



How to Read Aeronautical Charts and Airspace

© CFI Bootcamp, LLC



Teaching Airspace

Memory items – 5 things

Controlled and Uncontrolled

Identifying airspace on a chart

Cloud clearances/visibilities



Teaching Airspace

Entry requirements

Airspace/Aircraft Speed Limits

ADS-B Out Requirements

RVSM Requirements

5 things to memorize –
The only possibilities

1 sm – Clear of clouds

3 sm – Clear of clouds

1 sm – 1000 above, 500 below, 2000
laterally (1 Cessna 152)

3 sm - 1000 above, 500 below, 2000
laterally (3 Cessna 152s)

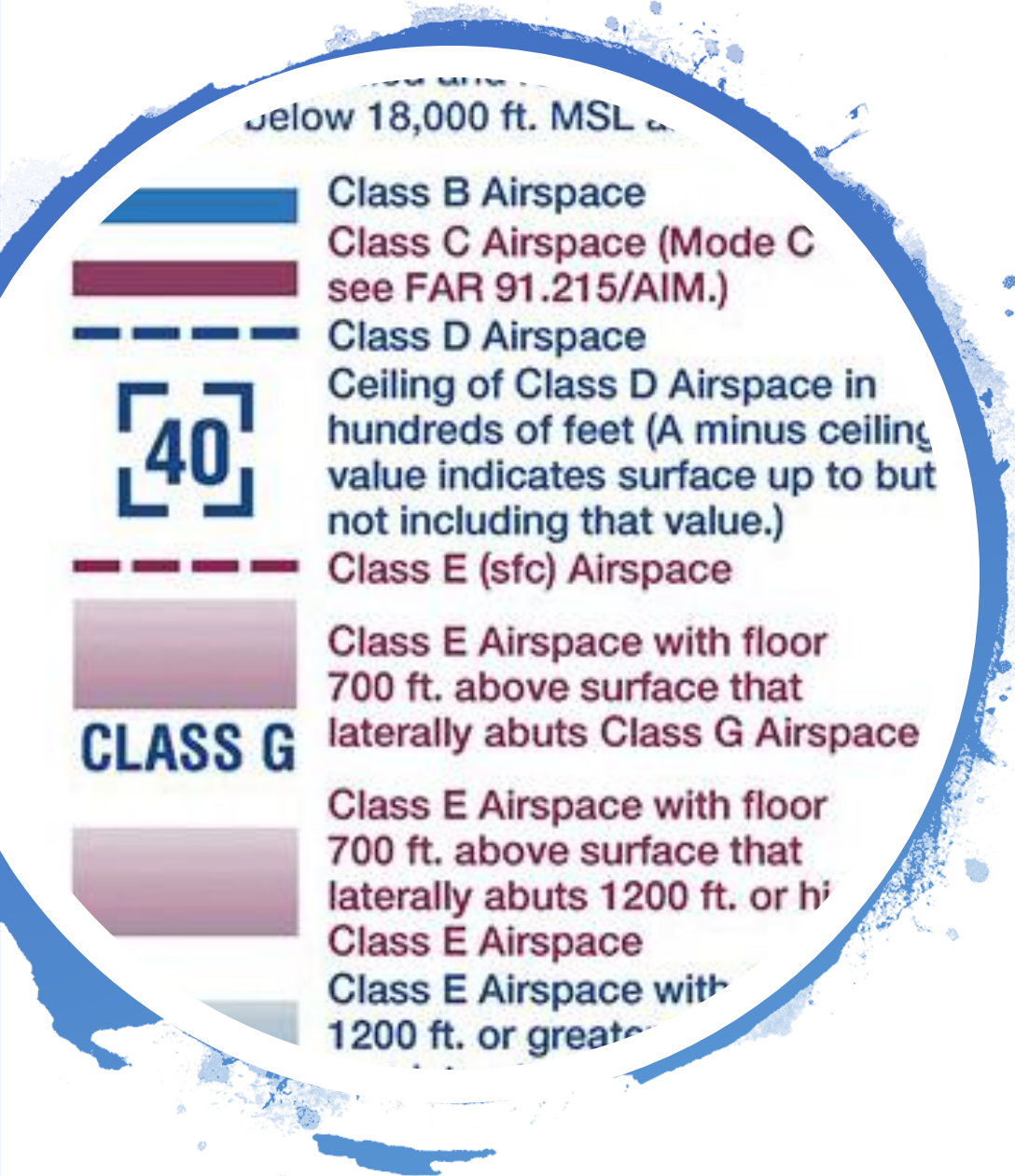
5 sm - 1000 above, 1000 below, 1 sm
laterally (5 F111s)



Broad Types of Airspace

Controlled

Uncontrolled



Sectional Chart Legend to Identify Airspace

Paper, Skyvector, Foreflight etc

Identify airspace, and altitudes

Identifying Class A - Airspace

18,000 MSL to FL600

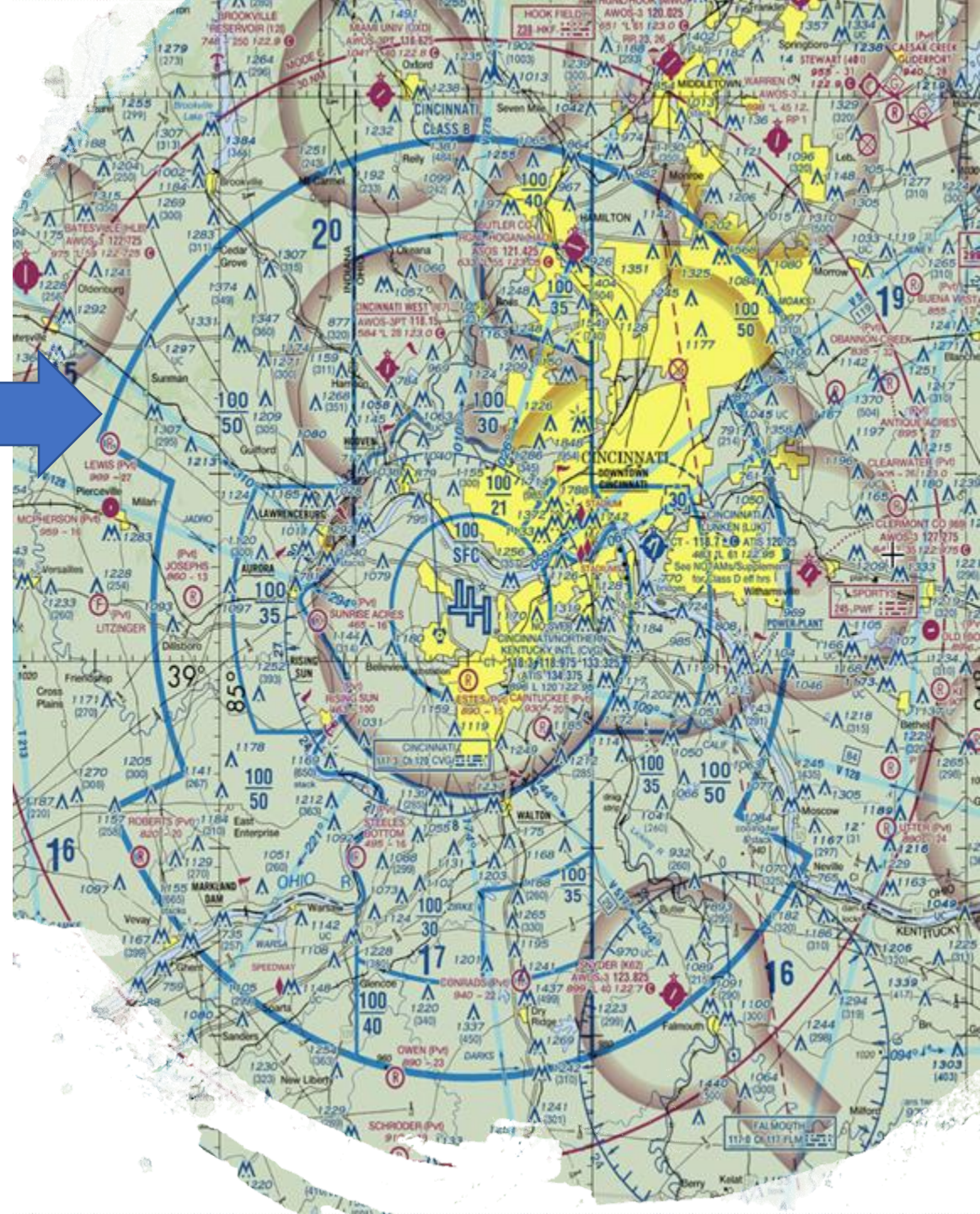


Identifying Class B Airspace

Solid blue lines

Segments – hundreds of ft

Usually to 10,000 MSL



Identifying Class C - Airspace

Solid magenta lines

Segmented – hundreds of ft



Identifying Class C Airspace

Two rings:

