

GA Operations in and near MOAs and MTRs

VTANG, 158th FW Safety Briefing & Tour – 8APR16

ENVIRONMENT: Back Country operations are a primary focus of the RAF (Recreational Aviation Foundation). Military Operations Areas (MOA) and Military Training Routes (MTR) are common in the back country. Both GA and the military share the obligation for safe operations.

1. BACKGROUND: Vermont Air National Guard 158th FW (F-16 Viper) hosted a Facility Tour and Safety Briefing on 8APR16 at KBTV. Aviators from the New England and New York area were invited as a part of a program to expand: 1) public **awareness** and 2) **safety** in Northeast airspace which Military, Commercial and General Aviation share. Several of the 158th pilots are also active back country operators – hence the RAF connection. Despite the non-flyable weather, approximately 80 attendees were present for an extremely informative, interactive and superbly organized event.

2. OVERVIEW: The event was held in the Base Operations Building of the 158th FW, VTANG, KBTV. Our excellent hosts, the Officers and Enlisted personnel were extremely knowledgeable and candid. The primary focus of the event is a detailed review of key aspects of operations in/near designated military airspace (MOAs and MTRs). KBTV, located in Burlington VT, is a shared commercial, military and GA operations facility. In addition to its assigned operational role, the 158th FW, established in 1946, currently serves all US ANG F-16 units as the major simulation and training facility. Attendees were granted limited, controlled access to the restricted simulator facility and attended a 45 minute briefing. Inclined attendees experienced a few thrilling minutes (under adult supervision) in the F-16 simulators. (Pun intended - F-16 seats incline at 30 degrees!) Interestingly the F-16, having undergone many upgrades, is based on a design from 1969, (damn good investment). It is the premier “multi mission, multi role” aircraft in ANG and Active Duty inventory. The F-16 will be replaced by the F-35. The 158th is the first ANG unit to receive this Gen 5 aircraft.

3. SIMPLE RULES: Most RAF and back country operations are VFR at lower altitudes.

Possible conflict in MOA/MTR is always a concern

RULE 1: MOA and MTR safety is **a team sport:** GA and Military help each other.

RULE 2: **Go under, over or around “hot” MOAs and MTRs.** Fly defensively.

RULE 3: **Urban legend is WRONG.** Military a/c can’t “see everything”. GA must help.

4. UNDERSTANDING MOA/MTR AIRSPACE:

a. Basics: MOAs/MTRs are exempt from the 250kt restriction below 10,000’KMSL.

i. MOAs are portrayed on both Sectionals and LoAlt IFR charts.

ii. MTRs above 1500’ AGL are portrayed on Sectionals and LoAlt charts.

iii. MTRs below 1500’ AGL are portrayed ONLY on Sectionals. Low MTRs (oil burner routes) have 4 digit identifiers: eg. VR1800, VR 1801.

iv. MTRs route types are: Visual: VR-nnn and Instrument: IR-nnn

v. MOAs and MTRs are “fast” or “slow”. Check controlling authority & ATC.

Your Review Assignment is:

www.cfinotebook.net/notebook/national-airspace-system/military-training-routes

b. Pilot workload: The cockpit data barrage in military aircraft is massive. Mission profiles are complex and constantly changing based on phase, ingress/egress and

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offensive/defensive actions. These pilots are damn good but do not assume they will always see you. They are managing a lot more complexity than you are.

- c. **SA – Situational Awareness:** Confucius say: The shrike hunting the locust should be aware the hawk hunting him. CHECK 6! CHECK 720! Much of SA is YOUR preparation. Know the MOA/MTR mission profile before transiting.
- d. **Speeds:** Depending on aircraft type and mission, MOA/MTR speeds can vary from:
 - a) Hover to b) 9 miles a minute (500kts+). High altitude dash speeds can exceed Mach 2. Some MOAs also involve parachute, dummy, live fire, drops and salvos.
 - i. Remember Sir Isaac Newton: $F = ma$. Warning: GA has neither.
- e. **Formations:** What you see is not always what you get. You face the dreaded **NOSAD**, the “None-One-Some-All Dilemma. Expect everything: Singles, 10nm trains, 5nm wide formations; ALL are possible. You won’t see them all.
- f. **Radar & ATC:** Radar is LOS (line of sight). In mountainous terrain there are many ATC coverage gaps. Aircraft radars may experience terrain masking in look down mode. Tight formations may appear as one target. If radar can’t see you, you don’t exist. Ground clutter and thermal discontinuities further complicate ID and tracking.
- g. **Squawk:** Military aircraft may have IFF interrogators and/or TCAS but YOU won’t know. Your best defense is: Unless IFR flight plan and working center, Squawk 1200 or assigned ATC code (mode A/C/S - ADS-B). SQUAWK WHAT YOU GOT and monitor controlling agency frequency during MOA/MTR transit.
- h. **Radar and IR Allocation:** Depending on mission profile, Military aircraft can select “look up” or “look down” mode. If the military aircraft radar or IR is not looking where you are, (your sector) you will not be seen. Never assume you ARE seen.
- i. **ATC Latency:** Feeds from ATC to either GA or military aircraft may experience up to 30 second latency. On board screens may not refresh fast enough.
- j. **MOA/TR Ownership:** MOA/TRs are “owned” by designated military units. Know who they are. Check sectionals and databases for frequencies, altitudes and times. Check NOTAMS and TFRs for activity times (tfr.faa.gov). Check military unit website(s). Check with ATC before penetration and if VFR, monitor ATC or controlling agency frequency for activity.
- k. **MOA/TR Schedules:** Most units have schedules for their operations. Check for them. Some areas are most active in early AM or late PM. Night ops also occur. Sorties can occur at dawn, daylight or dusk.

BONUS: When safely on the ground in the back country, listen and look you may see an incredible “airshow” – anything from low altitude penetration flights and chases to high altitude intercept and refueling contrails. One more back country treat for the observant!