Mid Air Collision

509TH BOMB WING
WHITEMAN AFB, MO

0PR: 509/131 BW
Flight Safety Office
(660) 687-7410
DSN: 975-7410

442 FIGHTER WING
Flight Safety Office
(660)-687-3715
DSN: 975-3715

WHITEMAN AFB, MO

FIELD INFORMATION

FIELD ELEVATION	871 FT
RUNWAY	01/19
LENGTH AND WIDTH	12,400 X 200

FIELD LIGHTING

High Intensity Runway Lights (HIRLs)	
Precision Approach Path Indicators	(PAPIs)
Sequences Flashing Lights	(SFL)
CAT 1 Approach Lights	(ALSF-1)

NAVIGATIONAL AIDS

CIVIL AIRCRAFT CAN RECEIVE DME OFF
SZL TACAN ON 109.8

TACAN	(SZL)	CHANNEL 35X	109.8
ILS RWY 01	(ISZL)		110.3
ILS RWY 19	(IMXJ)		108.5

*MACA Pamphlet updated August 2024

WAKE TURBULENCE INTRODUCTION:

All aircraft generate wake turbulence while in flight. Originally believed to be "prop wash," it was later discovered to be a pair of counter-rotating vortices trailing from the wing tips. As aircraft became larger and heavier, the intensity of the vortices began to pose problems for smaller aircraft. Some of today's jet aircraft, and in particular the new (civil and military) jumbo jets, generate vortices with roll velocities exceeding the roll control capability of some aircraft. Further, turbulence generated within the vortices can damage aircraft equipment if encountered at close range. The pilot's must learn to envision the location of vortex wake generated by large aircraft and adjust their flight path accordingly.

VORTEX STRENGTH: The strength of the vortex is governed primarily by the weight, speed, and shape of the wing of the generating aircraft. The basic factor is weight, and the vortex strength increases with weight and span loading. During tests, vortex strength tangential velocities were recorded at 150' per second, or about 90 knots. The greatest vortex occurs when the generating aircraft is HEAVY, CLEAN and SLOW.

INDUCED ROLL: A serious encounter could result in structural damage. However, the primary hazard is loss of control because of induced roll. Aircraft intentionally flown up the core of a vortex during flight tests tended to roll with that vortex.

VORTEX CHARACTERISTICS: Trailing vortex wake has certain characteristics which a pilot can use in visualizing the location and avoiding it.

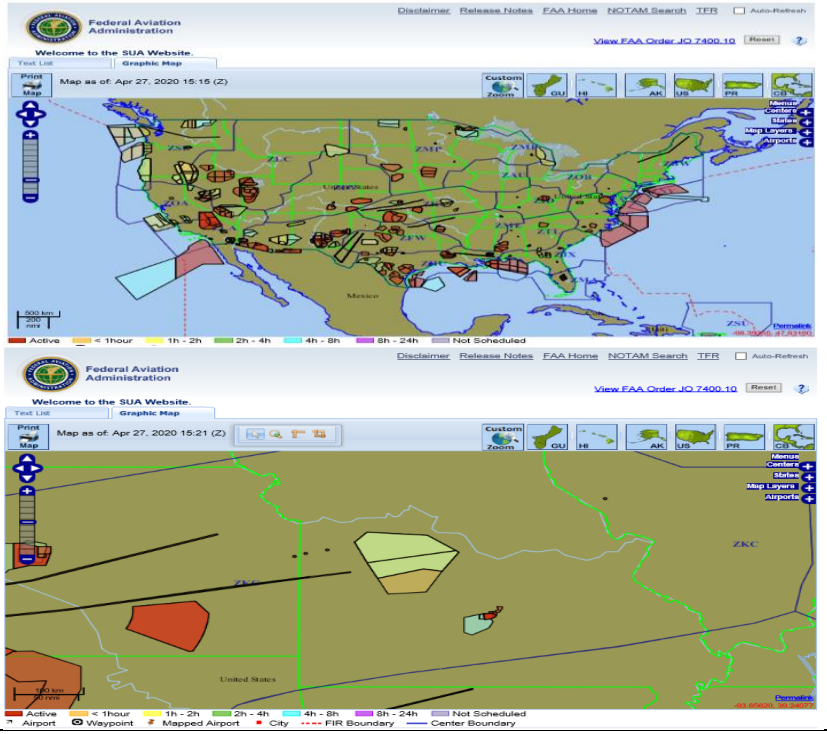
1. Vortex generation starts with the rotation when the nose wheel lifts oft, and ends when the nose wheel touches down on landing. Pilots should note touchdown point of proceeding aircraft.
2. Vortex circulation is outward, upward and around the wing tip when viewed from ahead or behind the aircraft. Tests with heavy aircraft have shown that the diameter of the vortex core ranges from 25 to 50 feet, but the field of influence is larger. The vortices stay close together until dissipation.
3. Flight tests have shown the vortices from heavy jets start to sink immediately at about 400 to 500 feet per minute. They tend to level off about 800 to 900 feet below the generating aircraft's flight path. Vortex strength diminishes with time and distance behind the generating aircraft. Atmospheric turbulence hastens breakup. Residual choppiness remains after vortex breakup as much as 10 miles behind a heavy aircraft flying at slow to moderate speed.
4. When the vortices sink into ground effect. They tend to move laterally outward over the ground at a speed of about 5 knots. A crosswind component will decrease the lateral movement component of the upwind vortex and increase the movement of the downwind vortex. This may result in the upwind vortex remaining in touchdown zone or hasten the drift of the downwind vortex toward a parallel runway.