5 sm and 10 sm

Inner: Surface - 4000 MSL

Outer: 1200 AGL - 4000 MSL



Identifying Class D Airspace

Dashed cyan lines

4nm – Surface to 2500 MSL
(hundreds of ft)

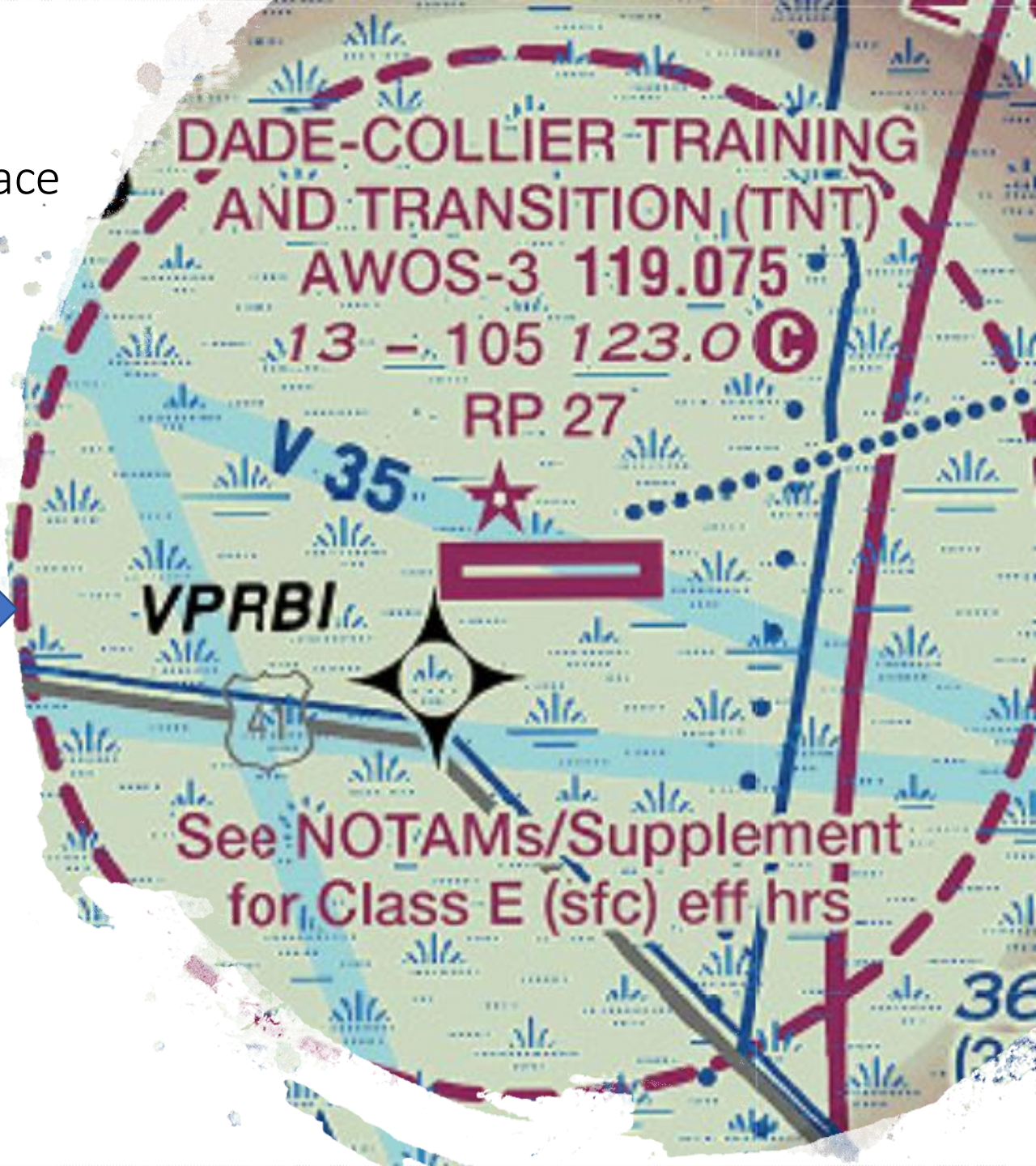
- Symbol up to but not including



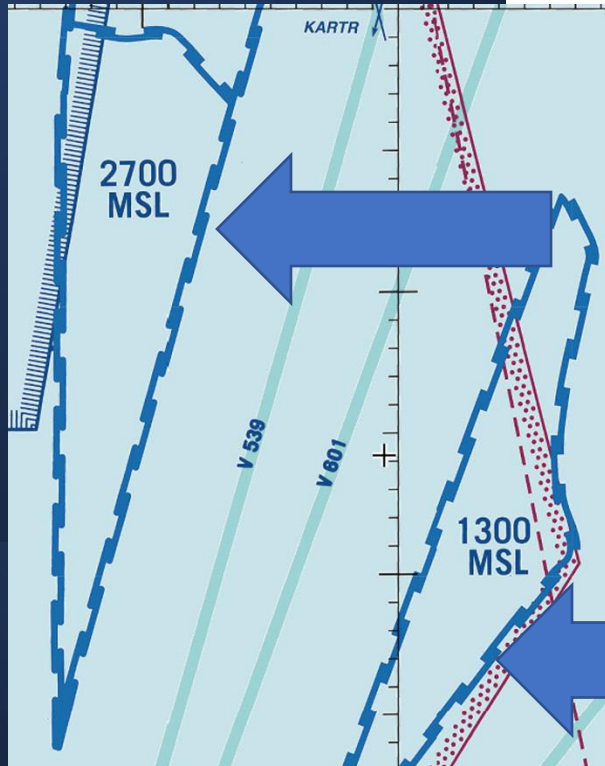
Identifying Class E Airspace that starts at the surface

