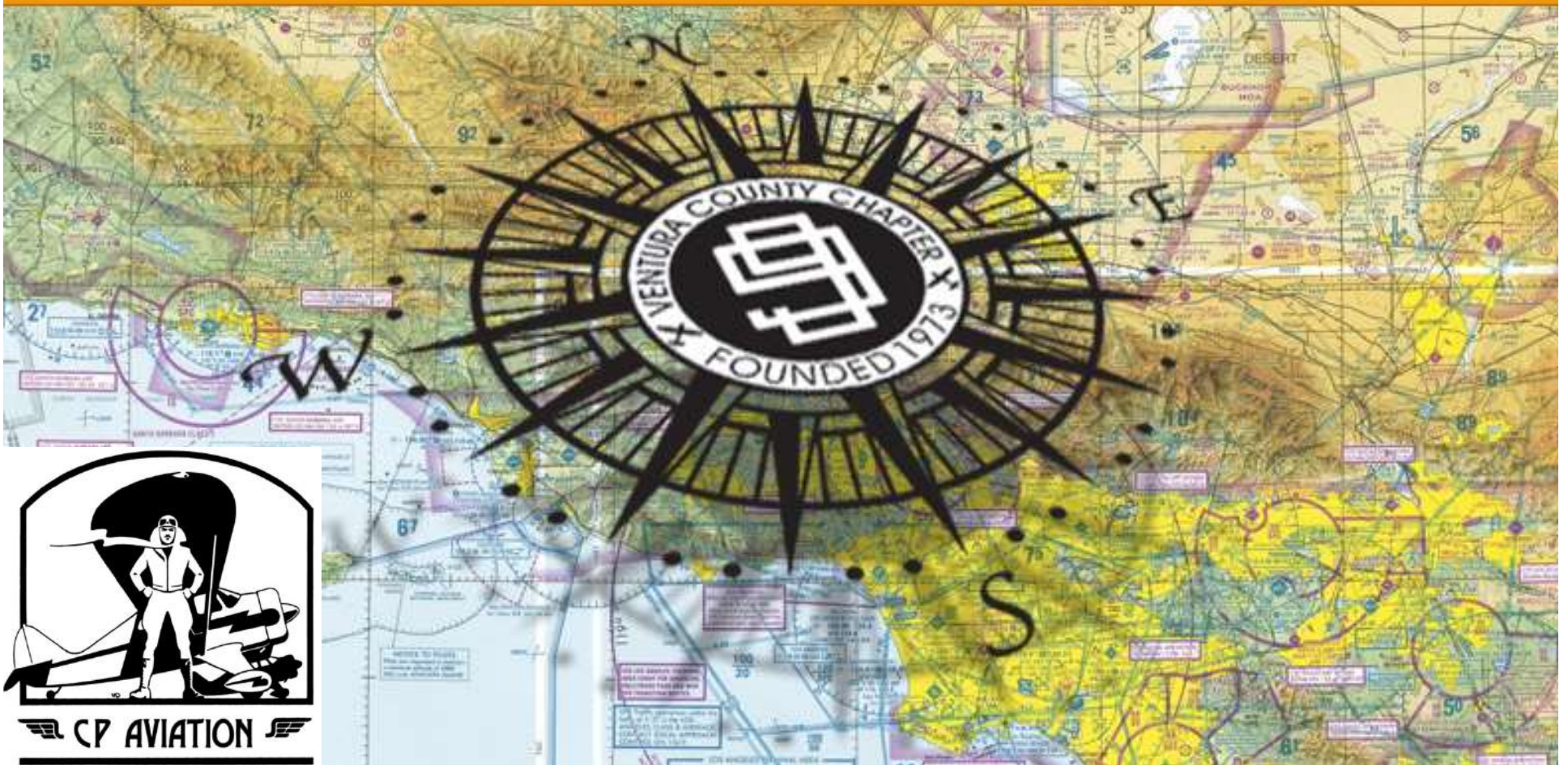


Charts/Airspace

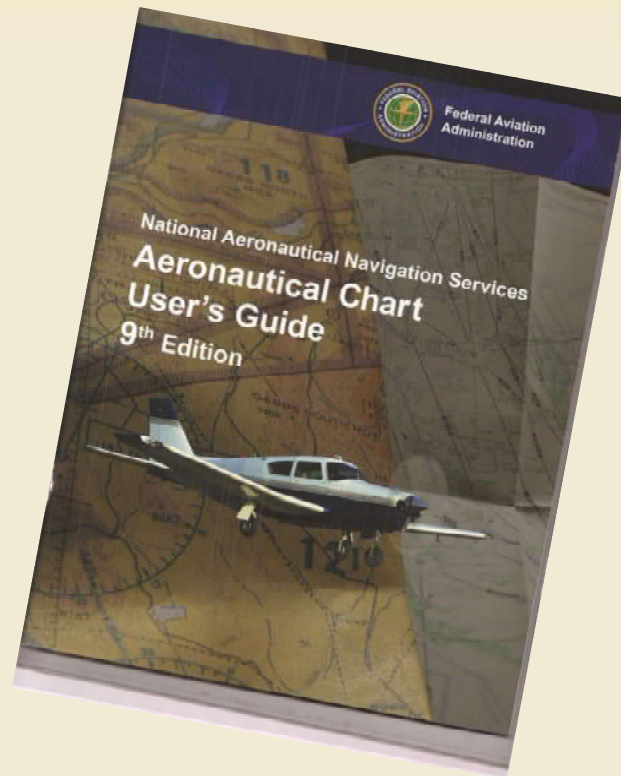
Judy Phelps ♦ Master CFI-Aerobatic, CFII



Aeronautical Charts

Charts provide information which allows pilots to track their position and provides information which enhances safety.

- Airport Data
- Navigation Aids
- Airspace
- Topography



And much more!

Types of VFR Charts

Sectional

- Most common
- Scale of 1:500,000 (1 inch = 6.86 Nautical miles (NM) or approximately 8 statute miles (SM))
- This allows for detailed information
- Updated semiannually

Types of Charts

Terminal Area Charts (TAC)

- Used for flying in or near Class B airspace
- Scale of 1:250,000 (1 inch = 3.43 NM or approximately 4 SM)
- Transition routes
- Updated semi-annually

Types of Charts

VFR Flyway Planning Charts

- On the back of the TAC
- Help VFR pilots avoid major traffic flows
- Depicts routing throughout the busy area
- Ground references for improved visual navigation
- Designed solely for planning purposes –not navigation!