DON'T FLY BLIND!

sua.faa.gov

Avoid midair collisions through proper flight planning

Go to sua.faa.gov for information on Special Use Airspace (SUA) & Air Traffic Control Assigned Airspace (ATCAA)



Mid-Air Collision and Avoidance (MACA) has increasingly become an important topic within both the military and civilian community. The purpose of this pamphlet is to inform you about the Whiteman AFB area so that you will be able to recognize and avoid mid-air collision hazards.

Whiteman AFB has an extensive amount of both fixed wing and rotor aircraft traffic. There are 20 B-2 Spirit bombers, 26 A-10 Thunderbolt attack aircraft, 14 T-38 Talon training aircraft, and 14 AH-64 Missouri Army National Guard helicopters based here. The high density and volume of operations poses hazards to all aircraft operators, both military and civilian. We attempt to mitigate the hazards in two ways. The first is this program. The MACA program has raised the awareness of all pilots concerning operating in Whiteman's airspace by visiting local airports to present the program to users. The 509th Bomb Wing Flight Safety Office publishes this pamphlet in order to get collision avoidance information to the flying community. The second way the USAF mitigates risk is to encourage all pilots transiting Whiteman airspace to use the services offered by Whiteman Approach control and Tower. The radar approach control facility has approximately 4,200 square miles of airspace up to 9,000 feet as well as the Truman Military Operating Area when the MOA is active.

To aid you in seeing and avoiding military traffic in the Whiteman area, we have included information on locally-based aircraft, military operations and other helpful tips and information. Listed airspeeds are in knots indicated airspeed (KIAS).

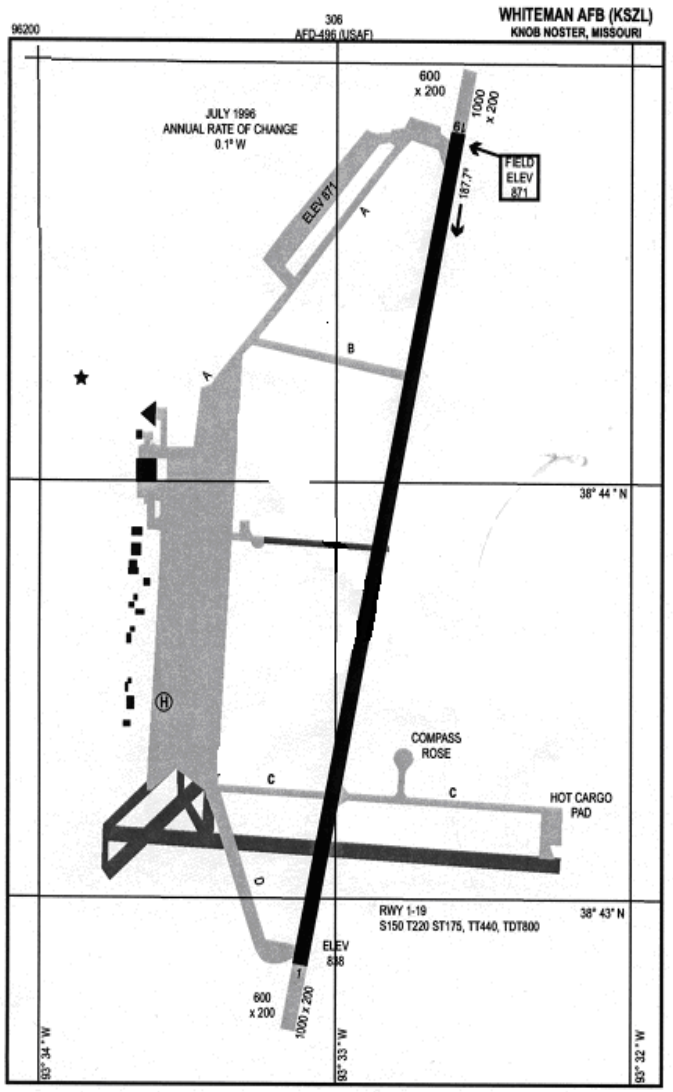
Please visit our webpage for more information:
http://www.whiteman.af.mil/units/safety/index.shtml