SFC – to but not including
18,000 MSL

Dashed magenta lines



Identifying Class E Airspace that starts inside a zippered line

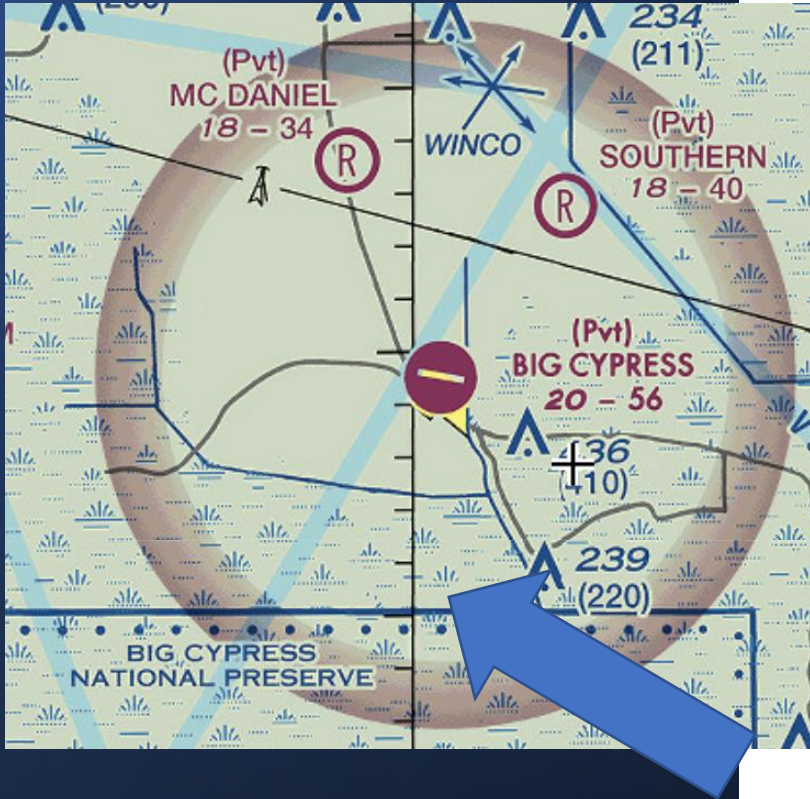


Starts at the printed Altitude

To but not including 18,000 MSL

Below is Class G

Identifying Class E Airspace that starts inside a vignette

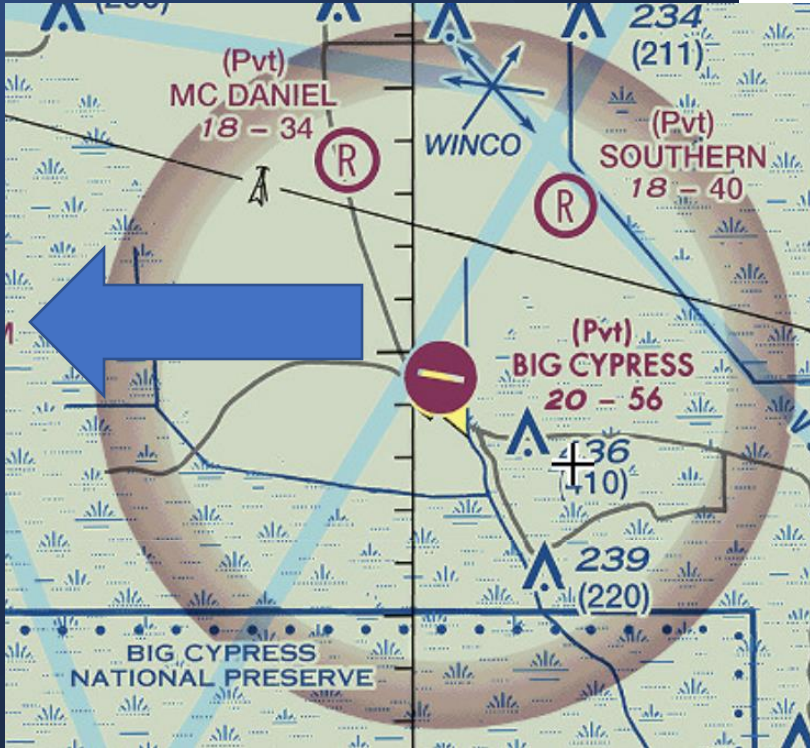


Feathered Side - Magenta vignette

Class E starts at 700 AGL

To but not including 18,000 MSL

Identifying Class E Airspace that starts inside a vignette

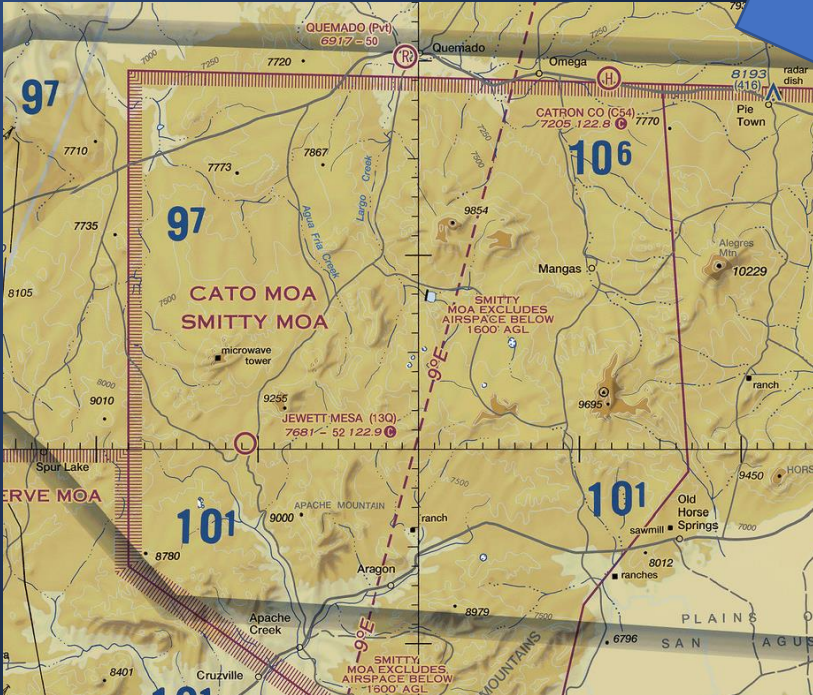


Hard Side - Magenta vignette

Class E starts at 1200 AGL

To but not including 18,000 MSL

Identifying Class E Airspace that starts inside a vignette

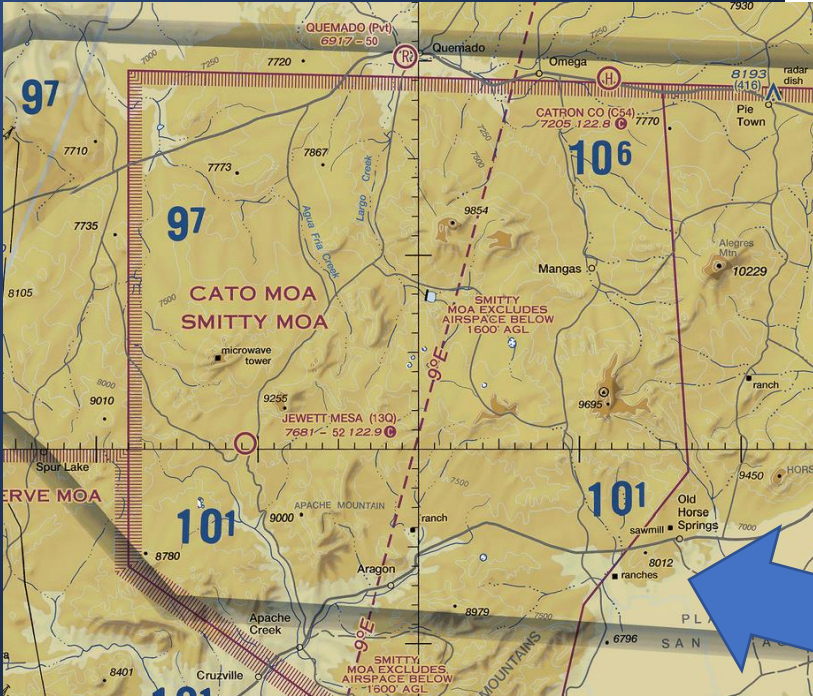


Feathered Side - Cyan vignette

Class E starts at 1200 AGL or Higher

To but not including 18,000 MSL

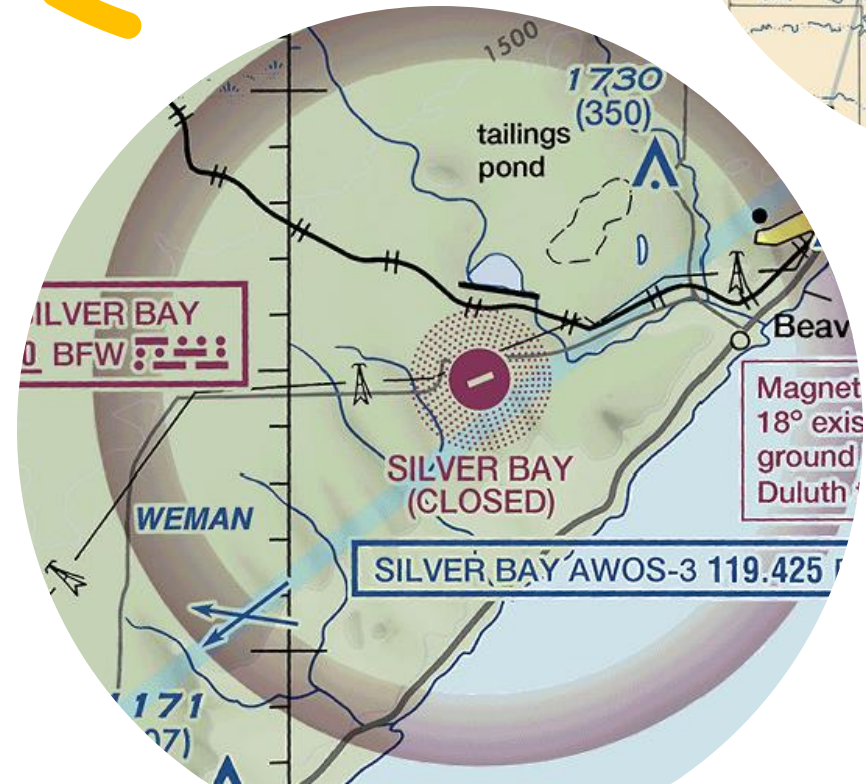
Identifying Class E Airspace that starts inside a vignette



