BEALE AIR FORCE BASE

MID AIR COLLISION AVOIDANCE

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Fellow aviators, as we share the skies over Northern California we also share the responsibility to be aware of potential traffic conflicts and avoid them. We must arm ourselves with knowledge of our airspace, aircraft performance, blind spots, physiological limitations, visual scanning techniques, aircraft visual identification and mutual hazards to safe flight, with the ultimate goal of reducing close calls and eliminating midair collisions.

Before climbing into the cockpit, we must conduct thorough preflight planning to identify and avoid potential traffic conflicts. Self study of resources such as FAA Advisory Circular 90-48D Pilots' Role in Collision Avoidance should be part of our preflight preparation. Once in the air, we must use all available resources to be seen and heard by Air Traffic Controllers and other aircraft. We must keep a vigilant lookout and utilize an effective visual scan to recognize and avoid potential conflicts. In the event of a near miss, we should protect our fellow aviators from future mishaps by reporting the event and sharing our lessons from the near miss.

Regardless of whether we are flying under instrument flight rules or visual flight rules, each person operating an aircraft shall maintain vigilance so as to see and avoid other aircraft per 14 CFR Part 91.113.

U-2 Factsheet

RQ-4 Factsheet

T-38 Factsheet

FAA Advisory Circular 90-48D Pilot's Role in Collision Avoidance

Beale Air Force Base

ICAO: KBAB

Runway: 15 / 33

Dimensions: 12,001' x 300'

Field Elevation: 113'

Class C Airspace: Surface to 4,100'

ATIS: 124.55 / 273.5

Tower: 119.4 / 284.75

Nor Cal Approach: 125.4 / 259.1

T-38 VFR Traffic Pattern (typical):

- 2,100', 300 KIAS, west of runway

U-2 VFR Traffic Pattern (typical):

- 1,600', 130 KIAS, east of runway
- 2,100' High Key (flameout pattern)
- 500' on 3-mile final no-flap pattern

KC-135 VFR Traffic Pattern (typical):

- 1,600', 180-250 KIAS

Unique Hazards

Aerobatics in Military Operating Areas

Multi-aircraft formations

Aerial Refueling

Remotely Piloted Aircraft

Fast, difficult to see aircraft

Steep, fast climbs

Steep spiral climbs/descents

Aircraft primarily utilize UHF radios

Vehicles on runway and taxiways

Collision Avoidance Strategy

- **Clear Effectively, Always**

Each crew member is responsible for clearing, regardless of cockpit position or experience. Pilots must develop an effective scanning technique which maximizes visual scanning capabilities while monitoring instruments as well. Scanning with a series of short, regularly spaced eye movements that bring successive 10° sectors of the sky into the central visual field long enough to focus on a cloud or object is an example of an effective scan. Knowing your aircraft's blind spots and using wing rocks or S-turns to clear these areas is critical. Remember, aircraft on a collision course will have little movement relative to your windscreen and are more difficult to visually acquire. Find an effective scan that works for you, and always use it.

- **Plan to Avoid or Mitigate Conflicts**

Know where congested airspace is relative to your route of flight and avoid high density areas such as departure and arrival corridors, traffic patterns, and MOAs. Double check for NOTAMs and TFRs before you takeoff.

- **Use All Available Resources**

Improve your chances of avoiding conflicts. Communicate appropriately with ATC and utilize flight following. Squawk appropriately. Utilize TCAS and turn on anti-collision lights.

