircraft. It provides communications links designed to be used in nuclear warfare to maintain communications between the decision-makers (the National Command Authority) and the triad of strategic nuclear weapon delivery systems.

OFFUTT AIR FORCE BASE FIELD DESCRIPTION

Location: Offutt AFB is located on the Southeast side of the Omaha area near the city of Bellevue.

Runway & Unique Hazards

- Please reference official FAA documents.
- https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/

IFR Procedures

Airspace

- Offutt AFB is in Class C airspace controlled by Omaha Radar Approach Control (RAPCON).

Departures

- Normally restricted to 3,000 ft MSL and runway heading due to low altitude airways and arriving/departing commercial aircraft's flight path into Eppley Airfield.

Radar Traffic Pattern

- The radar traffic pattern altitude for Offutt AFB is 3,000 ft MSL. There are two smaller airfields near the edge of Offutt's radar pattern. These are Millard Airport (KMLE) and Plattsmouth Airport (KPMV). Aircraft operating near 3,000 feet around these airfields need to be alert for military aircraft operating in the instrument pattern.

VFR Procedures

Traffic Pattern

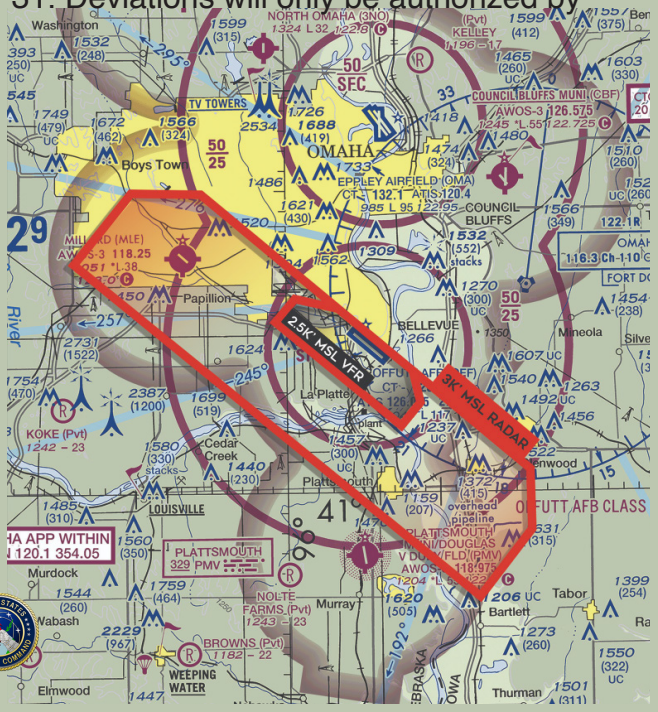
- The rectangular VFR traffic pattern altitude is 2,500 ft MSL. The overhead pattern is flown at 3,000 ft MSL. This is a tight visual pattern typically used by fighter aircraft. Traffic will most often be to the southwest of the runway, with right-hand traffic for Runway 13 and left-hand traffic for Runway 31. Deviations will only be authorized by the control tower.

Departures

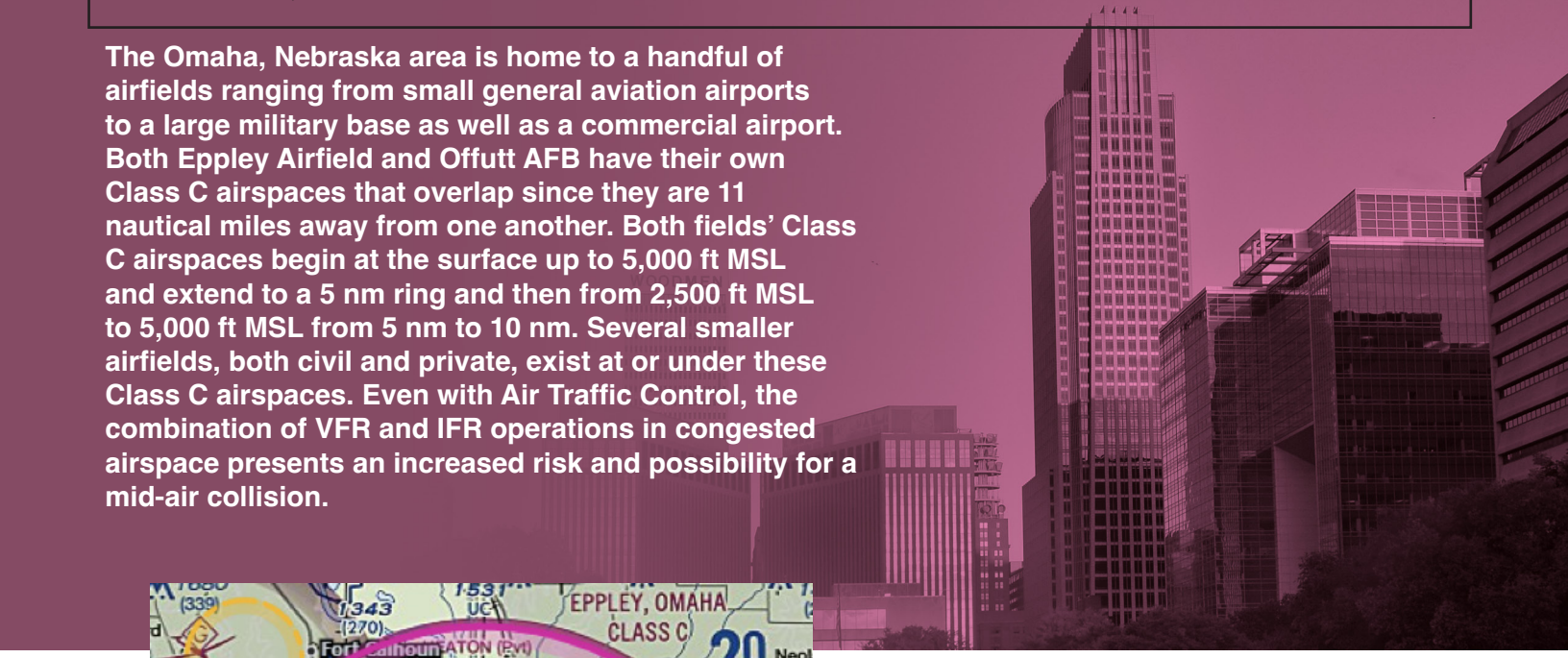
- Aircraft will maintain runway heading at or below 3,000 ft MSL until directed to turn by tower or approach control.

FREQUENCIES

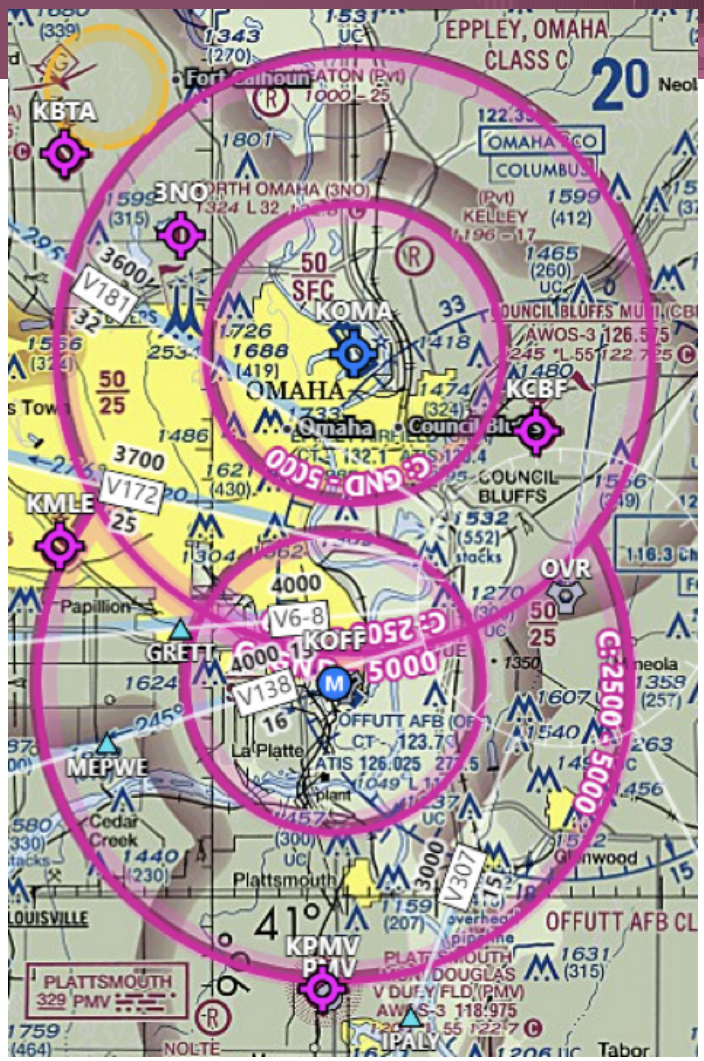
ATIS	**126.025**
OFFUTT GROUND	**121.7**
OFFUTT TOWER	**123.7**
OMAHA EAST APP/DEP	**124.5**
OMAHA WEST APP/DEP	**120.1**



OMAHA, NEBRASKA LOCAL AREA OVERVIEW DESCRIPTION



The Omaha, Nebraska area is home to a handful of airfields ranging from small general aviation airports to a large military base as well as a commercial airport. Both Eppley Airfield and Offutt AFB have their own Class C airspaces that overlap since they are 11 nautical miles away from one another. Both fields' Class C airspaces begin at the surface up to 5,000 ft MSL and extend to a 5 nm ring and then from 2,500 ft MSL to 5,000 ft MSL from 5 nm to 10 nm. Several smaller airfields, both civil and private, exist at or under these Class C airspaces. Even with Air Traffic Control, the combination of VFR and IFR operations in congested airspace presents an increased risk and possibility for a mid-air collision.