Hard side of the vignette
Class G starts at the surface
To but not including 14,500 MSL

Identifying Class G Airspace

Below Class E



Cloud Clearance and Visibility Requirements

A No Cloud Clearance Requirement : IFR only

Cloud Clearance and Visibility Requirements

B

3sm Clear of Clouds

Cloud Clearance and Visibility Requirements

C

3sm
Vis



1,000'

2,000'

500'

Cloud Clearance and Visibility Requirements

D

3sm
Vis

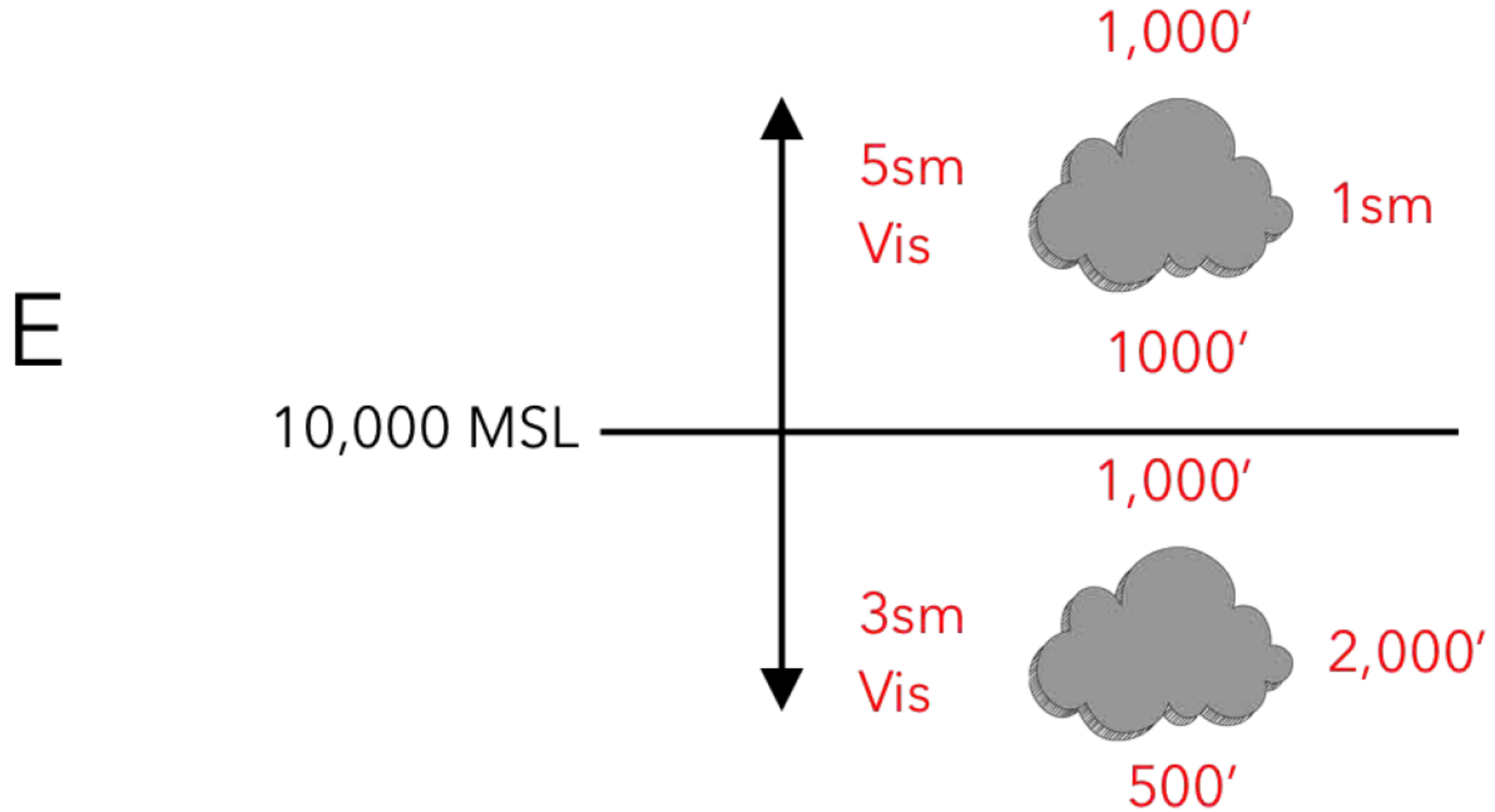


1,000'

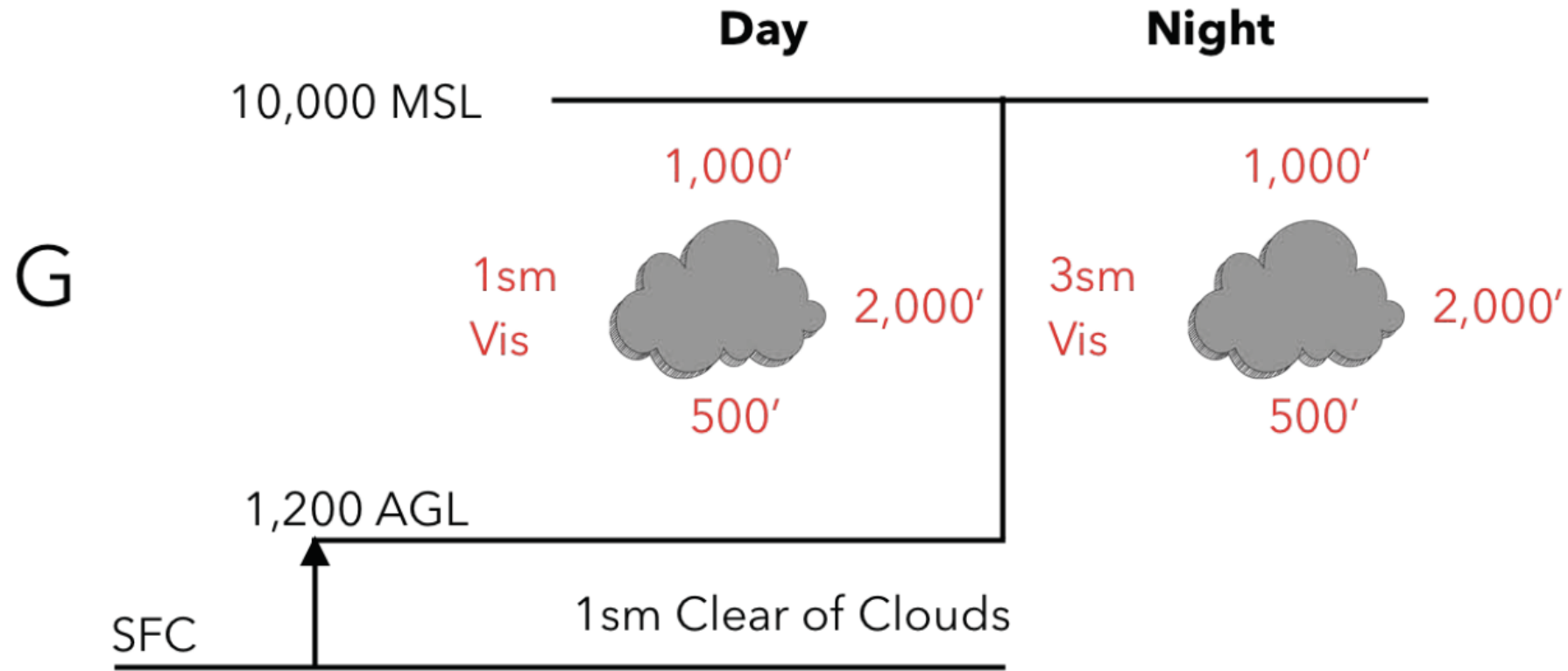
2,000'