- **You are responsible to See and Avoid**

Pilots have a regulatory responsibility to see and avoid other aircraft when weather conditions permit (14 CFR Section 91.113(a))

RQ-4 Global Hawk

Typical Speeds: 120—150 KIAS

Approach Speeds: 105—130 KIAS

Max Climb Rate: 6,000 Ft/Min

ATC Radios: 1 UHF/VHF

Remotely piloted, cannot see and avoid

No TCAS

U-2 Dragon Lady

Typical Speeds: 90—220 KIAS

Approach Speeds: 70—130 KIAS

Max Climb Rate: 15,000 Ft/Min

ATC Radios: 2 UHF/VHF

Limited visibility during steep climbs

No TCAS

KC-135 Stratotanker

Typical Speeds: 150—350 KIAS

Approach Speeds: 155—250 KIAS

Max Climb Rate: 4,900 Ft/Min

ATC Radios: 2 UHF/VHF

Multi-aircraft dissimilar formations

Heavy wake turbulence

T-38 Talon

Typical Speeds: 300—500 KIAS

Approach Speeds: 155—240 KIAS

Max Climb Rate: 13,000 Ft/Min

ATC Radios: 1 UHF

300 KIAS below 10,000 Ft

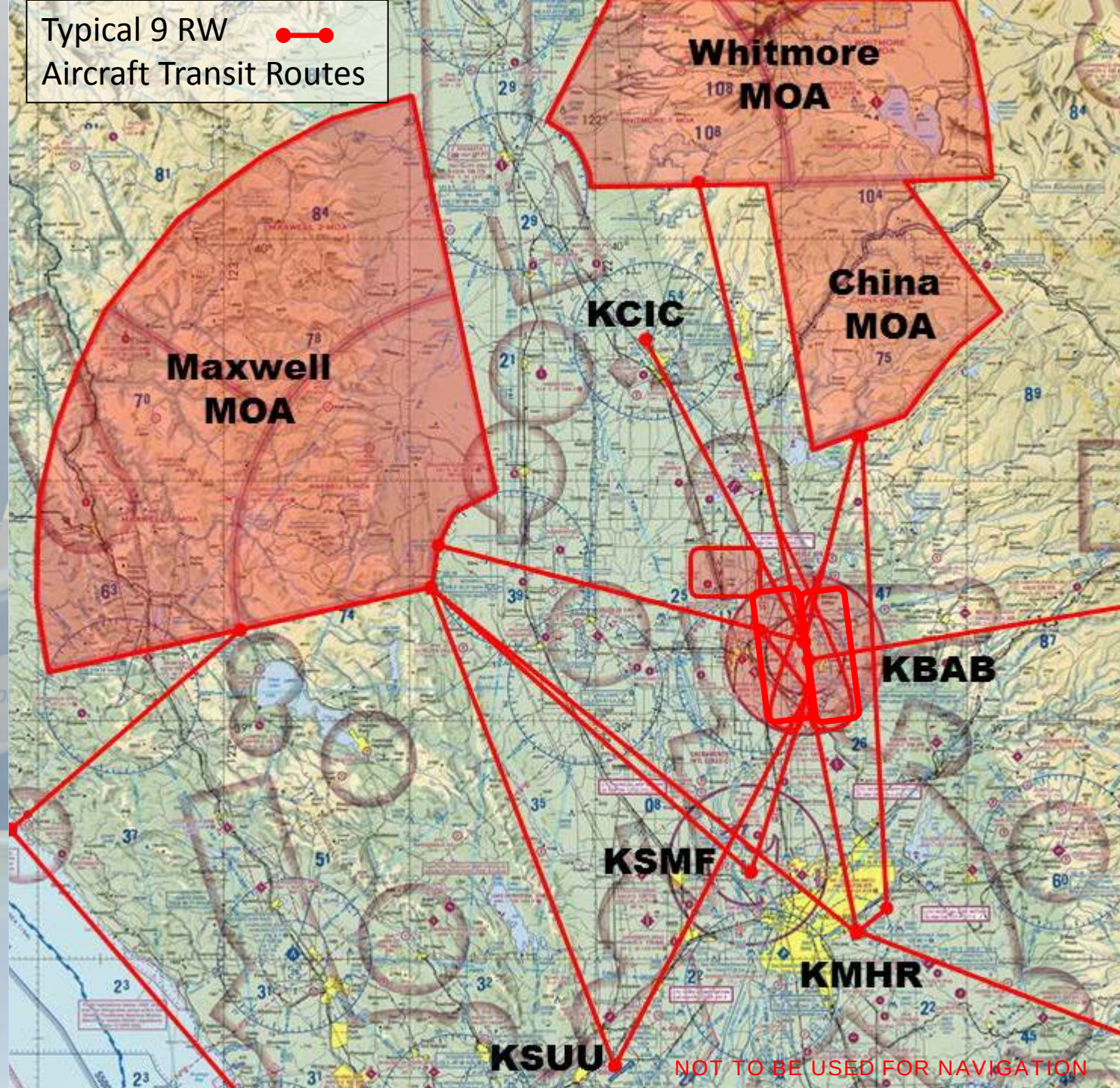
No TCAS

Congested Airspace

There are 111 airfields, numerous parachute drop zones, soaring areas, student training areas, crop dusting areas, and Military Operations Areas (MOA) sharing the sky within 50 miles of Beale Air Force Base. The airspace above Beale and on the approach and departure ends of the runway is busy with aircraft making fast and often steep climbs and descents.

Beale aircraft frequently fly between Mather (KMHR), Sacramento International (KSMF), Chico Municipal (KCIC), Travis Air Force Base (KSUU), as well as the China, Whitmore and Maxwell MOAs (typical routes and airspace depicted in red). Beale Aero Club light aircraft train near the Sutter Buttes.

High-speed maneuvers, aerobatics and formation training are conducted in the China, Maxwell and Whitmore MOAs. Pilots operating under VFR should exercise extreme caution while flying within a MOA when military activity is being conducted. T-38s performing aerobatics at 500 KIAS utilize the entire MOA airspace block and have no air-to-air RADAR. Due to the difficulty visually acquiring a small, black, fast jet approaching you from potentially any aspect, it is wise to avoid active MOAs. The activity status of MOAs may change frequently, so pilots should contact any FSS within 100 miles to obtain real-time information and should contact the controlling agency for traffic advisories prior to entry.



Military Training Routes (MTR)