Chart Supplement

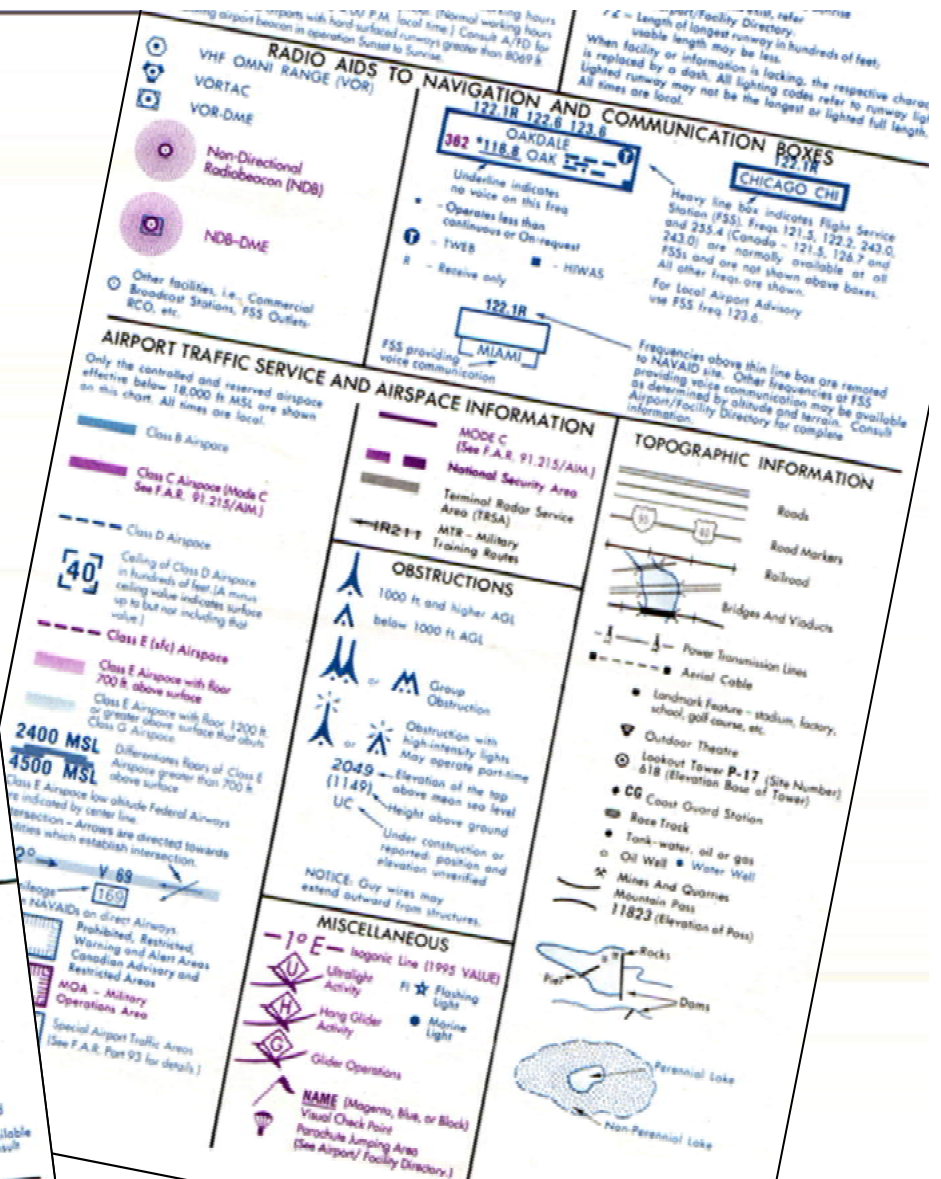
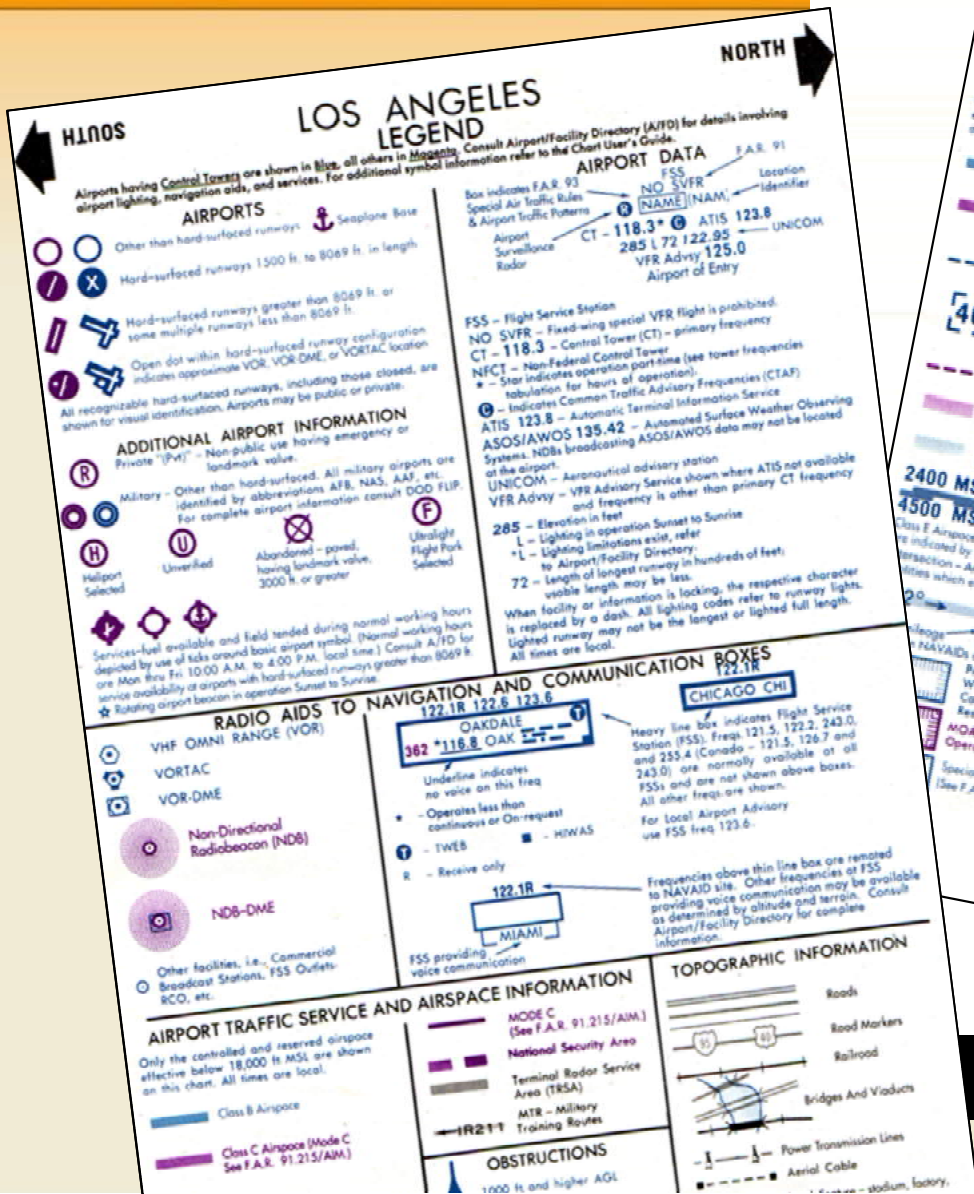
(Airport Facility Directory)

Use in conjunction with charts

- Airport information
- Phone numbers
- VFR waypoints
- LAHSO
- Airport diagrams for selected towered airports