500'

Cloud Clearance and Visibility Requirements



Cloud Clearance and Visibility Requirements



NIGHT EXCEPTION: BELOW 1200 AGL AND WITHIN ½ MILE OF THE TRAFFIC PATTERN – 1 SM CLEAR OF CLOUDS

Entry Requirements for Class A Airspace

Class Airspace	Entry Requirements	Equipment*	Minimum Pilot Certificate
Class A	ATC clearance	IFR equipped	Instrument rating
Class B	ATC clearance	Two-way radio, transponder with altitude reporting capability	Private—(However, a student or recreational pilot may operate at other than the primary airport if seeking private pilot certification and if regulatory requirements are met.)
Class C	Two-way radio communications prior to entry	Two-way radio, transponder with altitude reporting capability	No specific requirement
Class D	Two-way radio communications prior to entry	Two-way radio	No specific requirement
Class E	None for VFR	No specific requirement	No specific requirement
Class G	None	No specific requirement	No specific requirement
*Beginning January 1, 2020, ADS-B Out equipment may be required in accordance with 14 CFR part 91, section 91.225.			

Entry Requirements for Class B Airspace

Class Airspace	Entry Requirements	Equipment*	Minimum Pilot Certificate
Class A	ATC clearance	IFR equipped	Instrument rating
Class B	ATC clearance	Two-way radio, transponder with altitude reporting capability	Private—(However, a student or recreational pilot may operate at other than the primary airport if seeking private pilot certification and if regulatory requirements are met.)
Class C	Two-way radio communications prior to entry	Two-way radio, transponder with altitude reporting capability	No specific requirement
Class D	Two-way radio communications prior to entry	Two-way radio	No specific requirement
Class E	None for VFR	No specific requirement	No specific requirement
Class G	None	No specific requirement	No specific requirement
*Beginning January 1, 2020, ADS-B Out equipment may be required in accordance with 14 CFR part 91, section 91.225.			

Entry Requirements for Class C Airspace

Class Airspace	Entry Requirements	Equipment*	Minimum Pilot Certificate
Class A	ATC clearance	IFR equipped	Instrument rating
Class B	ATC clearance	Two-way radio, transponder with altitude reporting capability	Private—(However, a student or recreational pilot may operate at other than the primary airport if seeking private pilot certification and if regulatory requirements are met.)
Class C	Two-way radio communications prior to entry	Two-way radio, transponder with altitude reporting capability	No specific requirement
Class D	Two-way radio communications prior to entry	Two-way radio	No specific requirement
Class E	None for VFR	No specific requirement	No specific requirement
Class G	None	No specific requirement	No specific requirement
*Beginning January 1, 2020, ADS-B Out equipment may be required in accordance with 14 CFR part 91, section 91.225.			

Entry Requirements for Class D Airspace

Class Airspace	Entry Requirements	Equipment*	Minimum Pilot Certificate
Class A	ATC clearance	IFR equipped	Instrument rating
Class B	ATC clearance	Two-way radio, transponder with altitude reporting capability	Private—(However, a student or recreational pilot may operate at other than the primary airport if seeking private pilot certification and if regulatory requirements are met.)
Class C	Two-way radio communications prior to entry	Two-way radio, transponder with altitude reporting capability	No specific requirement
Class D	Two-way radio communications prior to entry	Two-way radio	No specific requirement
Class E	None for VFR	No specific requirement	No specific requirement
Class G	None	No specific requirement	No specific requirement
*Beginning January 1, 2020, ADS-B Out equipment may be required in accordance with 14 CFR part 91, section 91.225.			

Entry Requirements for Class E Airspace

Class Airspace	Entry Requirements	Equipment*	Minimum Pilot Certificate
Class A	ATC clearance	IFR equipped	Instrument rating
Class B	ATC clearance	Two-way radio, transponder with altitude reporting capability	Private—(However, a student or recreational pilot may operate at other than the primary airport if seeking private pilot certification and if regulatory requirements are met.)
Class C	Two-way radio communications prior to entry	Two-way radio, transponder with altitude reporting capability	No specific requirement
Class D	Two-way radio communications prior to entry	Two-way radio	No specific requirement
Class E	None for VFR	No specific requirement	No specific requirement
Class G	None	No specific requirement	No specific requirement
*Beginning January 1, 2020, ADS-B Out equipment may be required in accordance with 14 CFR part 91, section 91.225.			

Entry Requirements for Class G Airspace

Class Airspace	Entry Requirements	Equipment*	Minimum Pilot Certificate
Class A	ATC clearance	IFR equipped	Instrument rating
Class B	ATC clearance	Two-way radio, transponder with altitude reporting capability	Private—(However, a student or recreational pilot may operate at other than the primary airport if seeking private pilot certification and if regulatory requirements are met.)
Class C	Two-way radio communications prior to entry	Two-way radio, transponder with altitude reporting capability	No specific requirement
Class D	Two-way radio communications prior to entry	Two-way radio	No specific requirement
Class E	None for VFR	No specific requirement	No specific requirement
Class G	None	No specific requirement	No specific requirement
*Beginning January 1, 2020, ADS-B Out equipment may be required in accordance with 14 CFR part 91, section 91.225.			

ADS-B Requirements



Airspace Speed Limits

Airspace	Maximum Speed
A	Below local speed of sound
B	250 KIAS – Underlying or corridor – 200 KIAS
C	250 KIAS - If within 4nm below 2500 AGL – 200 KIAS
D	250 KIAS – If within 4nm below 2500 AGL -200 KIAS
E	< 10,000 MSL 250 KIAS – Above - < local speed of sound
G	250 KIAS

91.117: Aircraft Speed

91.817: Must operate below Mach 1 at all times

ADS-B Requirement – 91.225

Where ADS-B OUT is Required

In Class B and C airspace

Within a Class B Mode C Veil (30nm upward to 10,000 MSL)

Above Class B and C airspace upward to 10,000 MSL

Class E airspace above 10,000 MSL (Excludes airspace at and below 2,500 AGL)

Class E airspace at and above 3,000 MSL over the Gulf of Mexico within 12 nm of the US coastline

RVSM
Requirements
(FAR 91 Appendix G)

FAR 91 and AIM 4-6-1

FL 290 – FL 410

Provides 1000 separation

Increases airspace capability

Reduces fuel consumption

RVSM
Requirements
(FAR 91 Appendix G)

Equipment Required:

Dual Altimeters

Autopilot

Altitude Alert System

TCAS

RVSM Requirements

(FAR 91 Appendix G)

