

# *Useful Resources*

The following are a list of just a few of the many MACA resources available on the internet. We encourage you to incorporate them into your flight planning to the maximum extent possible.

1. **Defense Internet NOTAM Service:** This is an official resource to find airport NOTAMs, TFRs and ARTCC FDC NOTAMs.

<https://www.notams.jcs.mil>

2. **See and Avoid:** This is an official resource established by the Air National Guard Aviation Safety Division in order to combine existing military MACA programs on one web site.

<http://www.seeandavoid.org>

3. **Aviation Safety Reporting System:** This is an official resource which uses NASA as a third party between you and the FAA for Aviation Safety Reports. On the web site you can report actual or potential discrepancies involving flight safety with immunity.

<http://asrs.arc.nasa.gov>

4. **Aviation Safety Information Analysis and Sharing (ASIAS) System:** This is an official resource from the FAA serving as a source to integrate, analyze and share aviation safety data and information.

<http://www.asias.faa.gov>

5. **AC 90-48C:** FAA Advisory Circular covers collision avoidance incorporating human factors and regulations.

[http://www.faa.gov/regulations\\_policies/advisory\\_circulars/index.cfm/go/document.information/documentID/23090](http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/23090)

6. **Collision Course: Avoiding the Close Encounter:** This 41-minute video can be streamed online from the AOPA Air Safety Foundation web site.