Legends

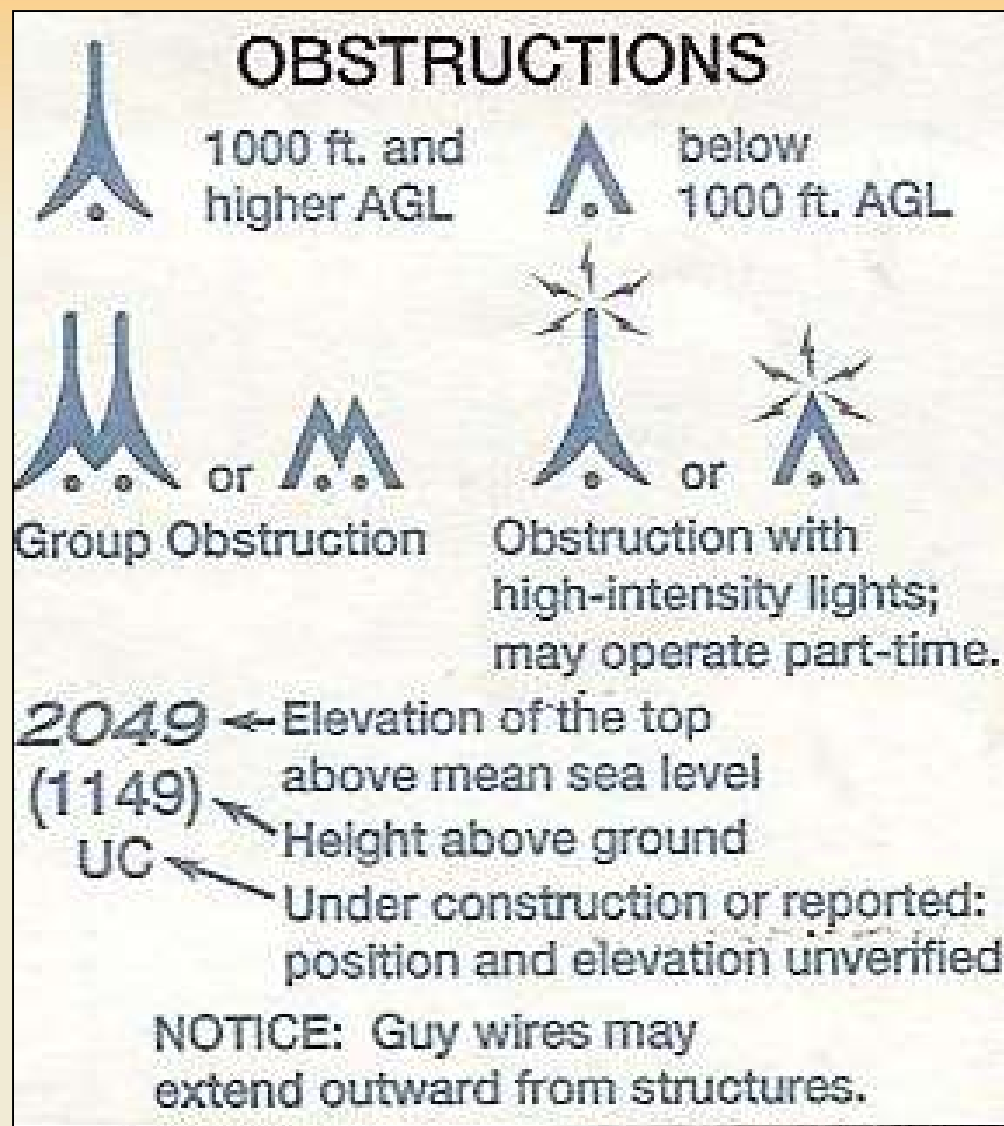


Aeronautical Charts

- Using obsolete charts is dangerous
- Information changes rapidly
- FDC NOTAMs – reflect changes



Aeronautical Charts



Aeronautical Charts

Obstructions on Sectional and TAC

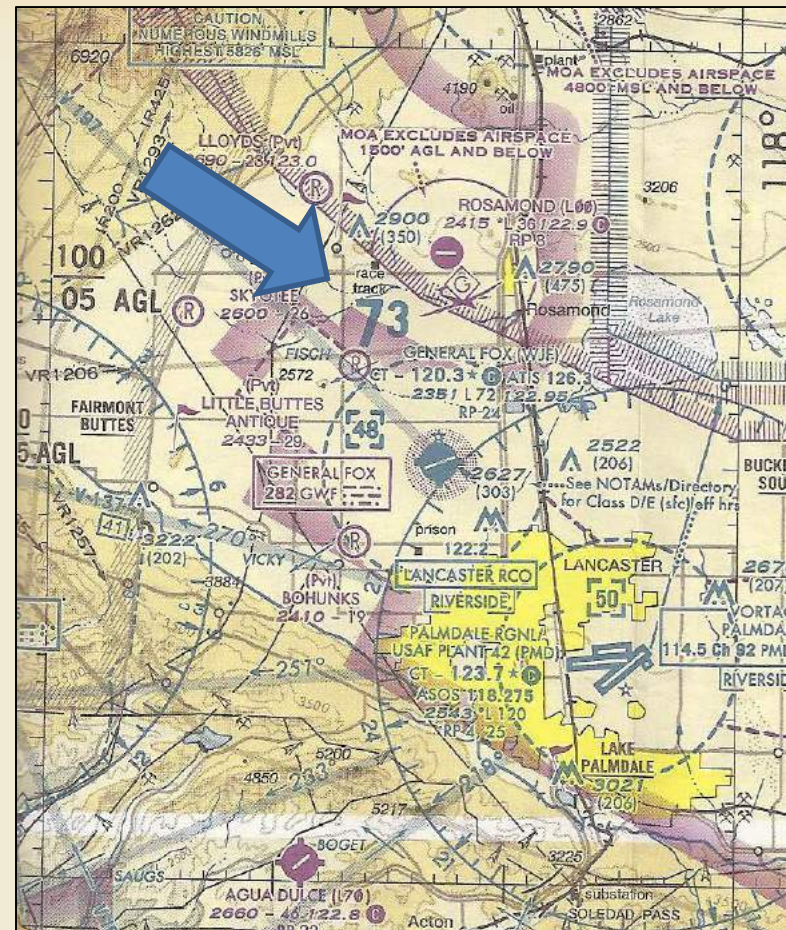
- Generally - 200' AGL are charted
- Objects less than 200' are charted only if considered a hazard very near an airport

Examples - smoke stacks, tanks, antennas

Aeronautical Charts

Maximum Elevation Figure

Highest Obstacle + 300'