Oxygen Masks

At or below FL410

2 pilots -quick donning masks at controls
Not required to be worn

1 pilot is at the controls above FL 350
Required to be worn

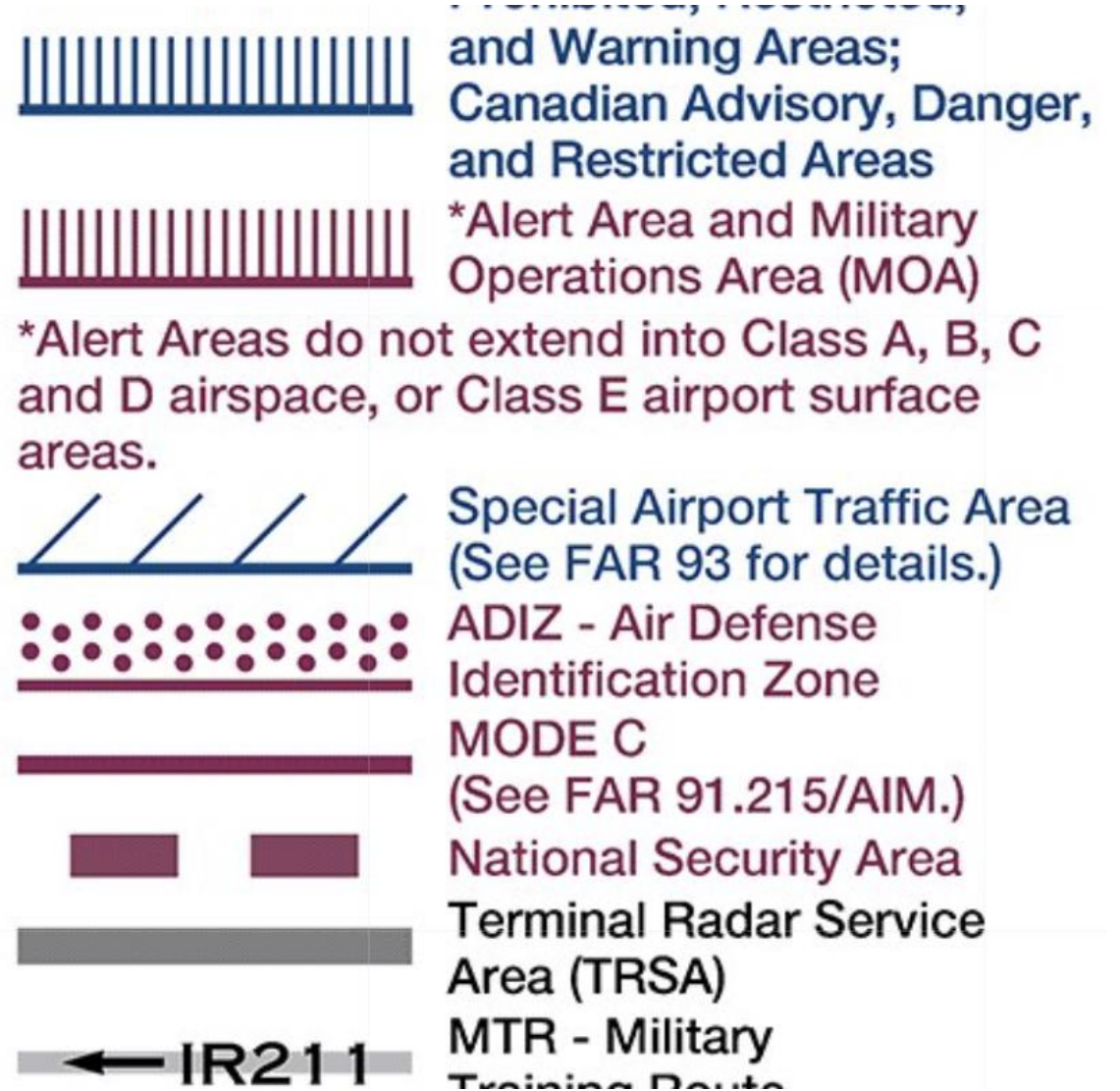
RVSM
Requirements
(FAR 91 Appendix G)

Oxygen requirements 91.211(b)

If Plane not RVSM capable
Inform ATC “Negative RVSM”