<http://flighttraining.aopa.org/students/maneuvers/courses/index.html>



## Mid-Air Collision Avoidance Guide Travis AFB, CA



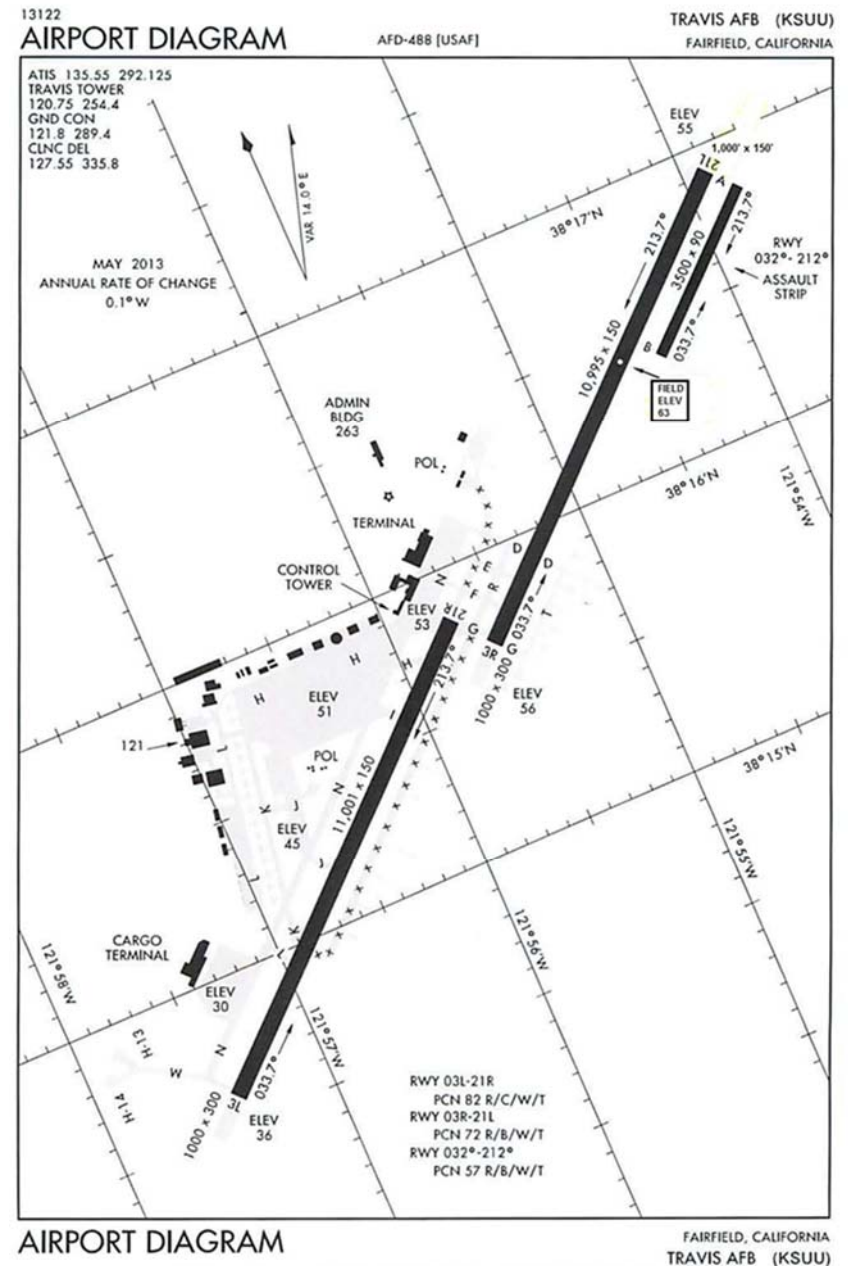
2017

# Introduction

The 60<sup>th</sup> and 349<sup>th</sup> AMW Safety Offices worked alongside Travis's air traffic controllers to prepare this pamphlet with the common interest of making our skies safer. Its purpose is to stress the **high potential for midair collisions in our local area** and offer ways of reducing this risk. Within these pages, you will find the necessary facts on our airspace, flight patterns, and military aircraft. You'll also find tips and techniques to assist you in becoming a more observant and aware pilot. Please read and heed its advice and pass our recommendations on to your fellow aviators.

**The airspace surrounding Travis AFB is some of the busiest airspace in the U.S.** The proximity of San Francisco, Oakland, and Mineta San Jose International Airports drives a large amount of the sightseeing general aviation traffic to the North Bay Area region. Additionally, **there are 30 public use airports within a 50 mile radius of Travis.** When including non-public use airfields, there are over 100. The central location of Travis in relation to general aviation airports, the Bay, and the Delta means traffic is constantly flying in and around military airspace.

**The threat of a midair collision is very real.** Operations in our crowded airspace require extra vigilance by both military and civilian pilots. Communication with available air traffic control agencies, aggressive scanning by aviators, and the knowledge of the airspace structure and potential "hot spots" will help us safely operate together. Thank you for your time and concern for aviation safety!



# Contact Information

**BE CONSERVATIVE:** Military tactical maneuvers normally remain within 12 NM of Travis AFB

**BE AWARE:** Tactical maneuvers may take place anywhere from surface to >10,000' MSL. Climb/Descent rates can be as high as 5,000 - 10,000 feet per minute!

**BE VISIBLE:** Turn on all available exterior lights

**BE VIGILANT:** Scan outside for maneuvering heavy aircraft

**BE KNOWLEDGEABLE:** The Travis IFR radar pattern and VFR overhead pattern are contained within Alert Area A-682

**BE SAFE:** The best way to fly in/near Travis airspace: Avoid it

**BE SMART:** If you have to fly through Travis airspace:

**SQUAWK** (Mode 3A & Mode C if able)

**TALK** (It may be optional, but it helps!)

**LISTEN** (Note potential for conflicts)

**CLEAR** (Constantly scan for traffic)



**THANK YOU** for your cooperation and help in keeping Travis' airspace a safe environment to fly in.

## **60th/349th Air Mobility Wing**

Flight Safety Office (707) 424-1113

E-Mail 60amw.sef@us.af.mil

Airfield Management (707) 424-0028

Public Affairs

60th AMW (AD) (707) 424-2011

349th AMW (Res) (707) 424-3936

## **FAA Sacramento Flight Standards District Office**

[http://www.faa.gov/about/office\\_org/field\\_offices/fsdo/sac/](http://www.faa.gov/about/office_org/field_offices/fsdo/sac/)

7:30am to 4:00pm (Monday-Friday) / visit by appointment only

1102 Corporate Way, Suite 200

Sacramento, CA 95831

Phone (916) 422-0272

Fax (916) 422-0462

## **Rancho Murieta Flight Service Station**

7443 Murieta Drive

Rancho Murieta, CA 95683

(800) WX-BRIEF (992-7433)

122.2 MHz





# Airspace Users

The radar and VFR patterns at Travis are typically utilized most heavily by three Air Force aircraft assigned to Travis (C-17, C-5, and KC-10). However, you will also see other aircraft conduct training in the Travis pattern. The most common aircraft you will encounter are described below.