COMMUNICATIONS CARD
WHITEMAN AFB, MO (SZL)

WHITEMAN APP CONTROL	127.45 / 284.0
WHITEMAN TOWER	132.4 / 318.8
WHITEMAN ATIS	118.72 / 239.025
WHITEMAN GND CONTROL	128.275 / 275.8

SATELLITE AIRPORTS	COMM	DIRECTION FROM SZL
SKY HAVEN (RCM)	123.0	WNW
SEDALIA (DMO)	122.8	E
HIGGINSVILLE (HIG)	122.8	NNW
LINCOLN(0R2)	122.9	SSE
CLINTON (GLY)	122.8	SSW
WARSAW (RAW)	122.9	SSE
MARSHALL (MHL)	122.8	NE
TRUMAN (2M1)	122.8	NW
LEXINGTON (4K3)	122.7	NNW
E KANSAS (3GV)	122.8	WNW
CARROLLTON (K26)	122.9	N
OTTEN (3VS)	122.8	ESE
LAWRENCE (LRY)	123.0	W
SLATER (9K5)	122.9	NE
LEE'S SUMMIT (LXT)	122.8	WNW
JESSE VIERTEL (VER)	122.7	ENE

AIRPORT DIAGRAM



No pilot is invulnerable to an in-flight collision. The most important guard against such mishaps is to know the limitation of the eye and how to scan effectively for other traffic.

LIMITATIONS OF THE HUMAN EYE: Nearly all midair collisions occur during the day in VFR conditions. The majority happen within five miles of an airport, on warm weekend afternoons. 77% of all midair collisions occur at or below 3,000 feet in the traffic patterns, primarily on final. Enroute mid-airs are most likely to happen at or below 8,000 feet within 25 miles of an airport. Cause of mid air collisions? Failure to SEE AND AVOID. In most cases at least one of the pilots involved could have seen the other in time to avoid contact, if he had just been using his eyes properly. We can "see" and identify only what the mind lets us see. A daydreaming pilot staring into space will not see approaching traffic.

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

EMPTY FIELD MYOPIA: If there is little or nothing to focus on, the eye does not focus at all. We stare but see nothing.

BINOCULAR VISION: If an object is visible to one eye but hidden from view from the other by a windshield post or another obstruction, the total image is blurred and not always acceptable to the mind.

TUNNEL VISION: Our eyes accept light rays from an arc of nearly 200 degrees but are limited to approximately 10-15 degrees in which they can actually focus and classify an object.

BLOSSOM EFFECT: At a distance an aircraft on a collision course will appear to be motionless. It will remain in a seemingly stationary position not growing in size until suddenly the airplane "blossoms" into a huge mass filling one of your windows.