Special Use Airspace

Prohibited
Restricted
Alert
Warning



Special Use Airspace

Military Operations Area

- MOA

Controlled Firing Area

Special Flight Rules Area

- SFRAs



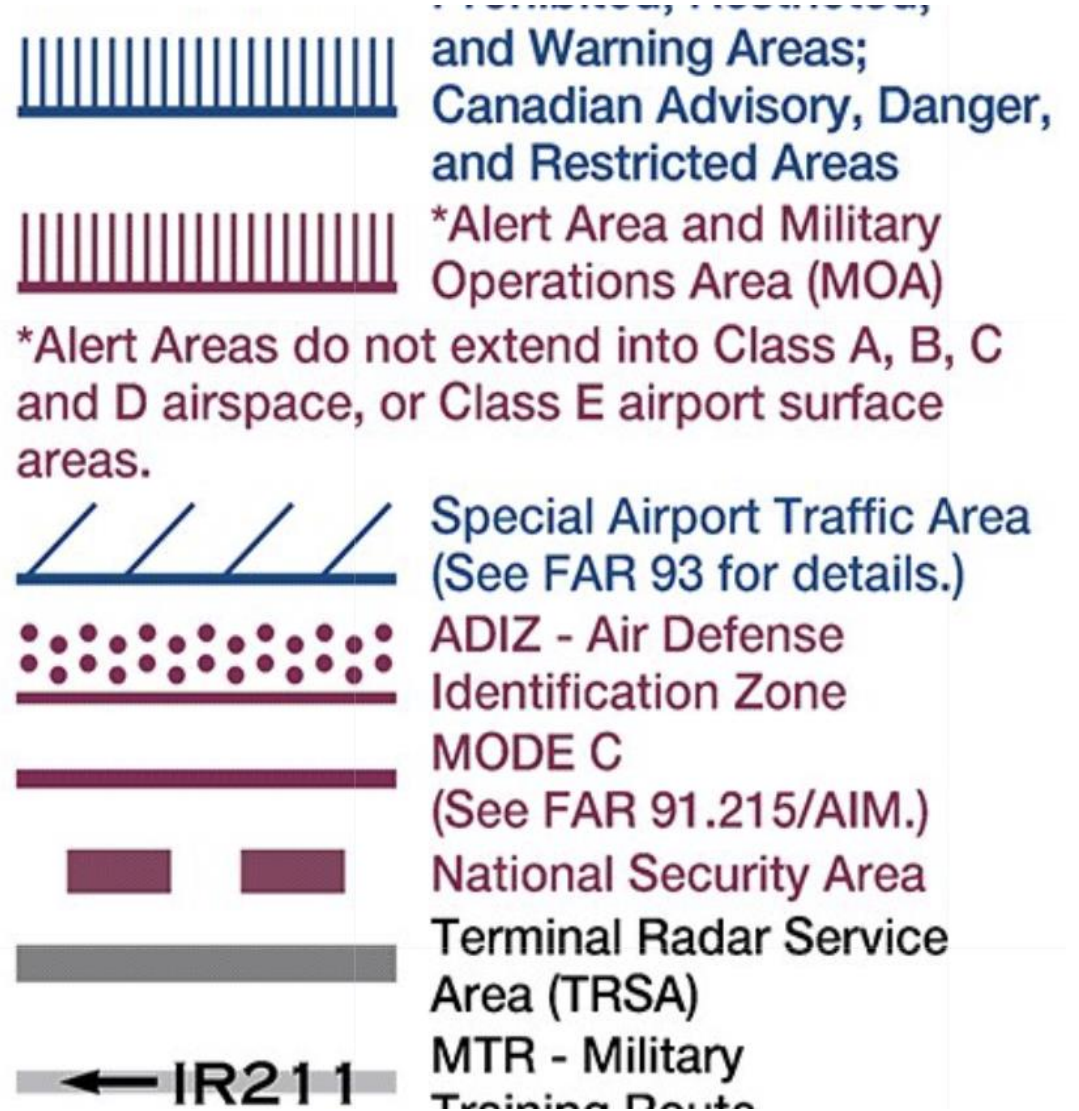
Special Use Airspace

TFRs

- Temporary flight restrictions

Military Training Routes

- MTRs



Prohibited Areas

No aircraft may enter



Restricted Areas

ATC clearance required
Not always authorized

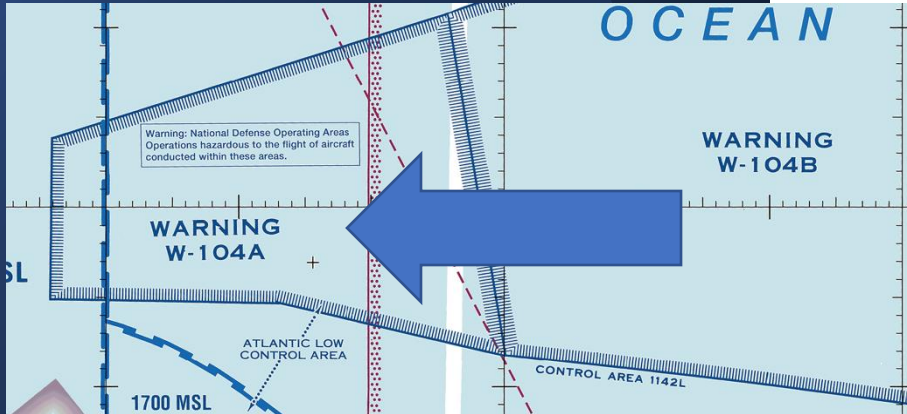


Alert Area



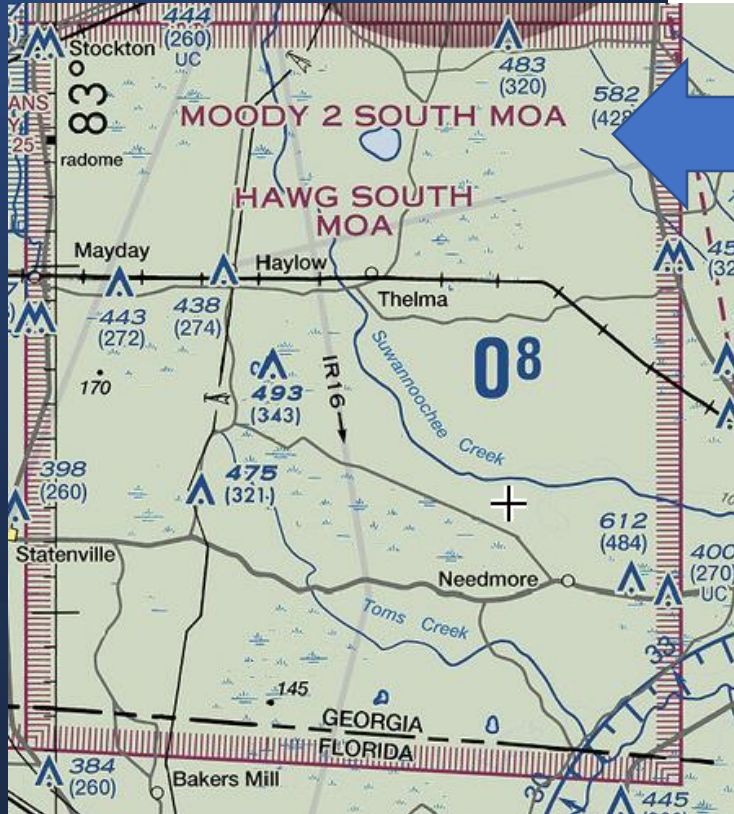
Intensive flight training area
No Clearance/Comm required

Warning Area



No Clearance/Comms required

Military Operations Area



Potential Military Activity

No Clearance/Comms required

Controlled Firing Area

Artillery practice areas

No Clearance/Comms required

Uses a spotter

Not charted



Controlled Firing Area at the Combat Center

Effective as of August 24, 2018 | Surface to 16,000 MSL

The Federal Aviation Administration has established a Controlled Firing Area (CFA) over the Marine Corps Air Ground Combat Center in Twentynine Palms, California, to support smaller-scale military training requirements without impacting civilian aviation. The CFA is active at all times and when in use, air sentries are posted and constantly monitoring for non-participating aircraft. Upon the approach of non-participating aircraft, training will go into a cease-fire status immediately until the aircraft is safely clear of the CFA, not to affect the pilot's flight path.

The Combat Center's CFA does not require general aviators to change their flight path.

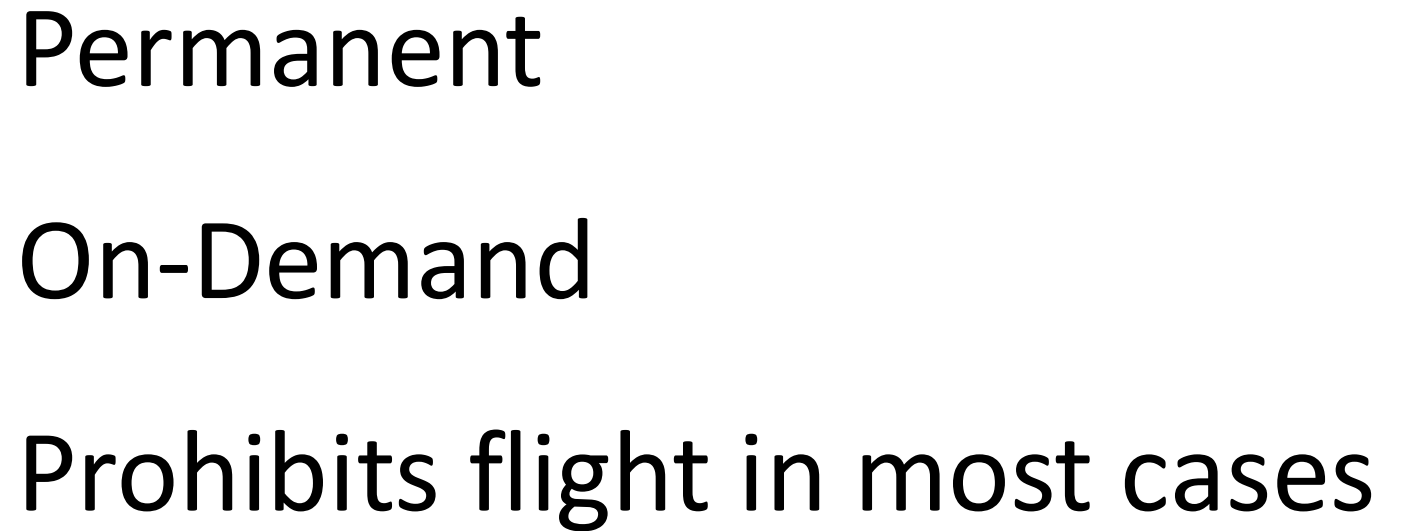
The Combat Center terminates activities in the CFA when non-participating aircraft approach the area.

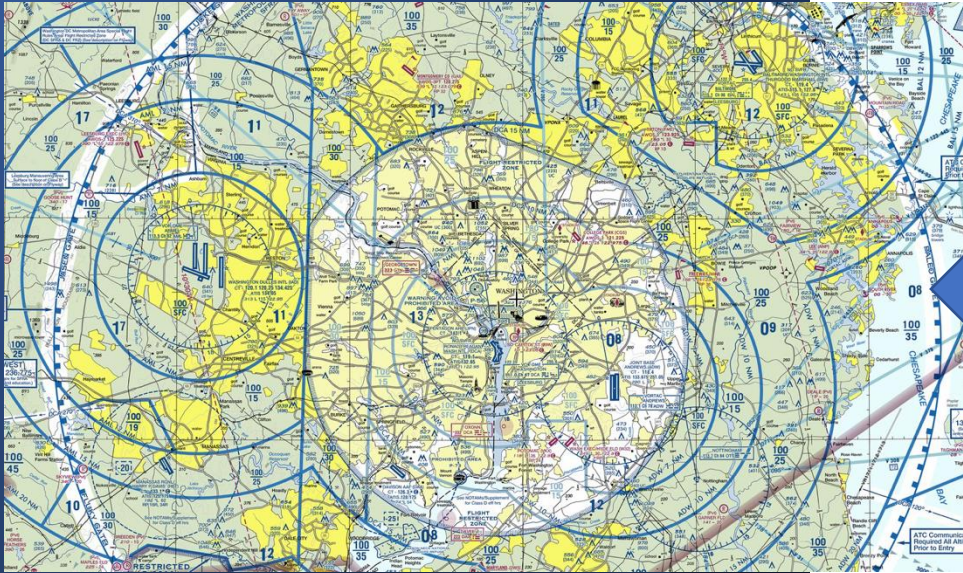
For this reason, CFA will not be depicted on aeronautical charts or published to Notices to Airmen (NOTAMS).