## C-17A



**Primary Function:** Cargo and troop transport  
**Prime Contractor:** Boeing Company  
**Power Plant:** Four Pratt & Whitney F117-PW-100 turbofan engines  
**Thrust:** 40,440 pounds, each engine  
**Wingspan:** 169 feet 10 inches (to winglet tips) (51.75 meters)  
**Length:** 174 feet (53 meters)  
**Height:** 55 feet 1 inch (16.79 meters)  
**Cargo Compartment:** length, 88 feet (26.82 meters); width, 18 feet (5.48 meters); height, 12 feet 4 inches (3.76 meters)  
**Speed:** 450 knots at 28,000 feet (8,534 meters) (Mach .74)  
Service Ceiling: 45,000 feet at cruising speed (13,716 meters)  
**Range:** Global with in-flight refueling  
**Crew:** Three (two pilots and one loadmaster)

**CLEAR** – Before executing a climb, turn, or descent, or any other maneuver, ensure the area is clear using the appropriate clearing procedures.

**COMMUNICATE** – When flying into or out of uncontrolled airports, broadcast your position and intentions. Request and use available RADAR services. Remember, you are ultimately responsible for seeing and avoiding other traffic and should not relax your visual scan even in a RADAR environment.

**SQUAWK** – If your aircraft is transponder equipped, turn it on and adjust to reply on both Mode 3/A and C.

**BE SEEN** – In order to enhance the see and avoid concept, you are encouraged to turn on your anti-collision lights or other appropriate lights whenever your engines are running. You are further encouraged to turn on your landing lights when operating below 10,000' MSL, day or night, especially within 10 miles of an airport, or in areas of reduced visibility. While use of landing lights is greatly appreciated, please observe the aircraft manufacturer's recommendations for landing light operations.



# MAC Hazard ID and Avoidance

During a three-year study of midair collisions involving civilian aircraft, the National Transportation Safety Board (NTSB) determined that:

The occupants of most midair collisions were on a pleasure flight with no flight plan filed.

Nearly all midair collisions occurred in VFR conditions during weekend daylight hours.

The majority of midairs were the result of a faster aircraft overtaking and hitting a slower aircraft.

No pilot is immune. Experience levels in the study ranged from initial solo to the 15,000 hour veteran.

The vast majority of midairs occurred at uncontrolled airports below 3,000’.

Enroute midairs occurred below 8,000’ and within 25 miles of the airport.

Flight instructors were onboard one of the aircraft in 37 percent of midairs.

## **Mitigation Techniques:**

**PLAN AHEAD** – Thoroughly review your intended route of flight before walking out to your airplane. Plan to avoid alert areas, restricted areas, Military Training Routes and Military Operations Areas, if possible. Check NOTAMs and identify possible conflict areas.

**SEE AND AVOID** – Scan the airspace ahead of you and to the side using proper scan techniques. Periodically check behind you since the majority of midairs occur with on aircraft overtaking another.

## C-5M



**Primary Function:** Heavy Strategic Airlift

**Prime Contractor:** Lockheed Martin Corp.

**Power Plant:** Four F-138 General Electric engines (CF-6)

**Thrust:** 50,580 pounds, each engine

**Wingspan:** 222 feet 9 inches (67.91 meters)

**Length:** 247 feet 1 inch (75.53 meters)

**Height:** 65 feet 1 inch (19.84 meters)

**Cargo Compartment:**

- Height, 13 feet 6 inches (4.11 meters)

- Width, 19 feet (5.79 meters)

- Length, 143 feet, 9 inches (43.8 meters)

**Pallet Positions:** 36

**Maximum Cargo:** 285,000 pounds (122,472 kilograms)

**Maximum Takeoff Weight:** 840,000 pounds (381,024 kilograms)

**Speed:** 591 mph or Mach 0.77

**Unrefueled Range of C-5M:** About 5,250 nautical miles, e.g., Travis AFB, Del., to Yokota AB, Japan, with 120,000 lbs of cargo. About 7,000 nautical miles with no cargo on board.