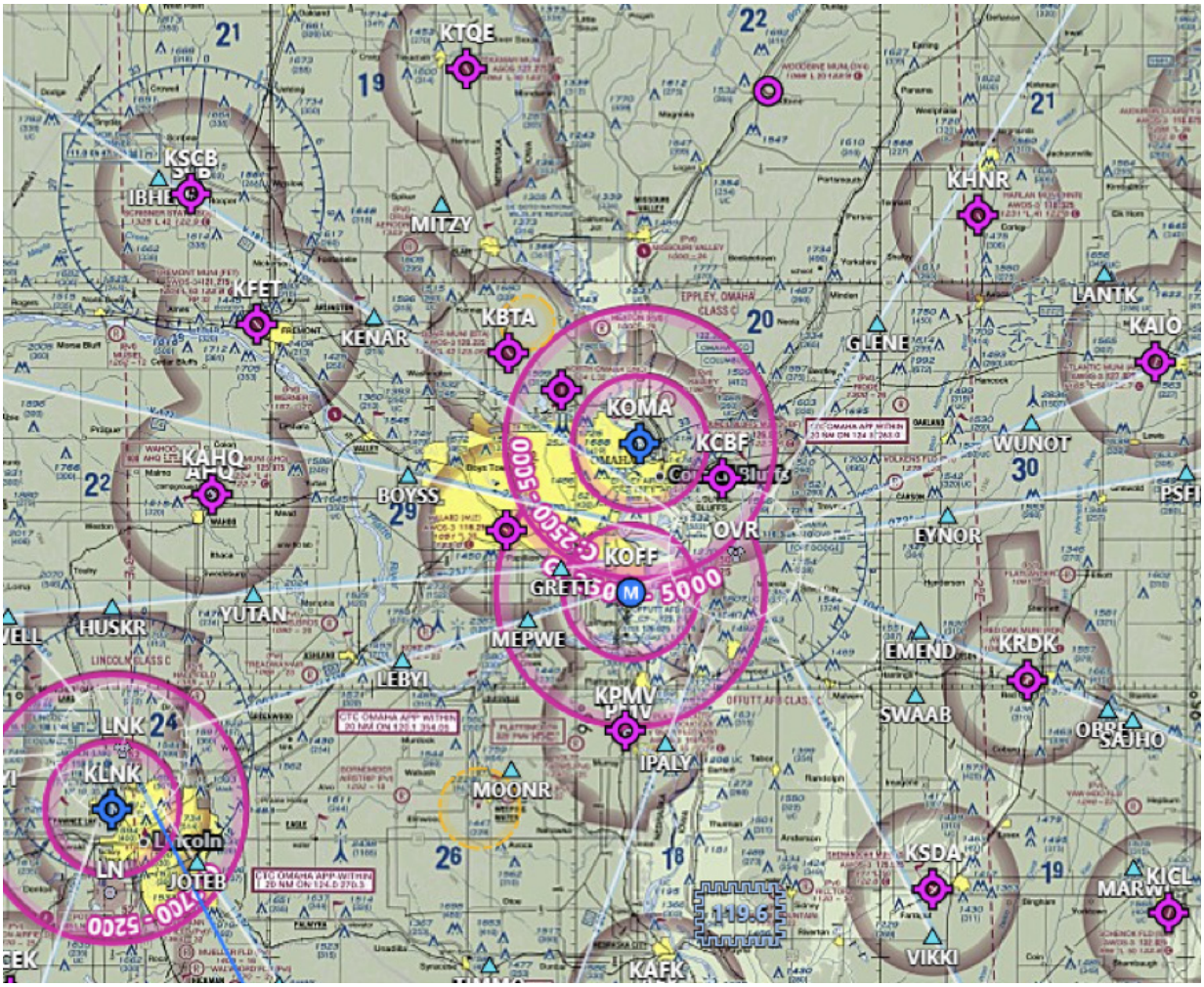
The following airfields are within 10 nm of KOMA and KOFF:

- Millard (KMLE)
- Plattsmouth Airport (KPMV)
- Council Bluffs (KCBF)
- North Omaha (3NO)
- (Private) Ruckl (IA35)
- (Private) Heaton (75NE)
- (Private) Kelley (IA32)

OMAHA, NEBRASKA LOCAL AREA OVERVIEW

Other airfields around Omaha, Nebraska region within 25 nm of Class C airspace include:

- **Red Oak Airport (KRDK)**
- **Shenandoah Airport (KSDA)**
- **Tekamah Airport (KTQE)**
- **Wahoo Airport (KAHQ)**
- **Atlantic Airport (KAIO)**
- **Harlan Airport (KHNR)**
- **Blair Airport (KBTA)**
- **Fremont Airport (KFET)**
- **Nebraska City Airport (KAFK)**



LOCAL TRAINING AREAS FOR GENERAL AVIATION AIRCRAFT NEAR OMAHA, NEBRASKA

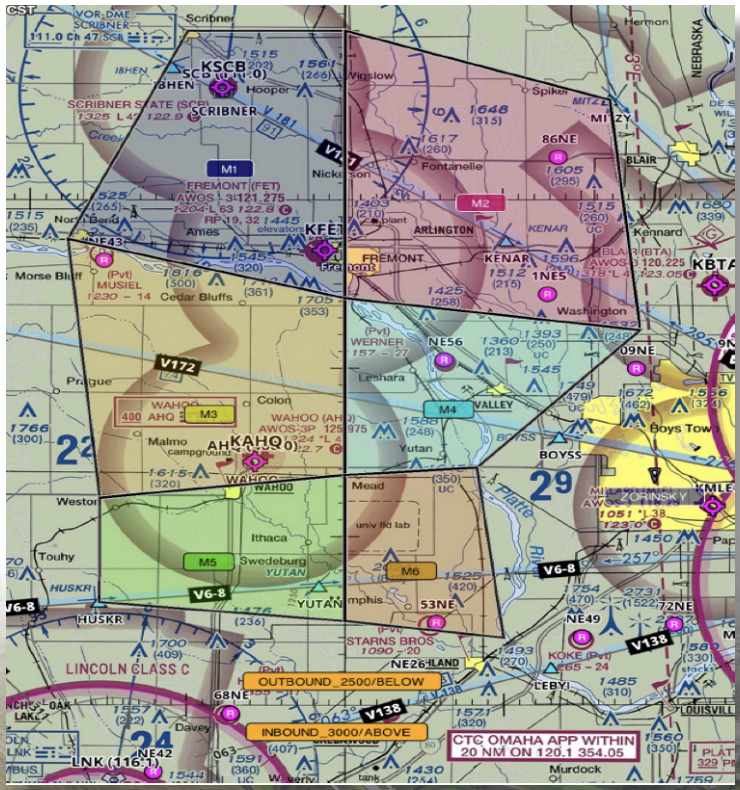
In an effort to decongest air traffic in the Omaha area, Omaha's Terminal Radar Approach Control (TRACON) has provided 3 Letters to Airmen that include instructions for VFR aircraft flying to practice areas near the airports listed:

- Millard Airport (KMLE)
- Plattsmouth Airport (KPMV) and Offutt AFB (KOFF) Aero Club
- Council Bluffs Airport (KCBF)