Contact 29 Palms Control (BEARMAT) on 127.125

Supported by GFA: Small Arms | Mortars | Artillery | UAS | Tanks | Fixed- and rotary-wing aircraft





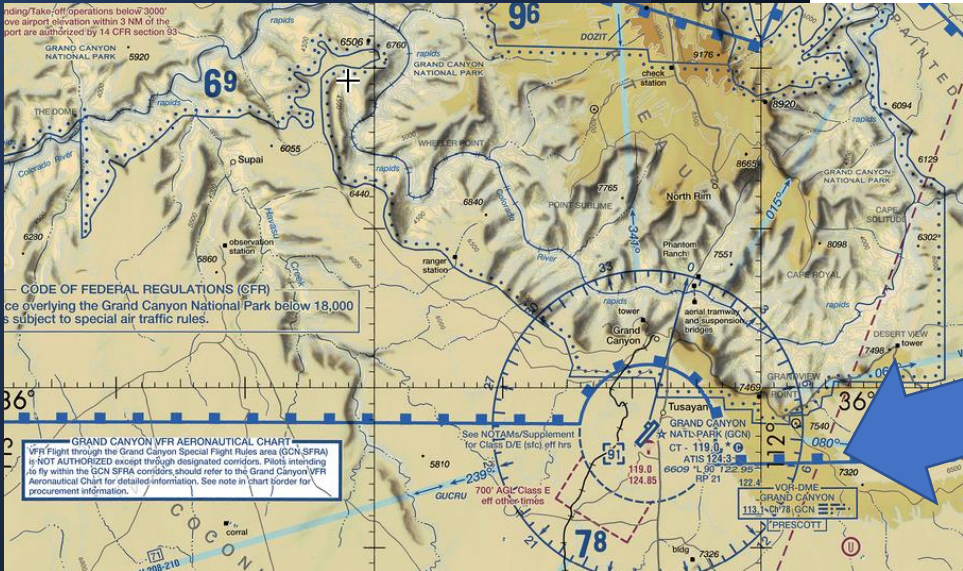


Special Flight Rules Area

Where special rules apply

Washington DC area

Grand Canyon area



Military Training Routes

VFR Routes

IFR Routes

Alternate training routes



IFR Military Training Routes

No segments above 1500 AGL
– 4 digits

Segments above 1500 AGL
– 3 digits



IFR Military Training Routes

Speeds in excess of 250 KIAS

Altitudes below 10,000 MSL

Example: IR1206 and IR306

VFR Military Training Routes

No segments above 1500 AGL
– 4 digits

Segments above 1500 AGL
- 3 digits

Speeds in excess of 250 KIAS

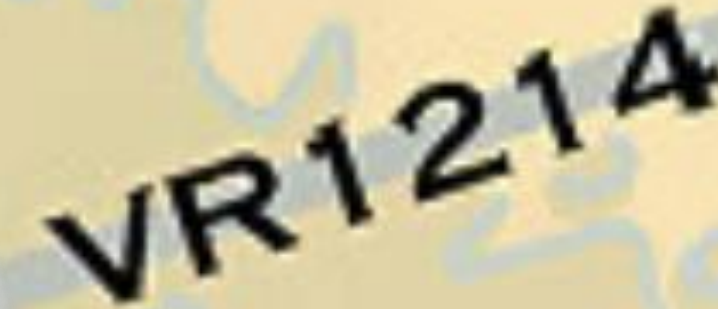


VFR Military Training Routes

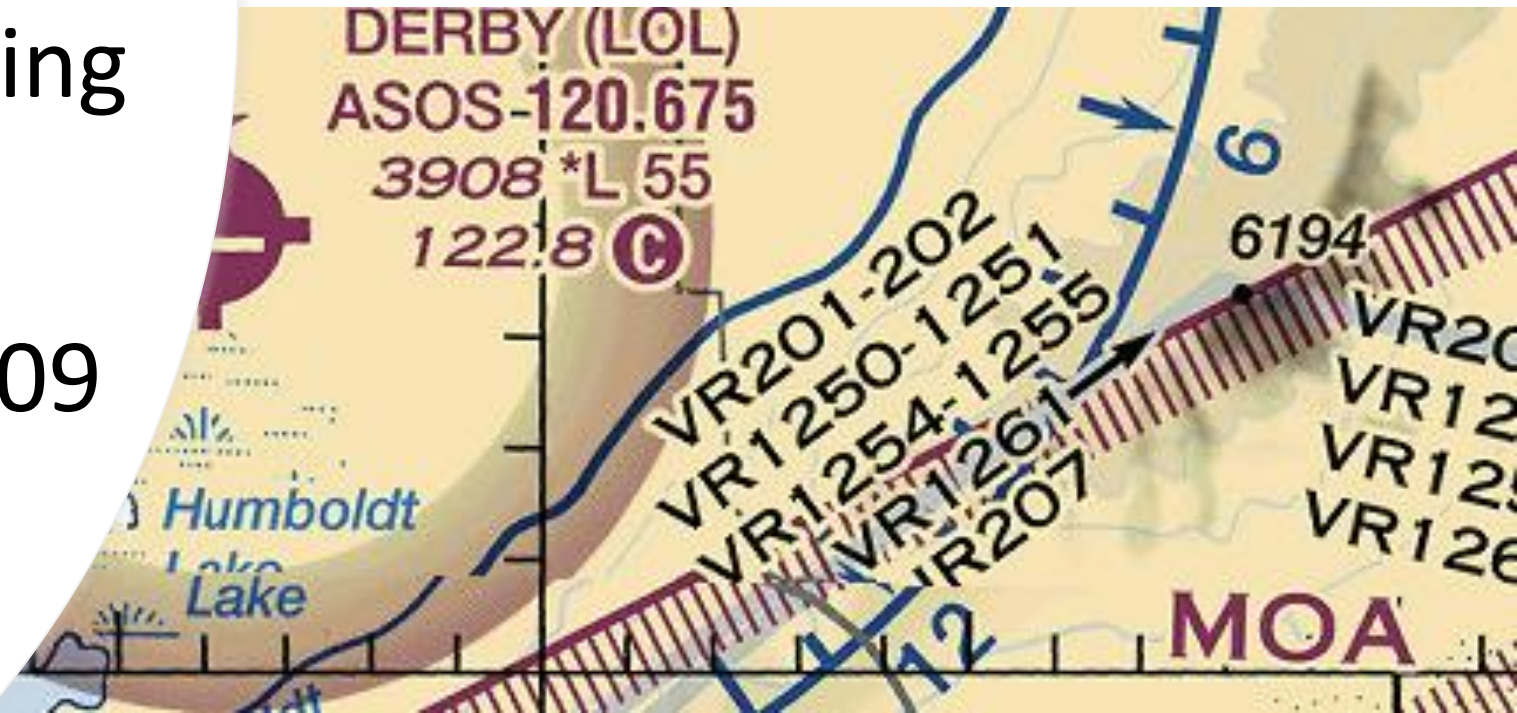
Altitudes < 10,000 MSL

Visibility \geq 5 miles ceiling
 \geq 3000 AGL

Example: VR1309/VR309



VR1214



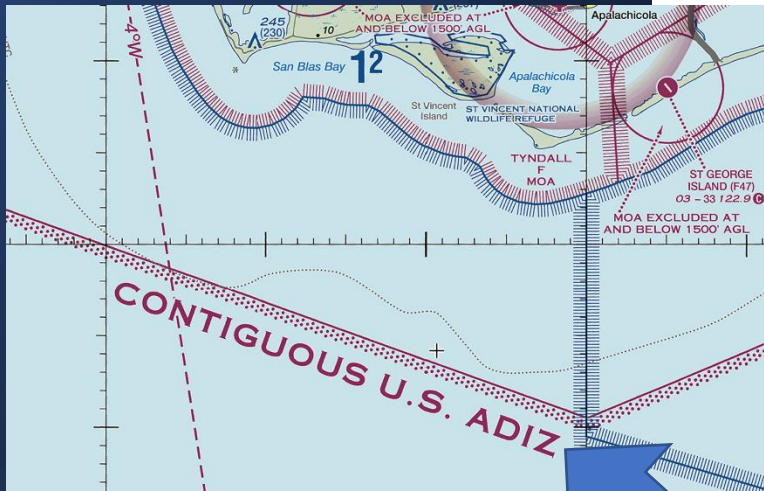
Alternate Military Training Routes

Same criteria for VR and IR

Will add a letter suffix to
the routes

Example: IR1206A/VR207B

Air Defense International Zone



Air defense international zone
(US border)

DVFR or IFR Flight plan

Must land at a point of entry

Resources

[Aeronautical Chart Users Guide](#)

[Pilot's Handbook of Aeronautical Knowledge](#)

[Airman Information Manual](#)

[FAR Part 71](#) and [FAR Part 91](#)