**Crew:** Six (pilot, co-pilot, two flight engineers and three loadmasters)

## KC-10A



**Primary Function:** Aerial tanker and transport  
**Contractor:** The Boeing Company  
**Power Plant:** Three General Electric CF6-50C2 turbofans  
**Thrust:** 52,500 pounds, each engine  
**Length:** 181 feet, 7 inches (54.4 meters)  
**Height:** 58 feet, 1 inch (17.4 meters)  
**Wingspan:** 165 feet, 4.5 inches (50 meters)  
**Speed:** 619 mph (Mach 0.825)  
**Ceiling:** 42,000 feet (12,727 meters)  
**Maximum Takeoff Weight:** 590,000 pounds (265,500 kilograms)  
**Range:** 4,400 miles (3,800 nautical miles) with cargo; 11,500 miles (10,000 nautical miles) without cargo  
**Maximum Cargo Payload:** 170,000 pounds (76,560 kilograms)  
**Pallet Positions:** 27  
Maximum Fuel Load: 356,000 pounds (160,200 kilograms)  
**Crew:** Four (pilot, co-pilot, flight engineer and boom operator) Certain missions may require additional crew members. In aeromedical evacuation missions, a basic crew of five (two flight nurses and three medical technicians) is added. Medical crew may be altered as required.

## Travis Airfield Information

<b>ICAO</b>	KSUU
<b>Location</b>	N38°15.76' W121°55.65'
<b>Elevation</b>	63' MSL
<b>Runway 21R/03L</b>	11,001' by 150'
<b>Runway 21L/03R</b>	10,995' by 150'
<b>Assault Landing Zone 21LZ/03LZ</b>	3,500' by 90'

### NAVAIDS

SUU TACAN	113x
Runway 21L ILS (CAT II)	110.10
Runway 03L ILS	108.35

### Frequencies

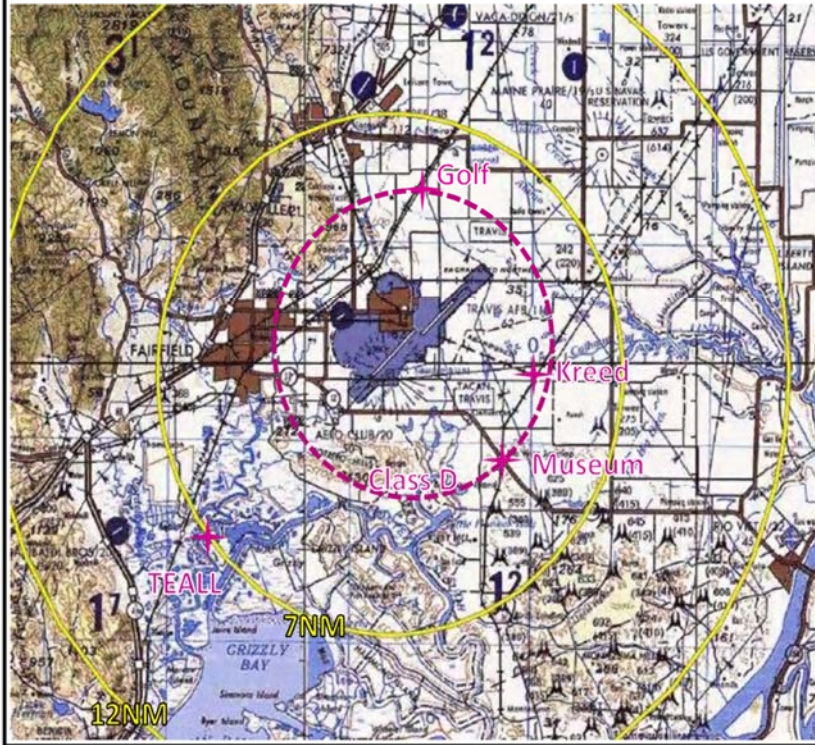
ATIS	135.55 / 292.125
Tower	120.75 / 254.4
Approach	
North of V150	126.60 / 291.0
South of V150	119.90