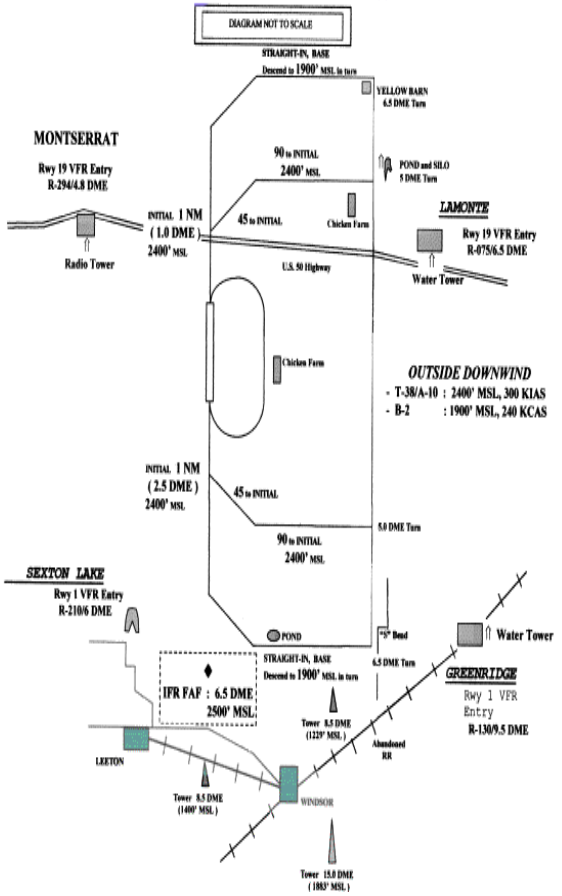
Report Hazards

If you detect or experience a potentially hazardous situation or procedure, let somebody know about it. In the Air Force we use a Hazardous Air Traffic Report to initiate an investigation. There are similar avenues in the civilian world to correct hazards. Please feel free to contact the 509th Bomb Wing Safety Office if you need assistance. Let's fix the problem before someone gets hurt.

If you experience a near mid-air collision, report it. 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 flying within less than 500 feet of another aircraft, or when an aircrew judges that a collision hazard existed between two or more aircraft. You have experienced a near mid-air collision if you took evasive action to avoid a collision, or would have taken evasive action if circumstances had allowed.

The pilot in command determines whether or not a near mid-air collision occurred, and has the responsibility to report it. Immediately after a near mid-air collision, be specific when talking to the ATC controller and inform him or her that you wish to report a near mid-air collision. In that way, the records can be preserved to help find out what happened and why it happened. Civilian pilots should report immediately, or as soon as possible, to a FAA ATC facility or Flight Service Station. Military pilots should inform ATC immediately and file a report with their flight safety office. Remember that the purpose of reporting and investigating near mid-air collisions is mishap prevention.

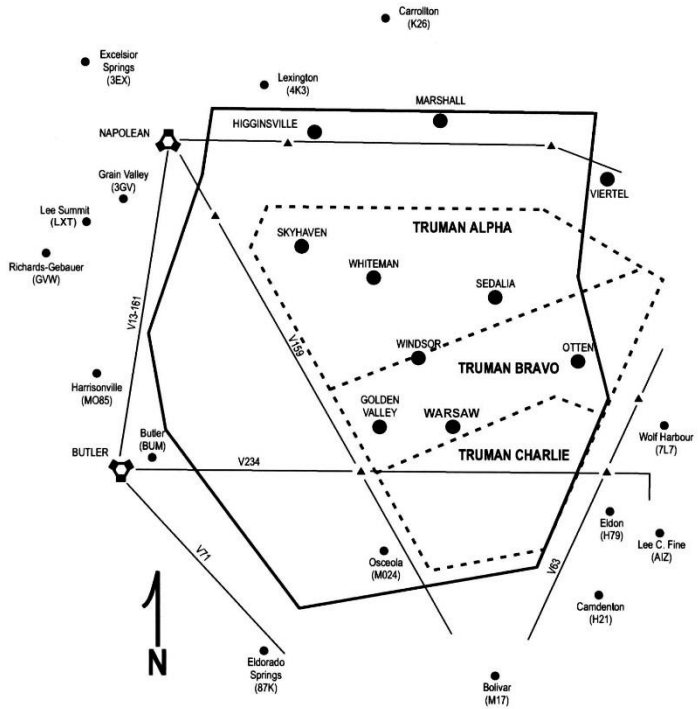
T-38/A-10 Maintain 300 knots in the pattern
B-2 Maintains 230 knots in the pattern