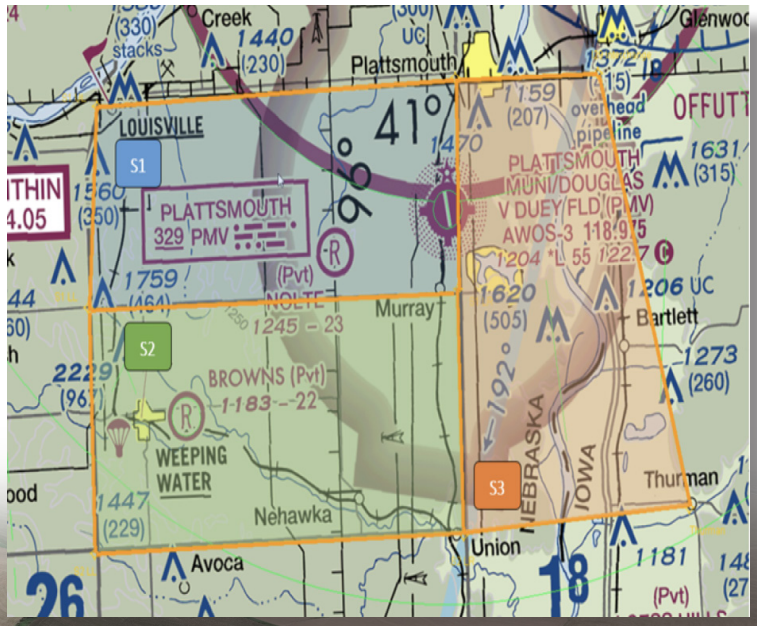
The instructions in these letters are unpublished transition routes and practice areas. These are NOT to be interpreted as protected airspace. The defined areas are not free from obstructions, and it is solely the pilots' responsibility to comply with 14 CFR 91.119 minimum safe altitudes. Images of each Letter to Airmen are included but the full letter can be accessed via the hyperlinks provided under the image.

Millard Airport (KMLE)

https://notams.aim.faa.gov/lta/main/viewlta?look-upid=2793911537541060219



Plattsmouth (KPMV)
https://notams.aim.faa.gov/lta/main/viewlta?look-upid=2725112365589731319



Council Bluffs (KCBF)
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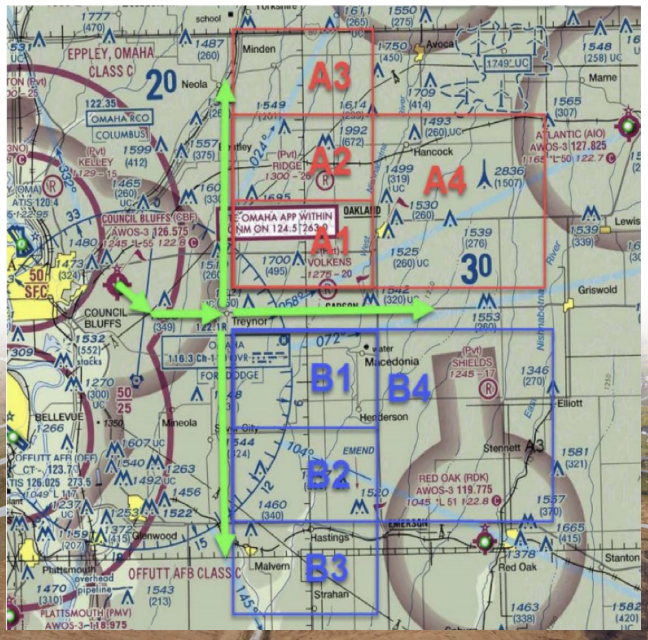
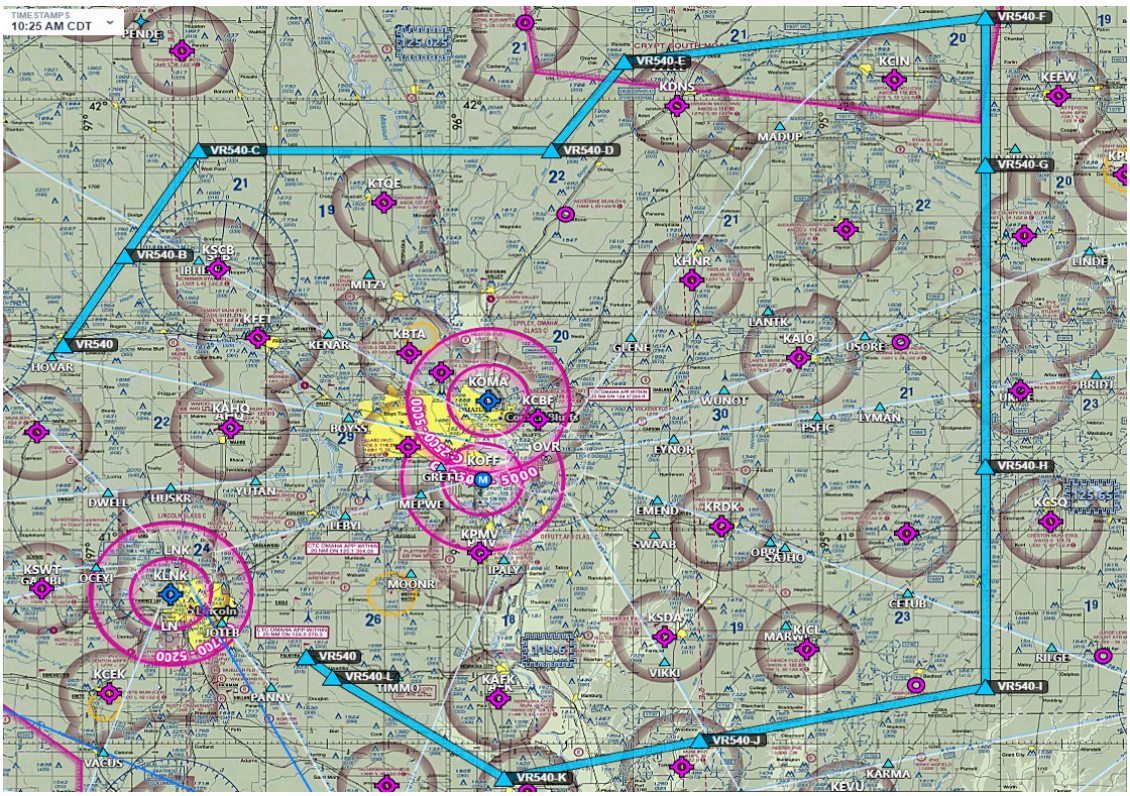


MILITARY TRAINING ROUTES (MTR) NEAR OMAHA, NEBRASKA

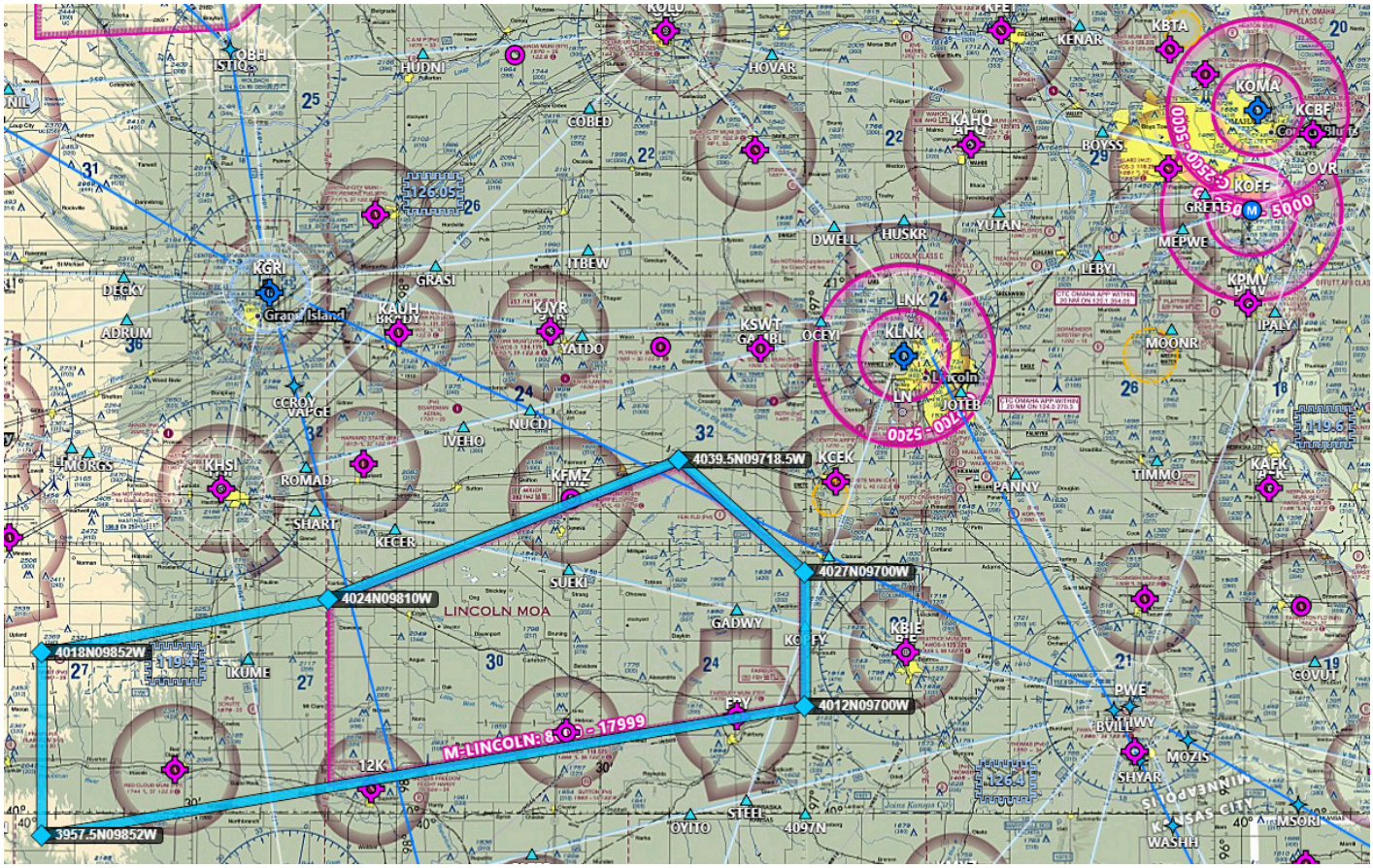
National security depends largely on the deterrent effect of our airborne military forces. To be proficient, the military services must train in a wide range of airborne tactics. One phase of this training involves “low-level” combat tactics. The required maneuvers and high speeds make the see-and-avoid aspect of VFR flight more difficult. Increased vigilance in areas containing such operations is paramount. The Omaha area is home to one of these low-level routes, VR-540 and VR-541 (same route as 540 but opposite direction). This route is owned by the 114th Fighter Wing of the South Dakota Air National Guard, stationed at Joe Foss Field (KFSD). The 114th F-16 aircraft practice tactical low-level formation and ground attack tactics at 500 ft and 500 kts. VR-540/541 are only used during VFR conditions. The figure below depicts the MTR encompassing the Omaha area:



Aircraft: F-16C/D Fighting Falcon (typically 2 or 4 F-16’s in formation)
When: 1000L-1600L (typical)
Altitude: 500 ft AGL
Speed: 500 kts
Weather Requirements: In accordance with VFR, except flight visibility must be 5 miles or more and must not be conducted below a ceiling of less than 3,000 ft AGL.
Notes: NOTAMs are generated no less than two hours prior to VR-540/541 use. At 500 kts, the F-16 formation can be extremely challenging to see.

MTR

MILITARY OPERATIONS AREA (MOA) NEAR OMAHA, NEBRASKA



MOAs are established airspace for the purpose of separating military training activities from IFR traffic. Whenever a MOA is being used, nonparticipating IFR traffic may be cleared through a MOA if IFR s eparation can be provided by ATC. Otherwise, ATC will reroute or restrict non-participating IFR traffic.

Pilots operating under VFR should exercise extreme caution when flying within a MOA when military activity is being conducted. The activity status (active/inactive) of MOAs may change frequently. Therefore, pilots should contact any FSS within 100 nm of the area to obtain accurate real-time information concerning the MOA hours of operation. Prior to entering an active MOA, pilots should contact the controlling agency for traffic advisories.

The only MOA near the Omaha area is the Lincoln MOA (25 nm southwest of Lincoln Airport). It is owned by the 155th Air Refueling Wing of the Nebraska Air National Guard (NE ANG). The Lincoln MOA consists of two parts, Lincoln MOA A (8,000 MSL – FL280) and Lincoln MOA B (FL190-230).

NOTE: Lincoln MOA B is not found on either the U.S. VFR sectional or U.S. IFR low or high charts.

MOA

PARACHUTE JUMPING AREAS (PJA) NEAR OMAHA, NEBRASKA

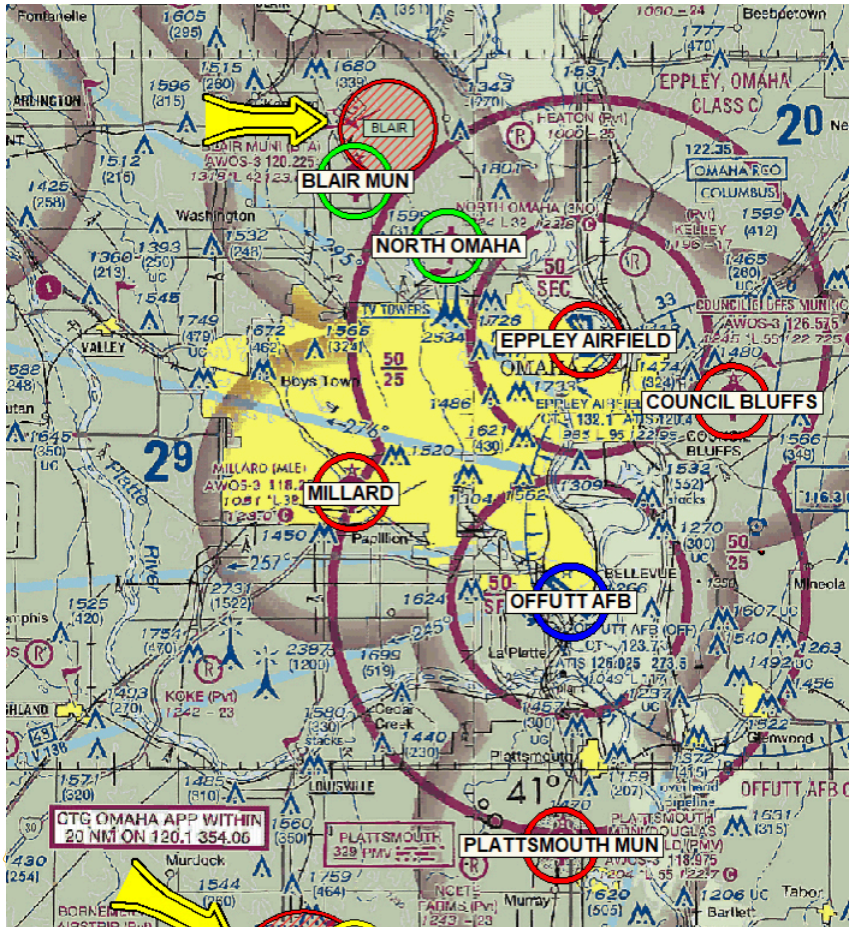
According to the AIM 3-5-4, pilots should make appropriate broadcasts on designated Common Traffic Advisory Frequency (CTAF) and monitor that CTAF until all parachute activity has terminated or the aircraft has left the area. Prior to commencing a jump operation, the pilot should broadcast the aircraft's altitude and position in relation to the airport, the approximate relative time when the jump will commence and terminate and listen to the position reports of other aircraft in the area.

Weeping Water from Browns Pvt Airport

Location: 16 nm Southwest of Offutt AFB (3 nm Radius)
Altitude: 14,000 ft MSL
Time: Sunrise to Sunset +1/2 hour

Blair Municipal (KBTA)

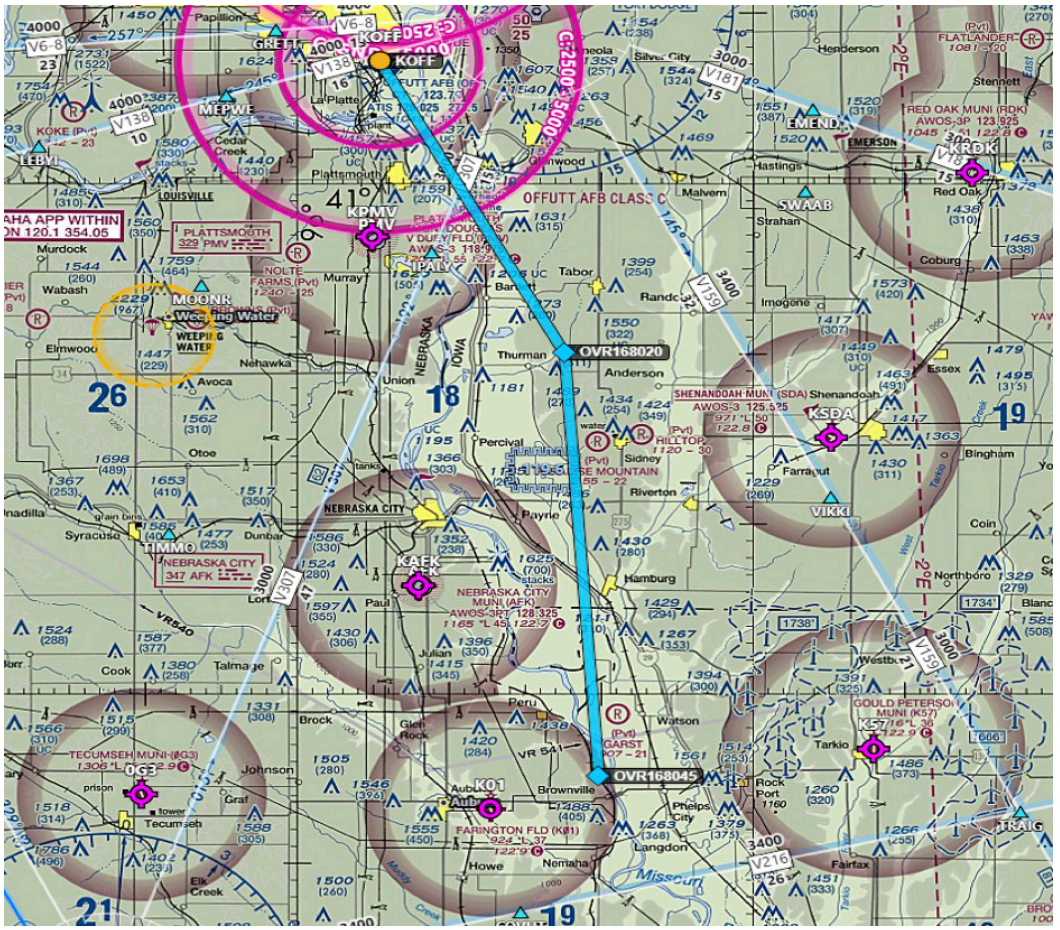
Location: 19 nm Northwest of Offutt AFB (2NM Radius)
Altitude: 14,000 ft MSL
Time: Sunrise to Sunset