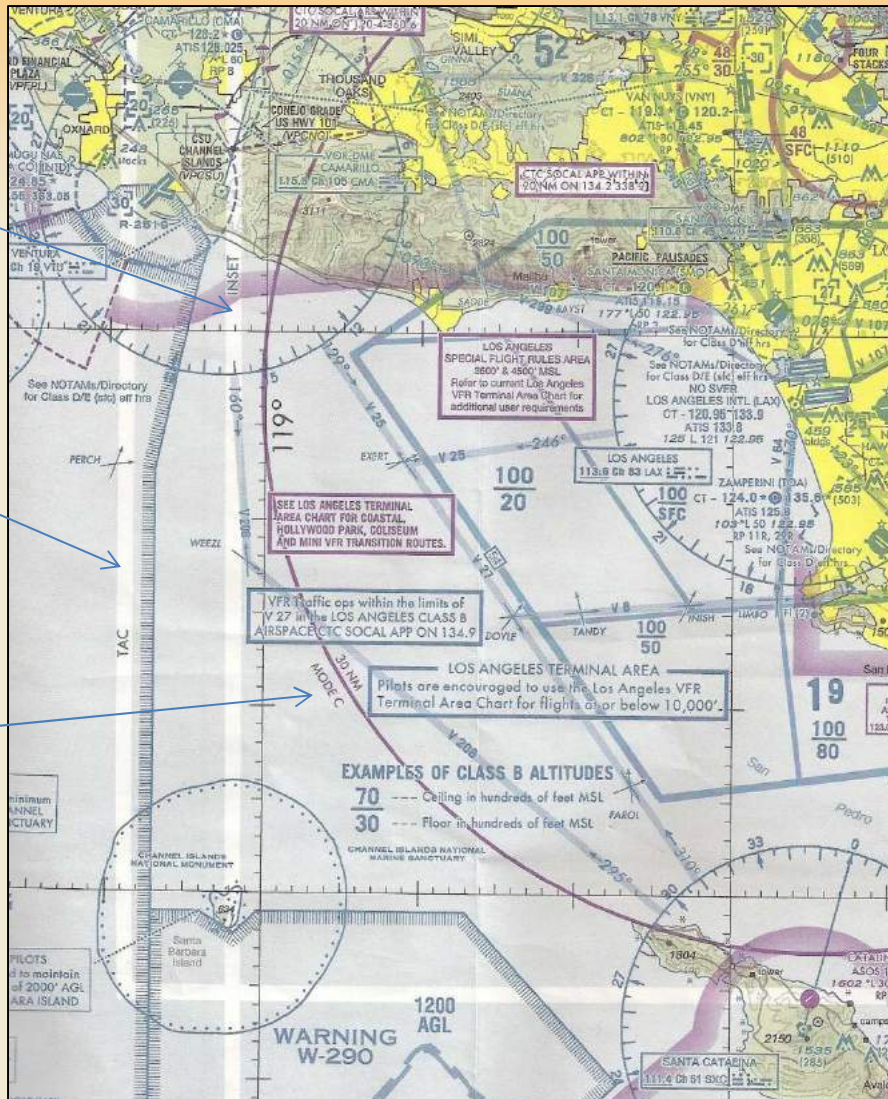


Aeronautical Charts

Inset

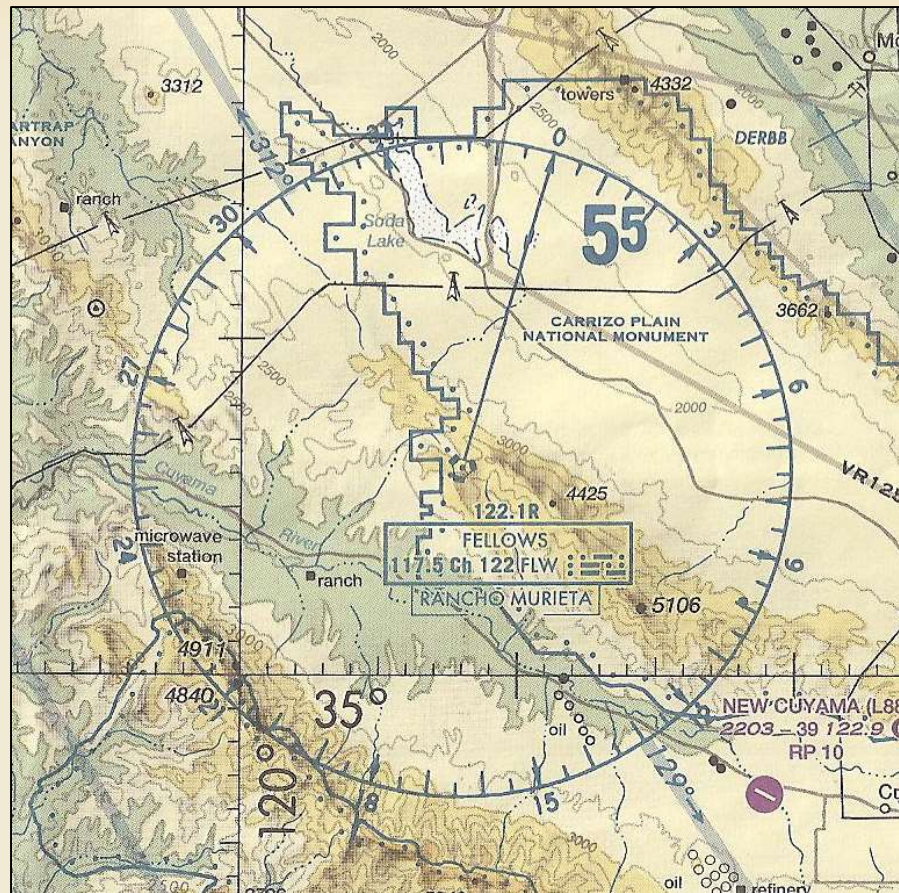
TAC

30 NM Mode C



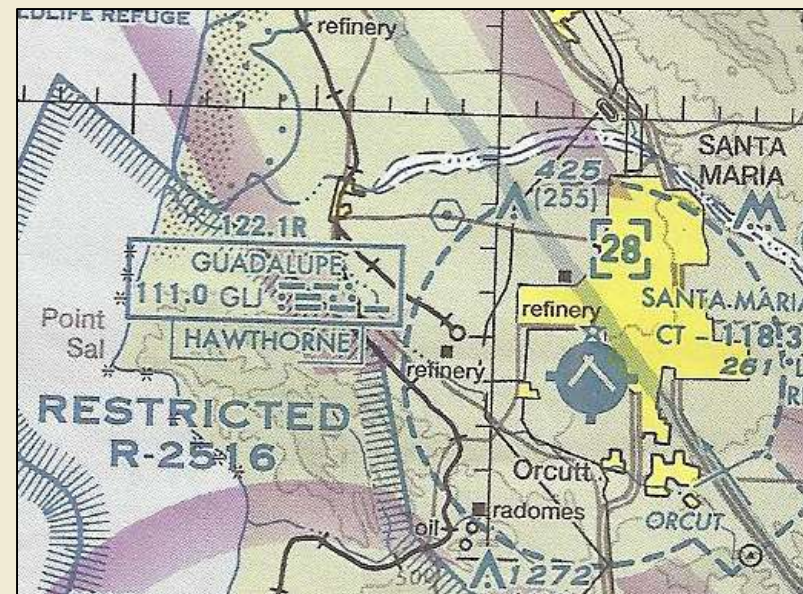
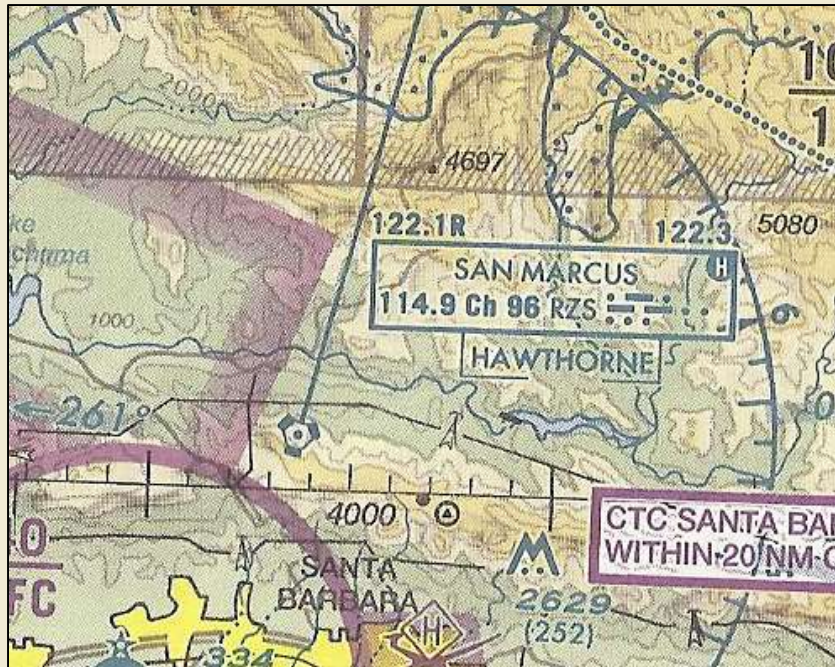
Aeronautical Charts