- Standard T-38/A-10 overhead pattern is 2400' MSL
- Standard T-38/A-10 straight-in pattern 1900'MSL
- B-2 VFR pattern is 1900' MSL
- Standard Breakout RADAR Pattern: When aircraft are outside of the Class Delta, RAPCON will issue "(ACID) FLY HEADING TWO SEVEN ZERO, CLIMB AND MAINTAIN FOUR THOUSAND".
- Standard Breakout Tower Pattern: Locally assigned T-38's/A-10's climb straight ahead to 2900'MSL, advise tower and exit the pattern to the East. Class D airspace is 6.5 NM up to 3400' MSL. Requirements for the airspace are prior two-way communications with the tower and a minimum of student pilot certificate.

❖ Traffic advisories will be reported as ATC workload permits.

WHITEMAN APPROACH CONTROL AIRSPACE

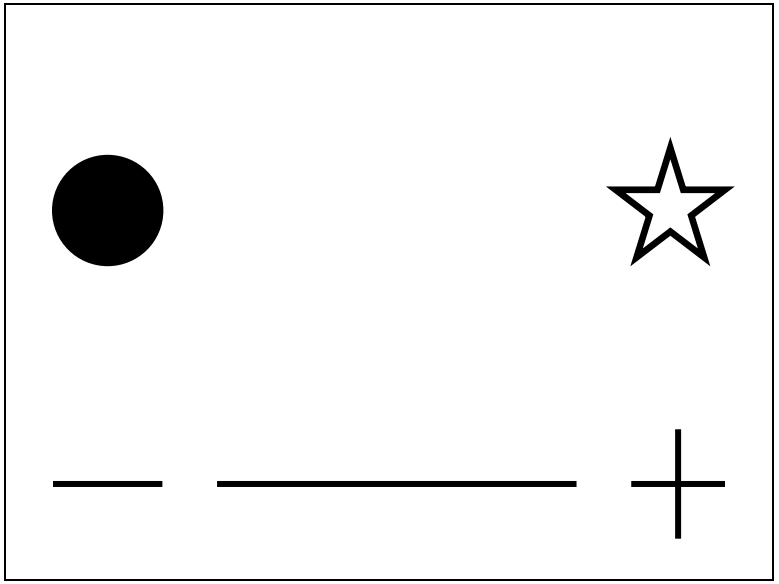


- WHITEMAN APPROACH CONTROL AIRSPACE EXTENDS FROM THE SURFACE TO 9,000 MSL.
- FREQUENCIES : APPROACH CONTROL - 127.45 / 284.0
  DEPARTURE CONTROL - 125.925 / 343.65
  ARRIVAL CONTROL - 119.25 / 256.7
- SERVICES: VFR TRAFFIC ADVISORIES, FULL IFR SERVICES
- WHITEMAN AFB HAS A VERY HIGH DENSITY OF T-38, B-2, A-10 PATTERN OPERATIONS, AND ARMY NATIONAL GUARD HELICOPTERS FROM SURFACE TO 4,000 FT MSL.
- PATTERN SPEEDS RANGE FROM 40 KTS TO 300 KTS.

LOCATING YOUR BLIND SPOT

1. With the right eye closed, look at the star of the top shapes in the figure below. Move the paper back and forth about one foot from the eye. The circle on the left will disappear. At that point it is projected on the blind spot.

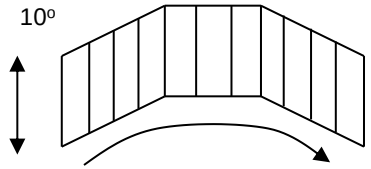
2. With the right eye closed, look at the cross at the right in the lower part of the figure below. When the white space falls in the blind spot, the black line appears to be continuous. This phenomenon helps understand why we are not normally aware of the blind spot.