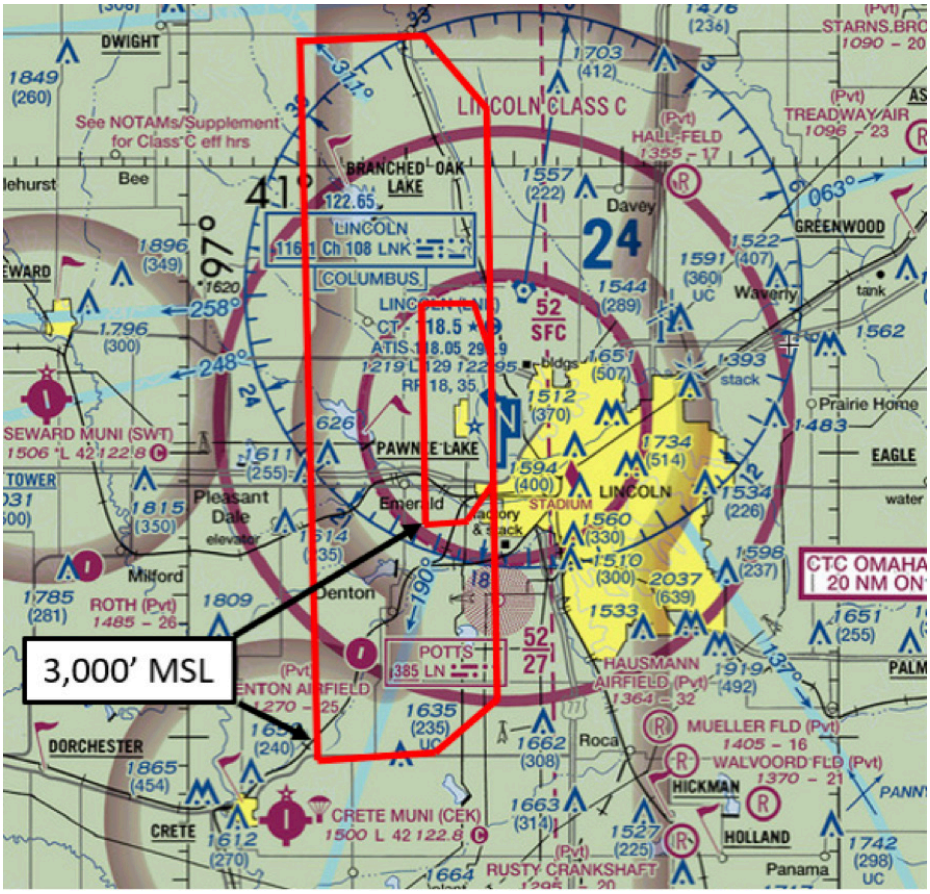
OFFUTT AFB DESIGNATED FUEL DUMP AREA

Heavy aircraft that operate from Offutt have a maximum landing gross weight. Landing above that gross weight could damage the aircraft. Therefore, during an inflight emergency, it is sometimes necessary to dump fuel to reduce gross weight and land as soon as possible. If emergency conditions allow, Offutt aircraft have a designated fuel dump area to hold and jettison fuel. This area is confined to the 168 Radial on the Omaha VORTAC (OVR) between 20 and 45 nm Distance-Measuring Equipment (DME), right hand turns. Fuel jettison altitudes over 20,000 ft AGL are preferred but not guaranteed depending upon the emergency.

During fuel dumping operations, ATC will broadcast, “Attention all aircraft: fuel dumping in progress over (location) at (altitude) by (type aircraft) (flight direction)” immediately and every three minutes thereafter. Upon receipt of such a broadcast, pilots of aircraft affected, which are not on IFR flight plans or special VFR clearances, should clear the area specified in the advisory.



LINCOLN AIRPORT OPERATIONS

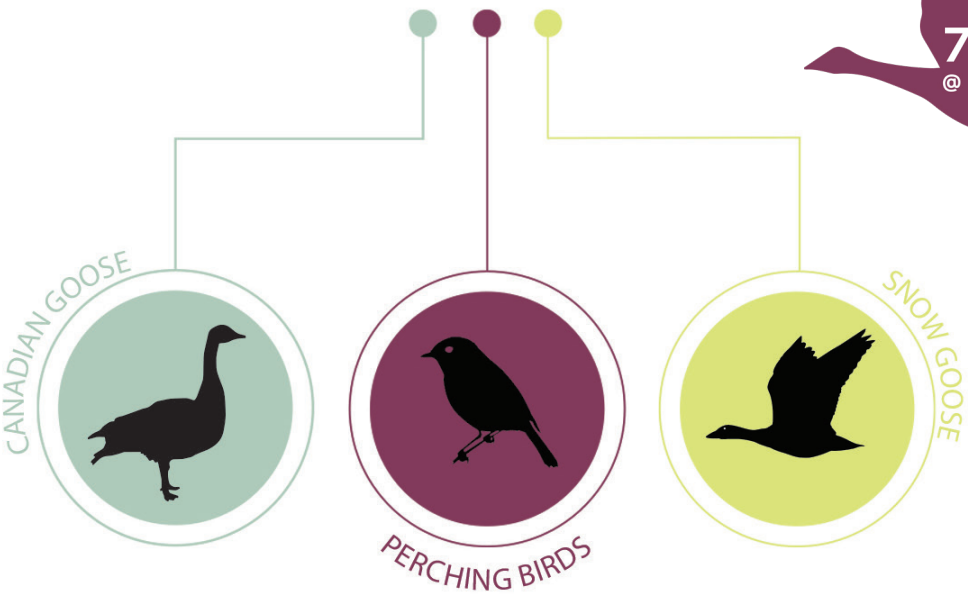


Offutt assigned aircraft, among other military aircraft, frequent Lincoln Airport for training. The close proximity, runway length, and KC-135 Stratotanker presence make the field attractive for pattern work and divert options. It is not uncommon to see two or three C-135's and E-4's in the pattern performing touch and go's anytime of the day. Take note, the VFR pattern altitude is 3,000 ft MSL.

BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD (BASH)

Located off the departure end of Runway 13 (approach end of 31) lies the 113-acre Base Lake that supports thousands of birds annually during migration. An additional threat is the Missouri River located two miles east of the runway and serves as the primary migration route to millions of waterfowl and other migratory birds traveling the Central and Mississippi migratory flyway during the spring and fall migration seasons. Numerous area wildlife refuges also provide excellent stop-over points for the migrating birds. Twenty-five miles north of the base is Desoto National Wildlife Refuge, one of the largest stopover points for Canada and Snow Geese in North America with as many as 700,000 geese on the refuge during the fall/spring migration periods.

Canada and Snow geese, which may fly in flocks of 100,000 birds during the heaviest migration periods, are a serious threat to Offutt's flight operations. The most commonly struck bird order in the Offutt area is perching birds. Although perching birds are relatively small, if encountered in a flock they can pose a high threat to aircraft.



BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD CONTINUED...

On Offutt Air Force Base itself, current drainage schemes and the level of the water table allow for water to collect in open retention ponds on both sides of Runway 30. Continuous efforts are made by the Flight Safety team and USDA/WS representatives to make the field unattractive to the birds and mitigate the risk. In addition, the Flight Safety team uses a Birdstrike Avoidance Radar System (DeTect, Inc.) to track birds in real-time to alleviate potential bird hazards. Be aware that daily and seasonal bird movements create various hazardous conditions when flying in the Omaha area.