Compass Rose is oriented to Magnetic North



Aeronautical Charts

Radio Aids to Navigation

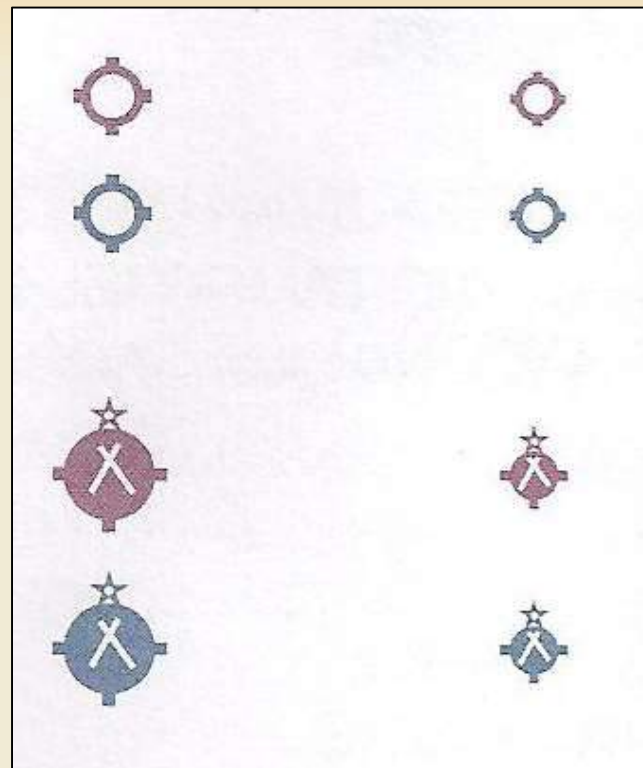


Aeronautical Charts

Public use airports

Blue - Control Tower

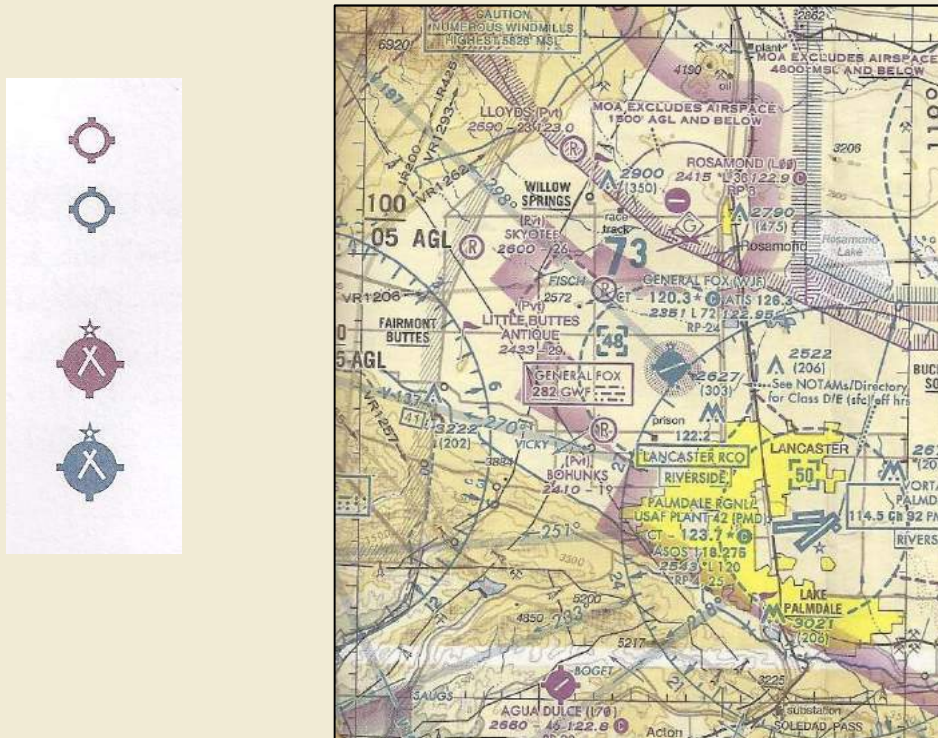
Magenta - No Tower



Aeronautical Charts

Services Available

Tick marks – fuel available



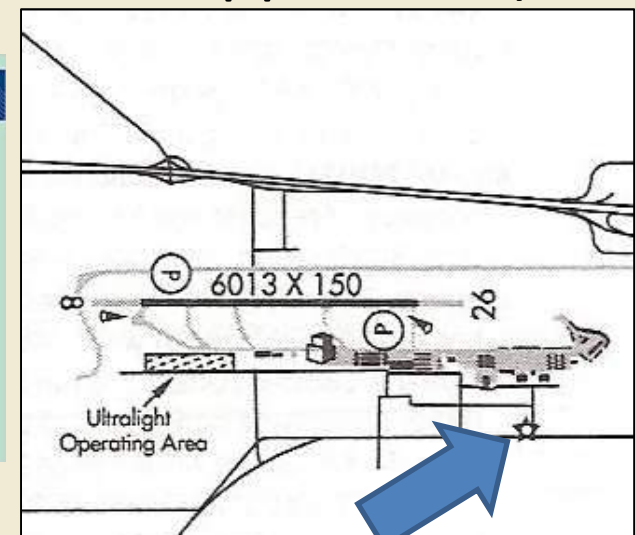
Aeronautical Charts

Rotating Beacon

Is there one (chart)

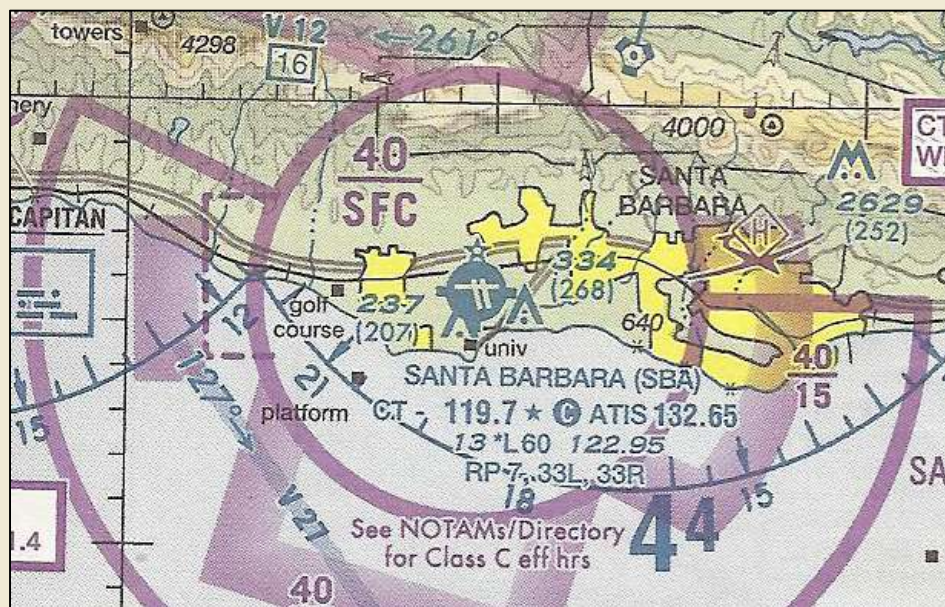


Where is it located on airport (Chart Supplement)



Aeronautical Charts

Airport Information



AIRPORT DATA

Box indicates FAR 93 Special Air Traffic Rules & Airport Traffic Patterns. Runways with Right Traffic Patterns (public use) RP * Special conditions exist - see A/FD.

FSS NO SVFR FAR 91 Location Identifier ICAO Location Indicator shown outside contiguous U.S.

NAME (NAM) (PNAM) CT - 118.3 * ATIS 123.8 285 L 72 122.95 RP 23, 34 VFR Advsy 125.0 UNICOM AOE Airport of Entry

FSS - Flight Service Station

NO SVFR - Fixed-wing special VFR flight is prohibited.

CT - 118.3 - Control Tower (CT) - primary frequency

* - Star indicates operation part-time. See tower frequencies tabulation for hours of operation.

© - Common Traffic Advisory Frequencies (CTAF)

ATIS 123.8 - Automatic Terminal Information Service

ASOS/AWOS 135.42 - Automated Surface Weather Observing Systems (shown where full-time ATIS not available). Some ASOS/AWOS facilities may not be located at airports.

UNICOM - Aeronautical advisory station

VFR Advsy - VFR Advisory Service shown where full-time ATIS not available and frequency is other than primary CT frequency.