EFFECTIVE SCANNING & OVERCOMING NATURAL BLIND SPOT

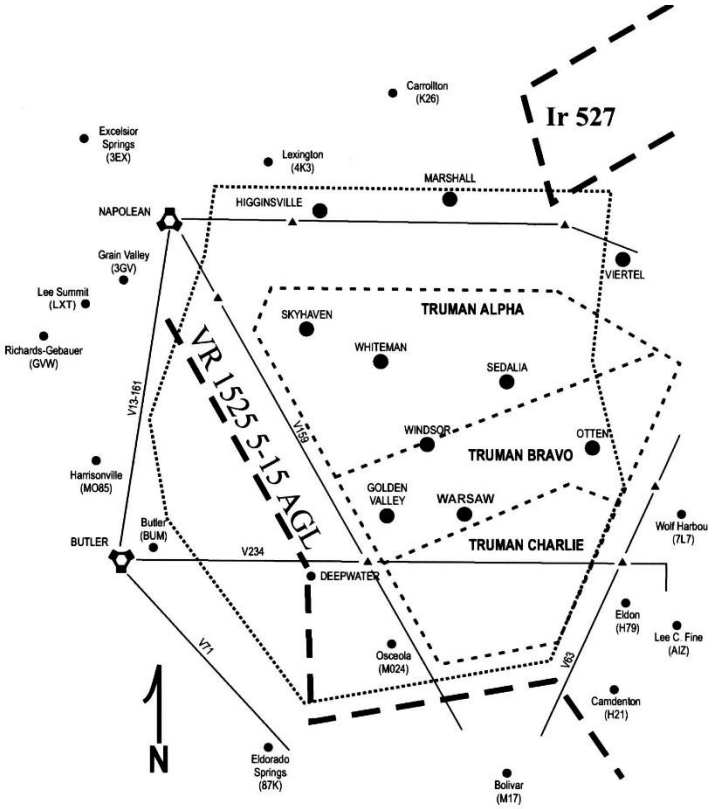
Traffic detection can be made only through a series of eye fixations at different points in space. The windshield is divided into segments and the pilot methodically scans for traffic in each block of airspace in sequential order. Start at the far left of your visual area and make a methodical sweep to the right, pausing in each block of viewing area to focus your eyes. At the end of the scan, return to the instrument panel for a couple of seconds then start the scan over.