Bird strike risk increases during the months of March through April, and August through November due to bird migration. While over 90% of the reported bird strikes occur at or below 3,000 ft AGL, strikes at higher altitudes are common during migration.

Tips to Reduce Bird Strike Risks

- Review emergency procedures (Engine ingestion, windshield strike, etc.) before your flight when operating from airports with known bird hazards or when operating near high bird concentrations.
- When encountering birds enroute, climb to avoid collision, because birds in flocks generally distribute themselves downward, with lead birds being at the highest altitude.
- Avoid overflight of known areas of bird concentration and flying at low altitudes during bird migration. Charted wildlife refuges and other natural areas contain unusually high local concentration of birds which may create a hazard to aircraft.

Reporting Bird Strikes

- Pilots are urged to report any bird or wildlife strike using FAA Form 5200-7, Bird/Other Wildlife Strike Report (Appendix 1).

https://www.faa.gov/airports/airport_safety/wildlife

Reporting Bird and Other Wildlife Activities

- If you observe birds or other animals on or near the runway, request airport management to disperse the wildlife before taking off. Also contract the nearest FAA ARTCC, FSS, or tower regarding large flocks of birds and report the:
  - o Geographic location.
  - o Bird type (geese, ducks, gulls, etc.)
  - o Approximate numbers.
  - o Altitude
  - o Direction of bird flight path.

PROFILE OF MID-AIR COLLISIONS

Studies of the mid-air collision problem conclude that there are definite warning patterns. It may be surprising to some that nearly all mid-air collisions occur during daylight hours and in visual meteorological conditions (VMC). Perhaps not so surprising is that the majority happen within 5 nm of an airport, in the areas of greatest traffic concentrations, and usually on warm weekend afternoons when the airspace is more congested with leisure flyers.

The general aviation pilot is used to avoiding other civilian aircraft, but is usually not used to the much faster closure rates of military aircraft and often does not react soon enough to avoid a potentially dangerous situation. No pilot is immune: 38% of pilots involved had less than 1000 hours of flight time, however experience is not always protective; 25% had more than 5000 hours.

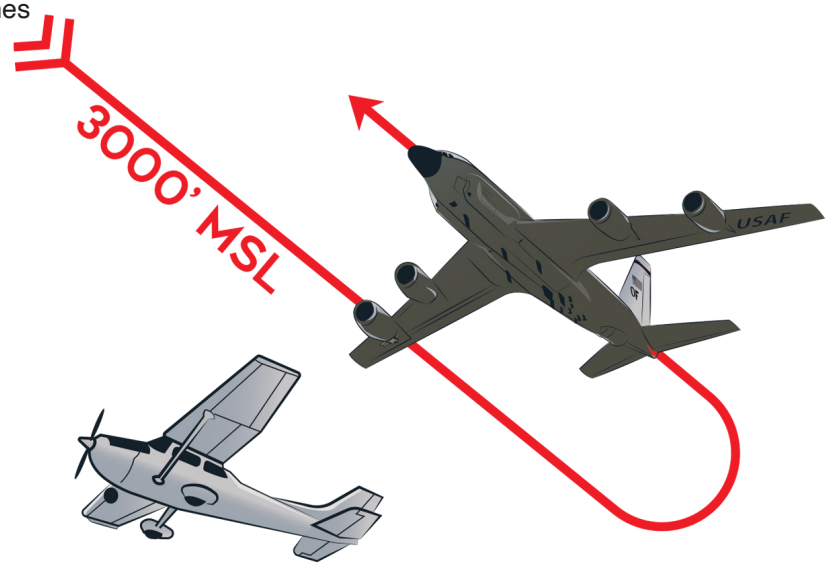
Statistics on in-flight collisions show that 82% were at overtaking convergence angles: 35% were from 0 to 10 degrees – almost straight from behind! Only 5% were from a head-on angle. We must take an active role in reducing the chances of a mid-air collision; no pilot is invulnerable. Stay Alert and Stay Alive!

STATISTICS OF NEAR MID-AIR COLLISIONS (NMAC):

- 75% of NMAC involve General Aviation aircraft
- Nearly 70% occur near airports and 85% occur below 3000' AGL
- Over 50% occur at airfields with towers
- Over 50% involve pilots not using "See and Avoid" techniques
- 90% of aircraft involved are small light airplanes

STATISTICS OF ACTUAL MID-AIR COLLISIONS (MAC):

- Less than 10% occur when both aircraft are in radar contact
- Nearly 100% take place during day VMC
- 67% of mid-air collision reports say visibility was greater than 10 miles
- 40% occur during cruise flight
- 20% involve an aircraft where flight instruction is taking place
- 95% of aircraft involved are small light airplanes



Data Sources:

FAA Aviation Safety Program publication P-8740-51
Kunzi, F. & Hansman, R. (2011) Mid-Air Collision Risk and Areas of High Benefit for Traffic Alerting
Taneja, N. and Wiegmann, D. (2001) Analysis of Mid-Air Collisions in Civil Aviation

ACCIDENT CAUSE FACTORS

TOP 10

1. **Inadequate preflight preparation and/or planning.**
2. **Failure to obtain and/or maintain flying speed.**
3. **Failure to maintain direction control.**
4. **Improper level off.**
5. **Mismanagement of fuel**
6. **Failure to see and avoid objects or obstructions**
7. **Improper inflight decisions or planning.**
8. **Misjudgment of distance and speed.**
9. **Selection of unsuitable terrain.**
10. **Improper operation of flight controls.**

This list points out the need for continued refresher training to establish a higher level of flight proficiency for all pilots. A part of the FAA's continuing effort to promote increased aviation safety is the Aviation Safety Program. For information on Aviation Safety Program activities contact your nearest Flight Standards District Office.

ALERTNESS. Do not be a victim of complacency, especially when the weather is good. Statistics show that air collisions most often occur under ideal weather conditions. Unlimited visibility appears to encourage a sense of security.

GIVING WAY. If you think another aircraft is too close to you, give way instead of waiting for the other pilot to respect the right-of-way to which you may be entitled.

COLLISION AVOIDANCE STRATEGY

Statistics indicate most mid-air collisions occur during daylight hours in VFR weather conditions, at lower altitudes (5000 ft AGL or less), and within five nm of an airport. These are the times, locations, and conditions in which the heaviest flying activity occurs. Here are some tips that should always be reviewed before every flight:

1. **KNOW HOW TO CLEAR**. The best scan patterns involve dividing the windscreen into separate segments and allowing your eyes to clear each segment before moving onto the next. Utilize wing rocks to clear blind spots. Use points of reference to approximate distance from traffic to help your eyes adjust to the proper focal range and then try to resume the traffic search if you can't see the traffic. Request traffic updates if you think the traffic will be a conflict. Traffic on a collision course is hard to see because it does not move in the windscreen. Finally, use your radios by listening to position reports and clear appropriately.

2. **MISSION PLAN POTENTIAL CONFLICTS.** Review locations of military airfields, MOAs, low level routes, and alert areas. Plan your flight to avoid potential conflicts to the greatest extent possible. Fly the correct altitude for direction of flight and lastly. Review the airfield layout and ground references associated with the destination—this will help you locate aircraft making position reports at that airfield.

3. **USE ALL AVAILABLE RADAR SERVICES.** When operating in controlled airspace, it is an excellent idea to request VFR flight following for traffic advisories, even when not in radar contact. Transponder equipped aircraft should always set the appropriate codes. Ensure the altitude-encoding (Mode C) feature is on and operable. Some aircraft have TCAS (Traffic Collision Avoidance System) equipment which allows other aircraft monitor your position and avoid you, but only if your transponder is on and operable.

4. **PRIORITIZE COCKPIT DUTIES AND STAY ALERT.** Review inflight materials as much as possible on the ground. If you need to review materials inflight, hold them just below the glareshield so the periphery of your vision remains outside which will minimize "heads down" syndrome. Prioritize your cockpit duties: maintain aircraft control and clear FIRST! Everything else is secondary.

5. **"SEE AND AVOID"** procedures are critical for all traffic. Whenever you are not in actual IMC weather conditions, it is everyone's responsibility to clear aggressively, regardless of the type of flight plan you are on or the class of airspace you are flying in.

REPORTING NEAR COLLISIONS

1. **Purpose and Data Uses.** The primary purpose of the Near Mid-air Collision (NMAC) Reporting Program is to provide information for use in enhancing the safety and efficiency of the National Airspace System.

2. **Definition.** A near mid-air collision is defined as an incident associated with the operation of an aircraft in which a possibility of collision occurs as a result of proximity of less than 500 ft to another aircraft, or a report is received from a pilot or a flight crew member stating that a collision hazard existed between two or more aircraft.