285 - Elevation in feet

L - Lighting in operation Sunset to Sunrise

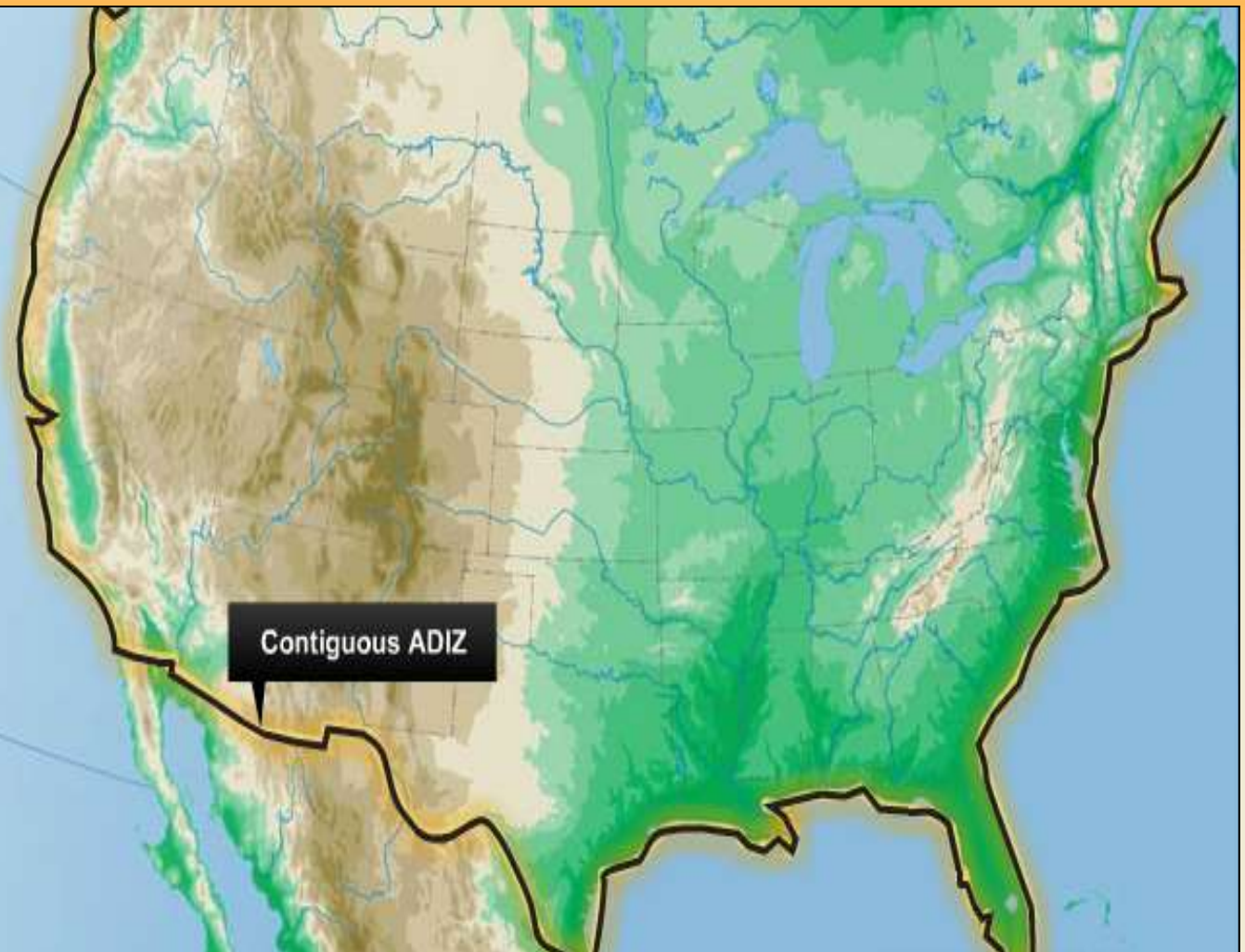
*L - Lighting limitations exist; refer to Airport/Facility Directory.

72 - Length of longest runway in hundreds of feet; usable length may be less.

When information is lacking, the respective character is replaced by a dash. Lighting codes refer to runway edge lights and may not represent the longest runway or full length lighting.

Air Defense Identification Zone

The contiguous Air Defense Identification Zone (ADIZ) is designed to allow ATC to identify aircraft in the vicinity of U.S. and international airspace boundaries.

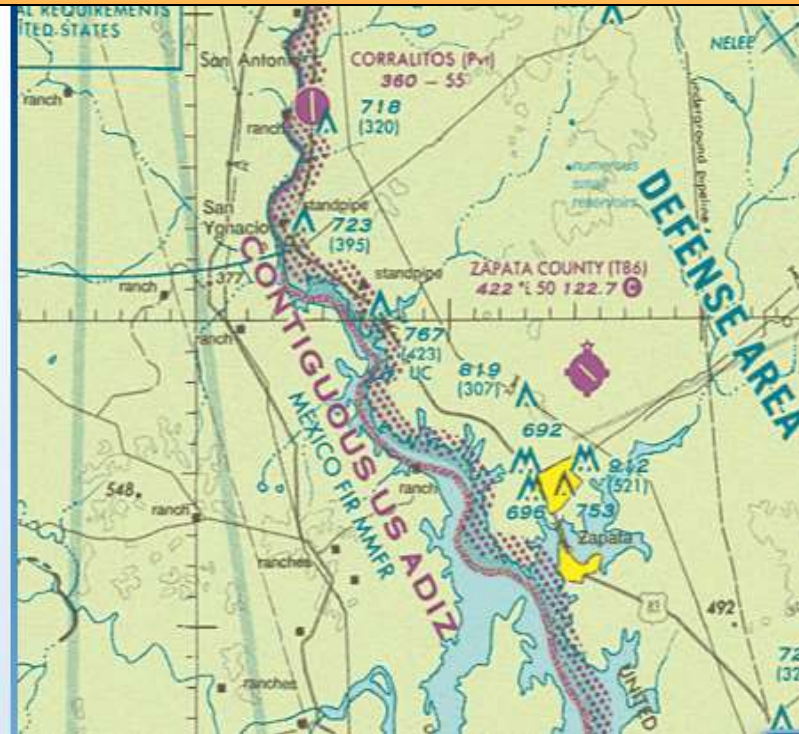


Contiguous ADIZ

The Contiguous ADIZ lies off the east and west U.S. coastlines and follows the U.S. - Mexico border. Aircraft crossing the ADIZ must:

- Be on an IFR or DVFR flight plan
- Be equipped with a two-way radio and Mode C transponder
- Have registration numbers at least 12" tall

See the **Learn More** for information about international travel requirements.



Contiguous ADIZ

The Contiguous ADIZ lies off the east and west U.S. coastlines and follows the U.S. - Mexico border. Aircraft entering the ADIZ must:

- Be on an IFR or DVFR flight plan
- Be equipped with a two-way radio and Mode C transponder
- Have registration number painted on the aircraft, at least 12" tall

See the **Learn More** for information on international travel requirements.



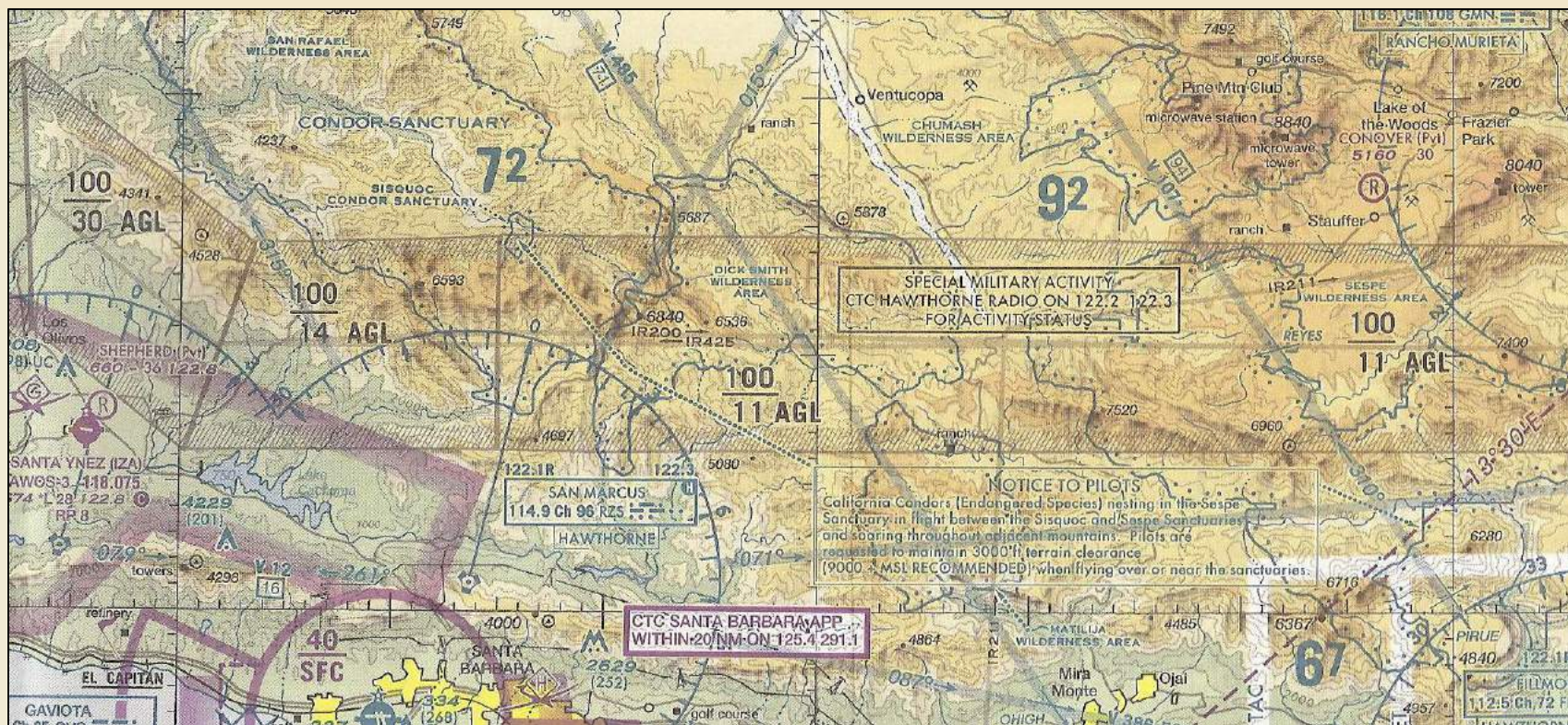
TIP:

International travel with a "pink slip," or temporary aircraft registration, is prohibited by law. When planning an international trip with a newly purchased aircraft, a permanent registration certificate from the FAA must be on board before crossing the border.