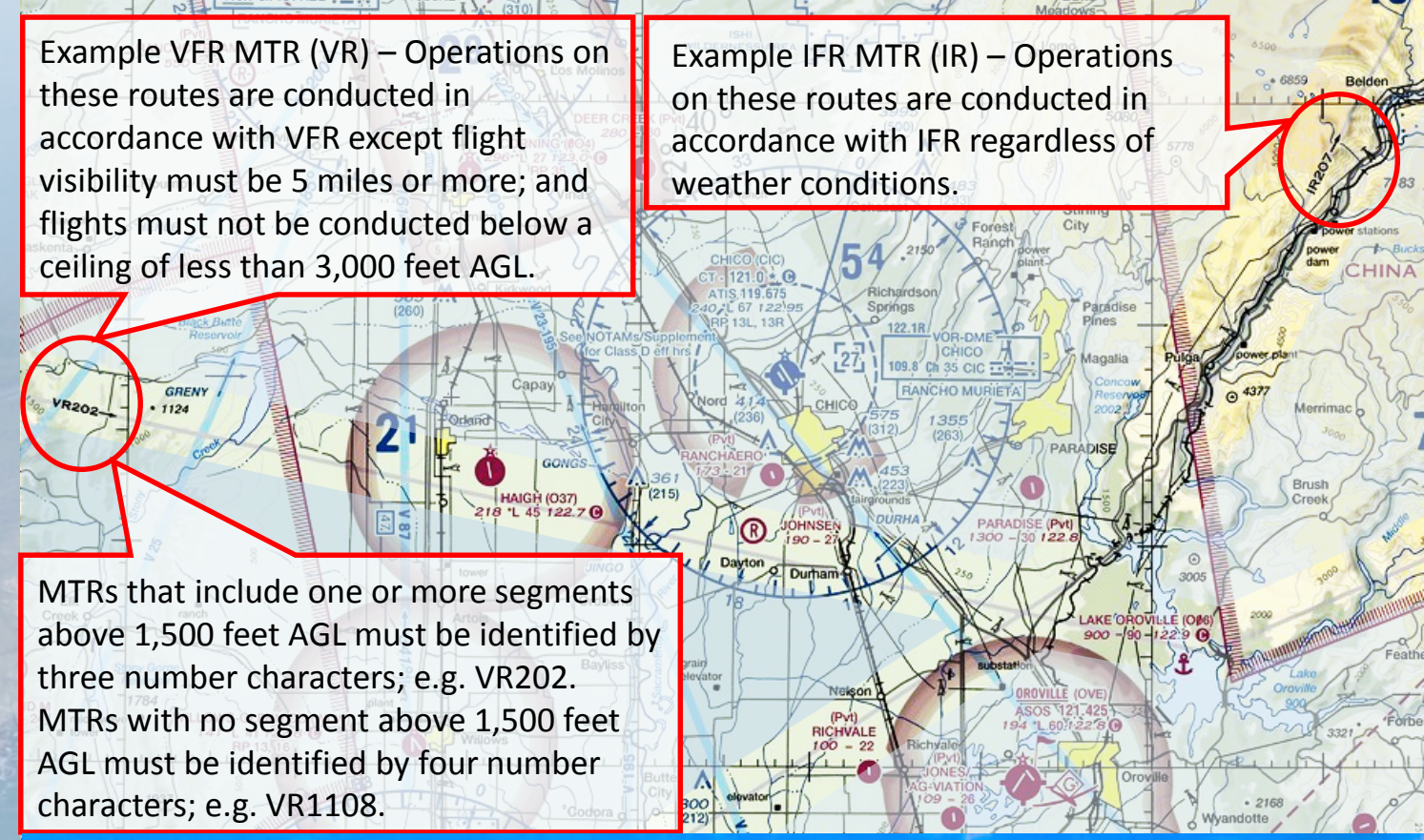
National security depends largely on the deterrent effect of our airborne military forces. To be proficient, the military services must train in a wide range of airborne tactics. One phase of this training involves “low level” combat tactics. The required maneuvers and high speeds are such that they may occasionally make the see-and-avoid aspect of VFR flight more difficult without increased vigilance in areas containing such operations.

Generally, MTRs are established below 10,000 feet MSL for operations in excess of 250 knots. However, route segments may be defined at higher altitudes. VFR Sectional Aeronautical Charts will depict military training activities such as IFR MTRs, VFR MTRs, MOAs, Restricted Areas, Warning Areas and Alert Areas.

Nonparticipating aircraft are not prohibited from flying within a MTR; however, extreme vigilance should be exercised when conducting flight through or near these routes. It is wise to avoid active MTRs to reduce the risk of mid air collisions. Pilots should contact a FSS within 100 NM of a particular MTR to obtain current information or route usage in their vicinity. Most military aircraft will announce entering and exiting a route on frequency 255.4 and may not be able to contact a FSS immediately due to terrain masking. Route width varies and can extend several miles on either side of the charted centerline.

Example VFR MTR (VR) – Operations on these routes are conducted in accordance with VFR except flight visibility must be 5 miles or more; and flights must not be conducted below a ceiling of less than 3,000 feet AGL.

Example IFR MTR (IR) – Operations on these routes are conducted in accordance with IFR regardless of weather conditions.



MTRs that include one or more segments above 1,500 feet AGL must be identified by three number characters; e.g. VR202. MTRs with no segment above 1,500 feet AGL must be identified by four number characters; e.g. VR1108.

The average pilot takes 12.5 seconds to observe, recognize, decide and act to avoid a mid air collision threat. If you observe the small black fast jet at two statute miles, it might already be too late to escape a collision.