SCANNING TECHNIQUE

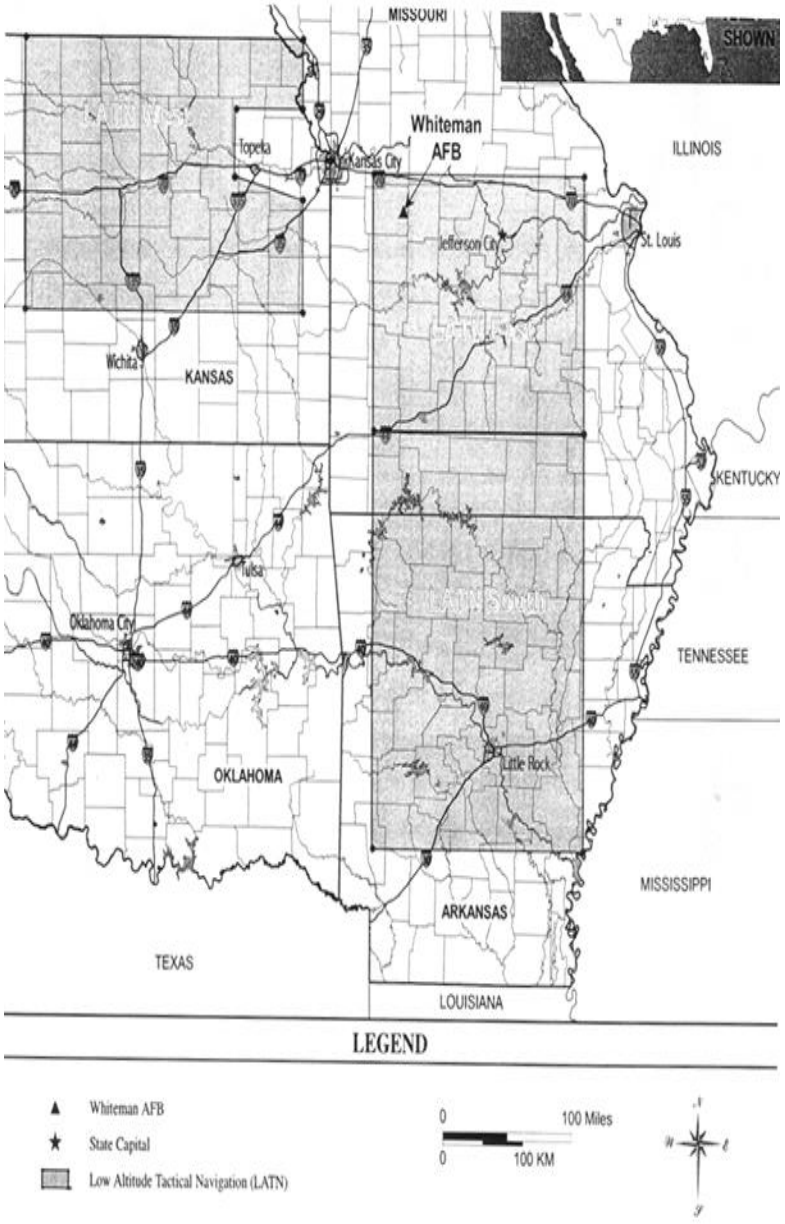


It is important to realize that all of us have a blind spot. The potential for a midair collision can lie within this blind spot area. At one mile this area could be 800 feet by 500 feet, and at 5 miles the area may be as large as 4/5 of a mile. The blind spot may vary as to different types of aircraft and different face structures.

LOCAL MILITARY TRAINING ROUTES



- VR 1525 IS FLOWN BY HIGH SPEED MILITARY JET AIRCRAFT BETWEEN SUNRISE AND SUNSET, AT 500' AGL TO 9,000' MSL.
- ROUTE WIDTH IS 3-5 NM EITHER SIDE OF CENTERLINE
- VR 1525 IS TO BE FLOWN IN VMC CONDITIONS ONLY
- IR 527 IS TO BE FLOWN IN VMC CONDITIONS ONLY

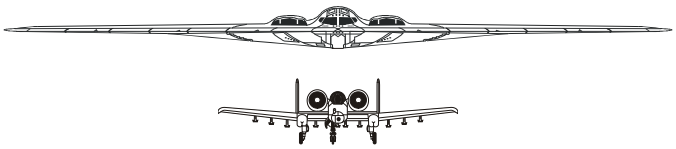


SEE AND BE SEEN

TURN ON YOUR TRANSPONDER
AND BE SEEN BY ATC
CALL
WHITEMAN APPROACH
127.45

12 SECONDS TO IMPACT

This is the actual size of each aircraft as they would look to you from a head on collision course 12 seconds from impact.



AIRCRAFT ARE ONE MILE FROM YOU

Conflict aircraft speed is 250 knots, your speed is 110 knots, closure rate is 360 knots; 6 nm per minute

AIRCRAFT APPROACH EACH OTHER AT 600 FEET (TWO FOOTBALL FIELDS) PER SECOND

TOTAL TIME REQURIES 12 SECONDS TO REACT AND AVOID AN IMPACT

6 Seconds to see, recognize and analyze . . .
4 Seconds to decide and start evasive maneuver . . .
2 Seconds to gain enough space to clear . . .

BOTTOM LINE

PILOTS MUST CONSTANTLY SCAN FAR OUT IN FRONT OF THE AIRPLANE TO BE ABLE TO AVOID A COLLISION

A-10 LATN Area Familiarization

LATN (Low Altitude Tactical Navigation) Training is critical flight training for A-10s -- designed to allow pilot and aircraft to defeat enemy ground/air weapons systems and survive during wartime by staying proficient at low altitude maneuvering.

During this training A-10's can perform heavy maneuvering -- flying at low altitudes and relatively high airspeeds throughout the defined areas:

LATN West -- Northeastern Kansas
LATN South -- Most of Arkansas (Just North of Texarkana)
LATN East -- Central Missouri
ACTUAL BOUNDARIES:

Area	Northern	Southern	Eastern	Western
LATN West*	N 40°00′	N 38°00′	W 095°00′	W 099°00′
LATN East	N 39°00′	N 37°00′	W 091°00′	W 094°00′
LATN South	N 37°00′	N 34°00′	W 91°00′	W 094°00′

*Not including Kansas City Class B Airspace

Avoiding populated areas/airfields and within these areas A-10s can be operated as low as 300' AGL and at speeds exceeding 300 KIAS.

During operation within these areas when not in contact with controlling agencies, A-10s monitor UHF Freq 255.4 (FSS UHF Frequency).

As you can see, the LATN Area is extensive in scope and size and is intended as such to enhance training while decreasing the repetitive exposure footprints to rural locations.