3. **Reporting Responsibility.** It is the responsibility of the pilot and/or flight crew to determine whether a near mid-air collision occurred and, if so, to initiate a NMAC report. Be specific, as ATC will not interpret a casual remark to mean that a NMAC is being reported. The pilot should state, “I wish to report a near midair collision.”

4. **Where to File Reports.** Pilots and/or flight crew members involved in NMAC occurrences are urged to report each incident immediately:
   - By radio or telephone to the nearest FAA ATC facility or FSS.
   - In writing, in lieu of the above, to the nearest Flight Standards District Office (FSDO).

ITEMS TO BE REPORTED.

1. Date and time (UTC) of incident.
2. Location of incident and altitude.
3. Identification and type of reporting aircraft, aircrew destination, name and home base of pilot.
4. Identification and type of other aircraft, aircrew destination, name and home base of pilot.
5. Type of flight plans; station altimeter setting used.
6. Detailed weather conditions at altitude or flight level.
7. Approximate courses of both aircraft: indicate if one or both aircraft were climbing or descending.
8. Reported separation in distance at first sighting, proximity at closest point horizontally and vertically, and length of time in sight prior to evasive action.
9. Degree of evasive action taken, if any (from both aircraft, if possible).

VISION IN FLIGHT

Eyesight is essential to avoiding other aircraft, yet our eyes have limitations too. Being aware of these limitations will improve the ability to see and avoid. The following is a brief discussion of some factors affecting our vision.

1. SPACE MYOPIA: At high altitudes, without objects to focus on, (horizon, clouds, etc.) the eyes tend to focus on the windscreen or just outside the cockpit, reducing the sighting distances. Shifting your gaze f requently to instrument panel, ground features, distant objects (if available), etc. will help overcome this factor.

2. FIXATION: Avoid the tendency for fixation. Scan in sectors, shifting your gaze vertically and horizontally; practice focusing on objects of known or accurately estimable distances when available.

3. FOCUSING: The time required for the eyes to change focus from one object to another is at least 2.5 seconds--for example the time it takes to change focus from the instrument panel to outside the aircraft. This time increases with fatigue and age.

4. CONTRAST: Contrast of objects is important in avoiding other aircraft. Sky conditions on many occasions make it more difficult to detect another aircraft, especially during periods of low-light illumination.

5. HYPOXIA: Hypoxia affects the ability of the eyes to detect distant objects, especially at night. Due to the lack of oxygen in the blood, the eyes suffer a loss of acuity and have difficulty in focusing. Smokers must be especially aware of this factor.

6. LACK OF RELATIVE MOTION: This factor is one of the more dangerous ones because aircraft that are on a collision course have no relative motion. When there is a lack of motion, more time is required to detect and identify other aircraft.

7. NEARSIGHTEDNESS: The normal eye with 20/20 vision can detect an aircraft with a fuselage diameter of 7 feet from about 4 miles away. If you are nearsighted (myopic), you will not be able to see the aircraft until it is closer. How close depends on how nearsighted you are. The more severe the myopia, the closer the aircraft must be before it is detected. For safety's sake, please wear your prescription glasses.

8. SCANNING: Where and how you look is important too. There is no scan that works best for all pilots. The most important thing is for each pilot to develop and USE a scan that is usable for them--in their own aircraft. One of the best techniques in scanning is to scan in sectors, both vertically and horizontally.

9. BLIND SPOT: The human eye has a blind spot where the optic nerve attaches to the retina in the back of the eye. The location of the blind spot for most people is about 30 degrees right of center. With both eyes unobstructed, the peripheral vision of one eye cancels out the blind spot on the other eye. However, a windshield post, a large, smashed bug or other obstruction to your vision could negate how your brain compensates for your blind spot.

VISION IN FLIGHT

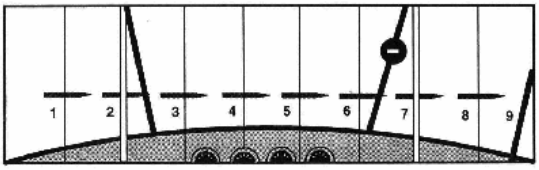
Cover or close your right eye and focus your left eye on the cross. Move the diagram toward you until the square disappears.

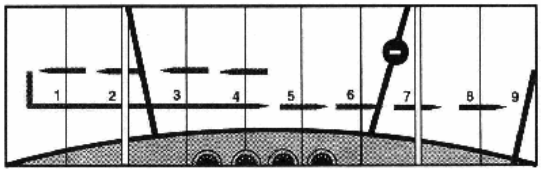
To try this on your right eye, turn the diagram upside down.

SCAN PATTERN: 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.





WAKE TURBULENCE

Wake turbulence is a vortex created by any wing producing lift. The vortex trails the wing tips and spreads outwards and downwards. All aircraft produce some degree of wake turbulence. During one test, vortex velocities were recorded at 300 ftper second (approximately 180 kts). The greatest vortex occurs when the generating aircraft is heavy, clean (flaps and gear retracted), and slow. Here are some rules of thumb for avoiding wake turbulence:

Cruise Flight: During cruise, avoid flying directly behind and below other aircraft. Flight tests have shown that the vortices from heavy jets start to sink immediately at about 400-500 ft per minute. They then tend to level off about 800-900 feet below the generating aircraft's flight path and can remain as far as 10 nm behind a heavy aircraft flying at slow to moderate speed (such as in IFR holding patterns).

Traffic Pattern: During landing, if able, fly your approach glide path above the heavy aircraft's and land beyond the point where the aircraft lowers its nose to the runway. During takeoff, liftoff before the rotation point of the heavy aircraft and climb above its flight path. Allow adequate time separation between yourself and the aircraft in front of you, even if traveling perpendicular to its flight path.

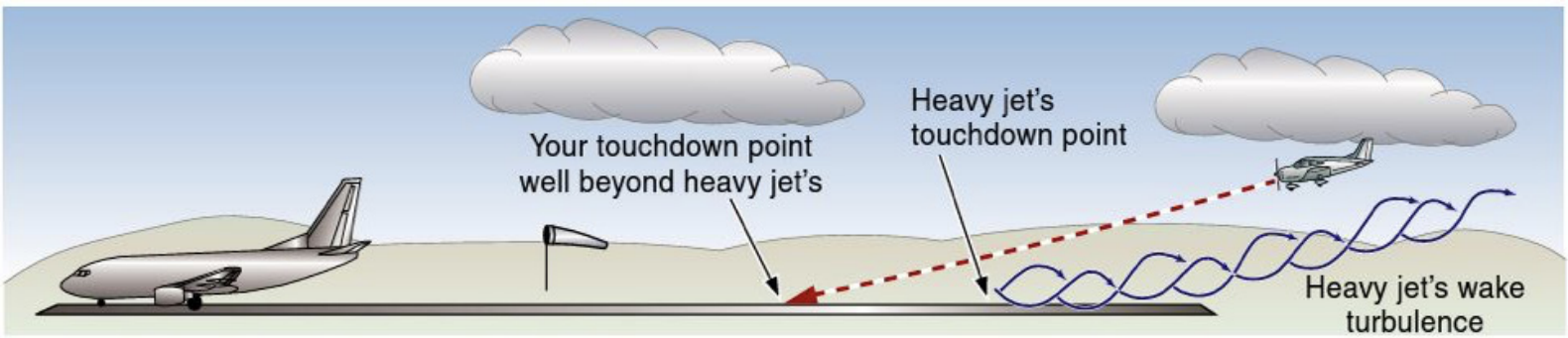
All C-135 variants, the E-4B, and E-6B are designated as a "Heavy" aircraft. The following time and distance intervals, as suggested by the Aeronautical Information Manual, should be maintained to ensure safe flight:

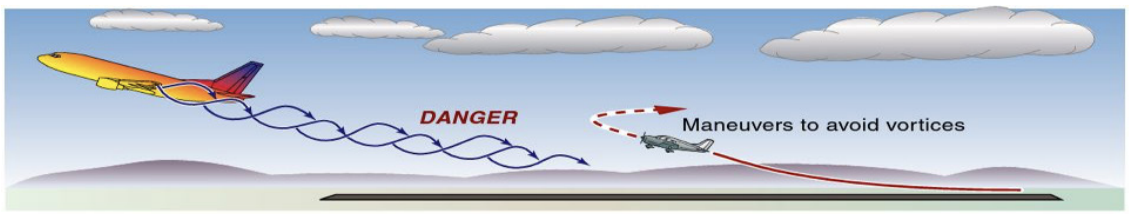
A. Takeoff behind a heavy from the same threshold or on a crossing runway where projected flight paths will cross is two minutes.