*This information is current as of 2017.  
Please check flight publications for any changes.*

# Tactical Arrivals & Departures

E-6B

Golf	Kreed	Museum	TEALL
SUU/355/005	SUU/074/004	SUU/110/004	SUU/212/007
N38 19 37.9 W121 55 23.0	N38 14 40.2 W121 51 15.0	N38 12 25.3 W121 52 30.1	N38 10 08.0 W122 03 24.2
Golf Course	Road Intersection	Train Museum	ATC Waypoint



Expect random maneuvering over the top of and in the vicinity of all tactical reporting points by large aircraft from the surface to 10,000' MSL. Tactical training aircraft talk only on the Travis tower frequency.

High rate descents of up to and exceeding **10,000 fpm** at speeds of up to **250 kts** are common in the vicinity of all tactical points and Travis AFB.



**Primary Function:** Communications relay for fleet ballistic missile submarines (A and B models) and airborne command post for U.S. Strategic forces (B model).

**Contractor:** The Boeing Company.

**Date Deployed:** October 1998.

**Unit Cost:** 141.7 million.

**Propulsion:** Four CFM-56-2A-2 High bypass turbofans.

**Length:** 150 feet, 4 inches (45.8 meters).

**Height:** 42 feet 5 inches (12.9 meters).

**Wingspan:** 148 feet, 4 inches (45.2 meters).

**Weight:** Max gross, take-off. 342,000 lbs (154,400 kg).

**Airspeed:** 522 knots, 600 miles (960 km) per hour.

**Ceiling:** Above 40,000 feet.

**Range:** 6,600 nautical miles (7,590 statute miles, 12,144 km) with 6 hours loiter time.

**Crew:** 22



## T-38



**Primary Function:** Advanced jet pilot trainer

**Builder:** Northrop Corp.

**Power Plant:** Two General Electric J85-GE-5 turbojet engines with afterburners

**Thrust:** 2,050 pounds dry thrust; 2,900 with afterburners

**Thrust (with PMP):** 2,200 pounds dry thrust; 3,300 with afterburners

**Length:** 46 feet, 4 inches (14 meters)

**Height:** 12 feet, 10 inches (3.8 meters)

**Wingspan:** 25 feet, 3 inches (7.6 meters)

**Speed:** 812 mph (Mach 1.08 at sea level)

**Ceiling:** Above 55,000 feet (16,764 meters)

**Maximum Takeoff Weight:** 12,093 pounds (5,485 kilograms)

**Range:** 1,093 miles

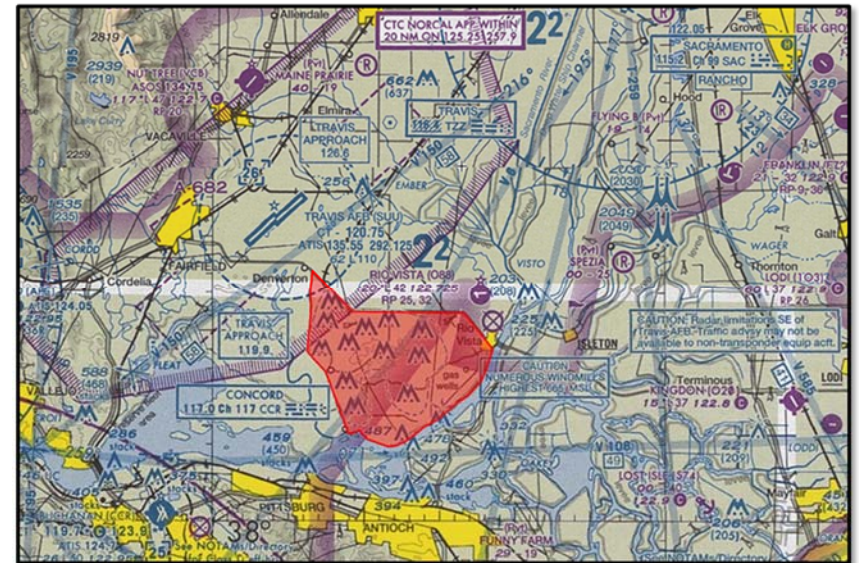
**Armament:** T-38A/C: none; AT-38B: provisions for practice bomb dispenser

**Crew:** Two, student and instructor

## Wind Farm Limitations

The wind farms southeast of Travis interfere with ATC radar. When the windmills are operating, controllers frequently receive false “hits” on their radar screens. Additionally, the windmills can mask legitimate radar returns.