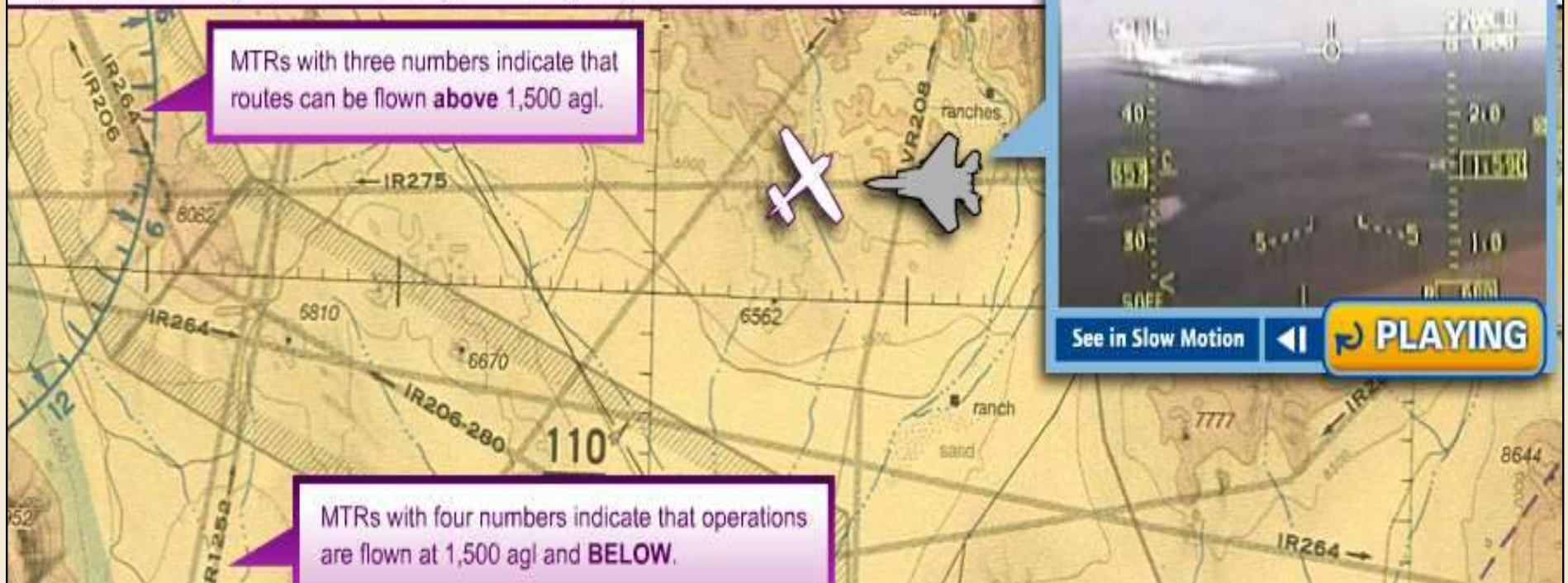
Aeronautical Charts

Military Training Routes (MTRs), AIM 3-5-2



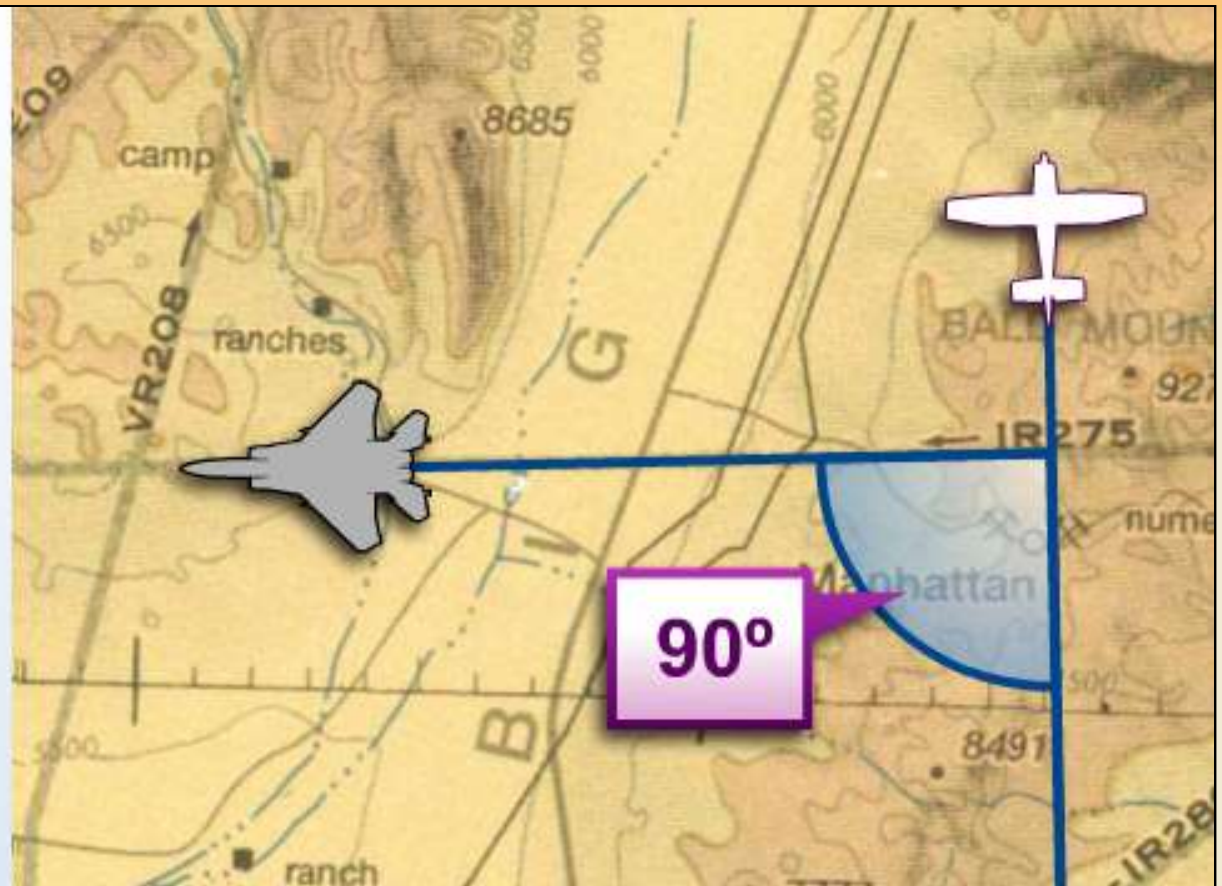
Military Training Routes (MTRs)

Military Training Routes (MTRs) were developed to conduct low-altitude, high-speed training. Operations along MTRs regularly exceed 250 knots.



Flying Near MTRs

If your route takes you near or over an MTR, cross it at a 90-degree angle to spend as little time as possible exposed to the high-speed traffic.