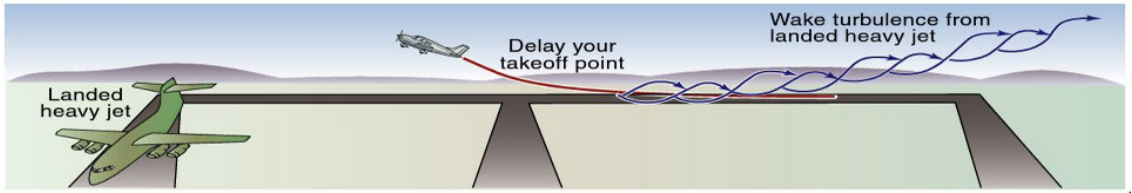
B. Takeoff behind a heavy from an intersection of the same runway or in the opposite direction on the same runway is three minutes.

C. When operating directly behind a heavy jet at the same altitude or less than 1000' below: small/large aircraft behind a heavy jet – five miles separation.

D. During the landing, small aircraft landing behind a heavy jet – six miles separation.







FEDERAL LAW & GUIDANCE FOR SMALL UNMANNED AERIAL SYSTEMS (SUAS)

OFFUTT AFB INFORMATION

Offutt AFB is a NO DRONE ZONE. Flying drones over the following areas is PROHIBITED:

- Offutt AFB
- Capehart Chapel
- Rising View housing area
- Ehrling Berquist Clinic
- Offutt Air Force Base Lake

Anyone who wishes to request permission to operate commercial sUAS on Offutt property must meet certain requirements and get approval from the Wing Commander. This includes, but is not limited to, certifying and registering the sUAS, following federal requirements, and contacting 55th Wing Security Forces Technologies Section at 402-294-2433.

Commercial and government sUAS operators should note that an FAA waiver must be approved 90 days prior to sUAS utilization on Offutt main base.

FAA Waiver Form Link:
https://www.faa.gov/uas/commercial_operators/part_107_waivers

For additional information, please contact the 55th Wing Public Affairs office at (402) 294-3663.

GENERAL INFORMATION

In addition to the drone prohibitions above, federal laws and guidelines are provided for operators of UAS:

- All UAS over 0.55 LBS must be registered with the FAA and properly labeled before flight.
- Always operate UAS within visual sight
- Contact the airport or air traffic control tower if within five nm of an airport
- Operate UAS no higher than 400 feet and remain below surrounding obstacles
- Do not fly in adverse weather conditions such as high winds or reduced visibility
- Never fly near emergency response efforts
- Never fly over stadiums or sporting events
- Do not fly under the influence of alcohol or drugs
- Must remain clear, and yield to all manned aircraft operations
- Do not fly near or over sensitive infrastructure (e.g., power stations, correctional facilities)
- Do not fly a UAS if it has not been registered with the FAA and properly labeled
- Do not fly over people
- Do not fly in national parks

FEDERAL LAW & GUIDANCE FOR SMALL UNMANNED AERIAL SYSTEMS (SUAS)

Flying Near Airports
Drone operators should avoid flying near airports because it is difficult for manned aircraft to see and avoid a drone while flying. Remember that drone operators must avoid manned aircraft and are responsible for any safety hazard their drone creates in an airport environment.

Airports in Controlled Airspace
For flight near airports in controlled airspace, drone operators must receive an airspace authorization prior to operation. Airspace authorizations come with altitude limitations and may include other operational provisions. Controlled airspace and other flying restrictions can be found on our B4UFLY app.

Flight at Fixed Sites
Some recreational flyer fixed sites have written agreements with the FAA that authorize flight in controlled airspace at certain altitudes. Many of these agreements include additional operational provisions. Contact the fixed site operator to learn more about the requirements for that location.

Airports in Uncontrolled Airspace
For flights near airports in uncontrolled airspace that remain under 400 ft above the ground, prior authorization is not required. When flying in these areas, remote pilots and recreational flyers must be aware of and avoid traffic patterns and takeoff and landing areas. A drone must not interfere with operations at the airport must yield right-of-way to all other aircraft. Uncontrolled airspace and other flying restrictions can be found on our B4UFLY app.

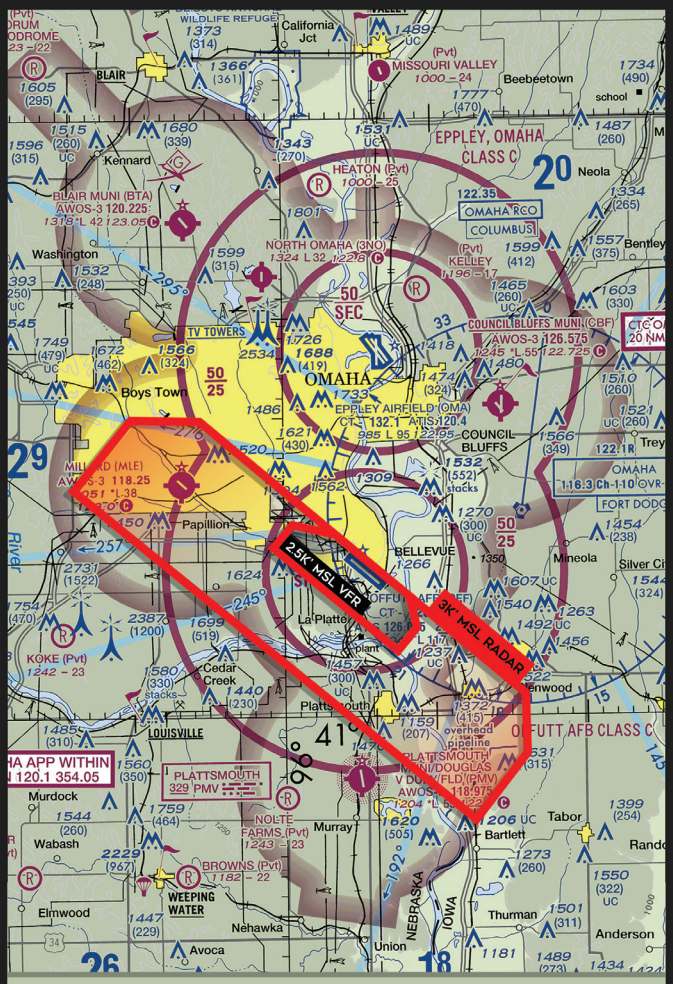
B4UFLY App
Recreational users who only fly their drone for fun, now have an improved app – B4UFLY – to help show where they can and cannot fly with interactive maps. The FAA has partnered with Aloft (formerly Kittyhawk) to redevelop the FAA's first mobile application, to improve the user experience so that recreational flyers know whether it is safe to fly their drone. The app provides situational awareness to recreational flyers and other drone users. It does not allow users to obtain airspace authorizations to fly in controlled airspace, which are only available through the FAA's Low Altitude Authorization and Notification Capability (LAANC).

The B4UFLY app is available to download for free at the App Store for iOS and Google Play store for Android.

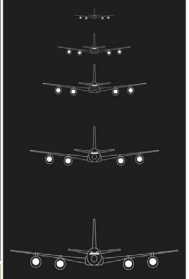
Key features include:

- **A clear "status" indicator that informs the operator whether it is safe to fly or not. (For example, it shows flying in the Special Flight Rules Area around Washington, D.C. is prohibited.)**
- **Informative, interactive maps with filtering options.**
- **Information about controlled airspace, special use airspace, critical infrastructure, airports, national parks, military training routes and temporary flight restrictions.**
- **The ability to check whether it is safe to fly in different locations by searching for a location or moving the location pin.**

OFFUTT AFB
MID AIR COLLISION AVOIDANCE
MACA



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 MILES	6	18
0.5 MILES	3	9



BOEING E-4B

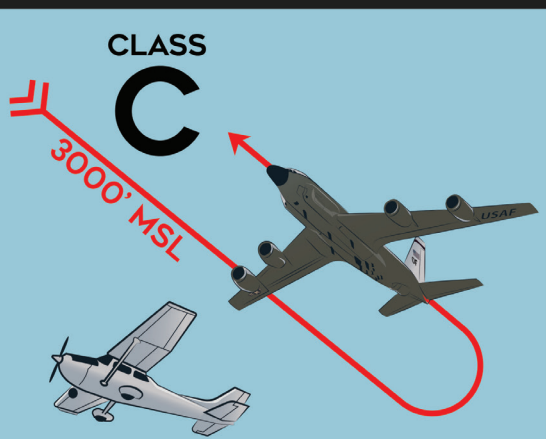
BOEING RC-135

Danger Areas based on recognition and reaction time.

55th Wing Flight Safety
402-294-3404

Omaha Approach
402-682-4343

55th Wing Flight Safety available for pilot safety briefings.



Traffic Conflict Scenario for local airports: Millard and Plattsmouth contact Omaha Approach 120.1 or 125.4 (Millard Ground).