Bottom line: **You cannot be seen on radar if you are not squawking!**



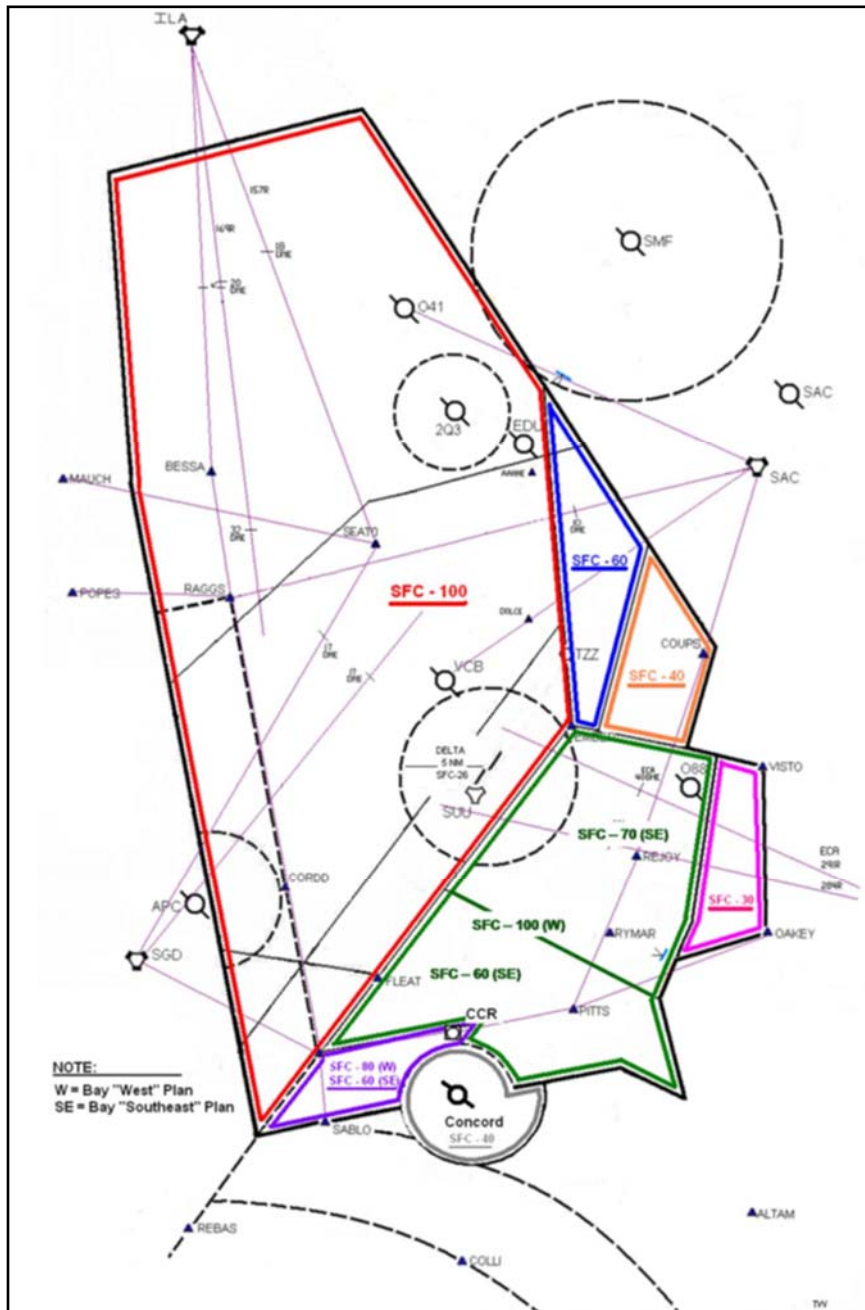
**Please contact Travis Approach Control on 119.9 for flight following or, at a minimum, squawk VFR.**

**Squawking, even if it is 1200, will make you visible to Travis Approach controllers when you are over the wind farms.**

# BE SEEN!



# Approach Control



# Airspace Description

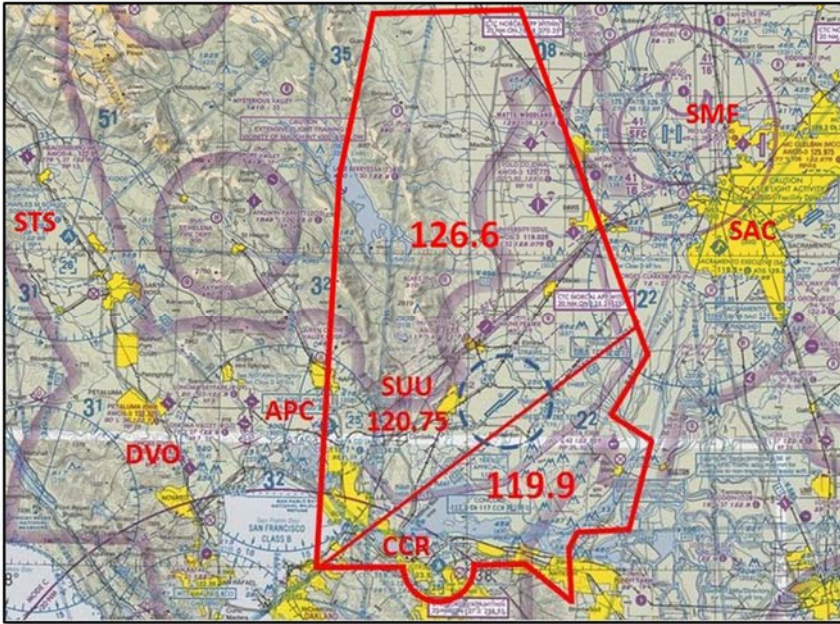
Travis AFB sits underneath Alert Area A-682. According to the 3 April 2014 AIM, section 3-4-6, alert areas “may contain a high volume of pilot training or an unusual type of aerial activity. Plots should be particularly alert when flying in these areas... and pilots of participating aircraft as well as pilots transiting the area must be equally responsible for collision avoidance.”

As you read through this pamphlet, it should become clear that this alert area was established with good cause – extreme caution must be exercised when transiting this airspace. It would not be unusual to encounter a C-17 four or five miles north of the field, flying 230 knots and descending at 12,000 feet per minute. The margin of error and reaction time needed to respond to a potential mid-air collision in this situation are both extremely small. When all three players – military pilots, controllers, and civilian pilots – are all on the same page, the chances of a mid-air collision decrease dramatically.

As you will see below, the furthest tactical point used at Travis is seven miles southwest of the field. While all tactical approaches begin from a tactical point, aircraft typically need to maneuver within several miles of the tactical points to align themselves for a tactical arrival. Caution should be exercised anytime you are within 10-12 miles of Travis.

Finally, it’s important to note that *aircraft conducting tactical departures and arrivals stay on tower’s frequency, even when they’re outside of tower’s airspace.* This can occur because tower controllers coordinate with approach controllers. So it cannot always be assumed that monitoring an approach frequency will ensure you’re aware of traffic operating in the tactical environment. The only way to ensure you know of any traffic which may be a threat to you is by participating in flight following.

# ATC Communications



## Travis Approach Class E Airspace

Surface to 10,000 ft MSL: VFR Flight Following Available and highly encouraged

Contact Travis Approach:

126.6 – North of V150 Airway

119.9 – South of V150 Airway

## Travis Class D Airspace

Surface to 2,600 ft MSL within 4.3 NM of Travis AFB

Remain outside Class D unless approved by Travis Tower

Travis Tower Frequency – 120.75

# IFR Departures

Travis has two primary runways and an assault strip, all oriented on a 030/210 heading. The image below shows typical departure routing for IFR traffic departing Travis.