Flying Near

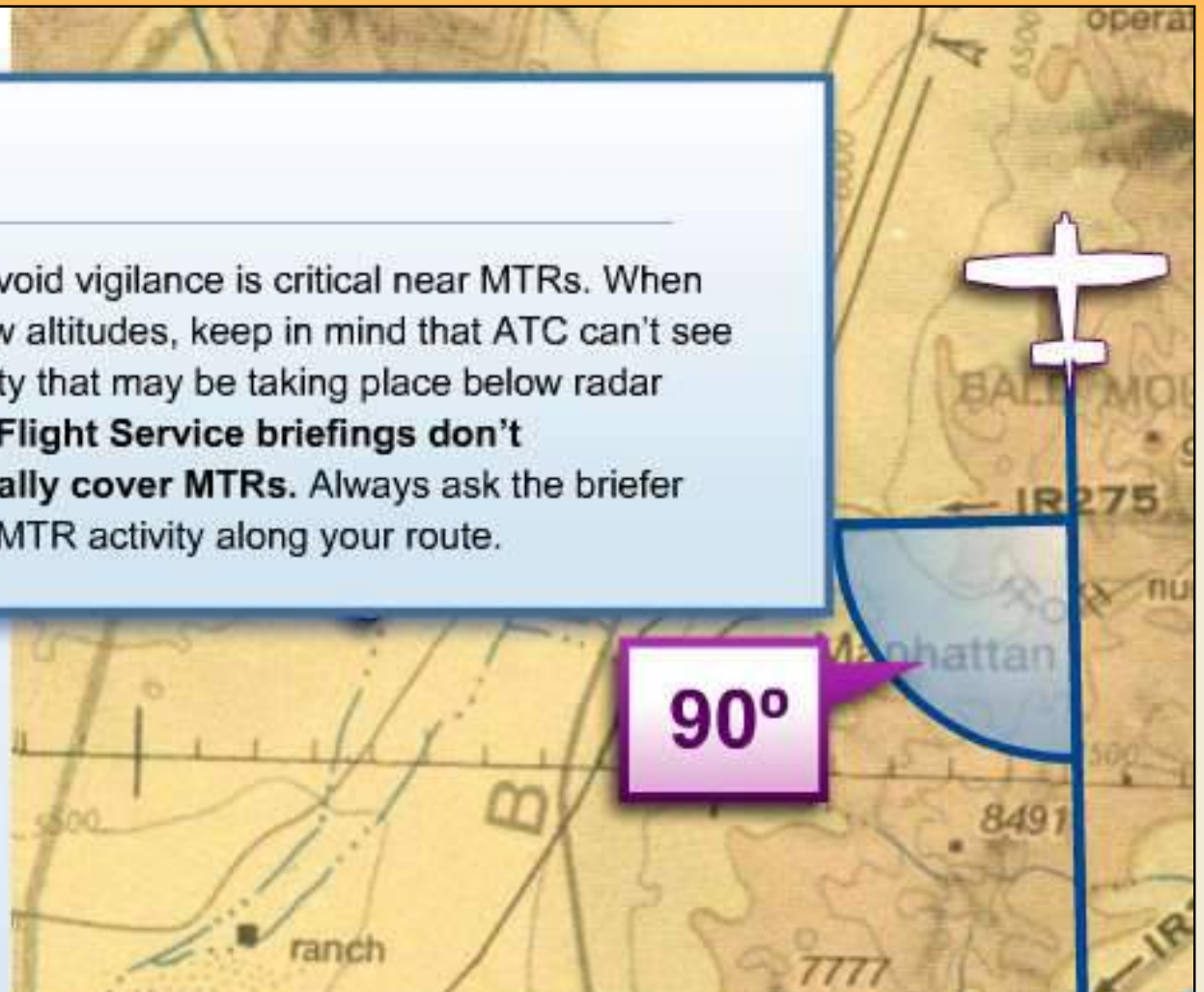
If your route takes over an MTR, cross degree angle to spend time as possible and high-speed traffic.

TIP:

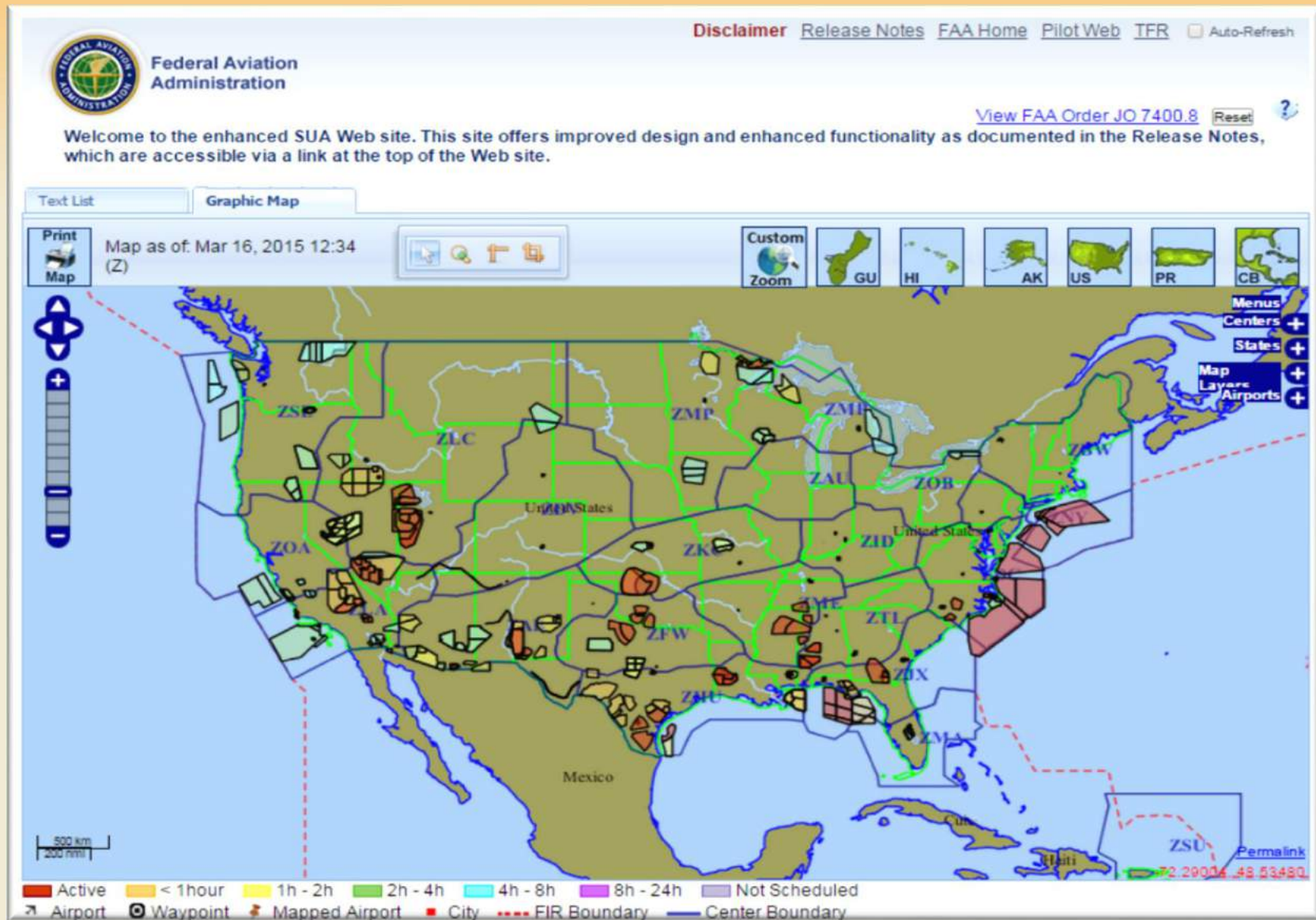
See-and-avoid vigilance is critical near MTRs. When flying at low altitudes, keep in mind that ATC can't see MTR activity that may be taking place below radar coverage. **Flight Service briefings don't automatically cover MTRs.** Always ask the briefer about any MTR activity along your route.



90°



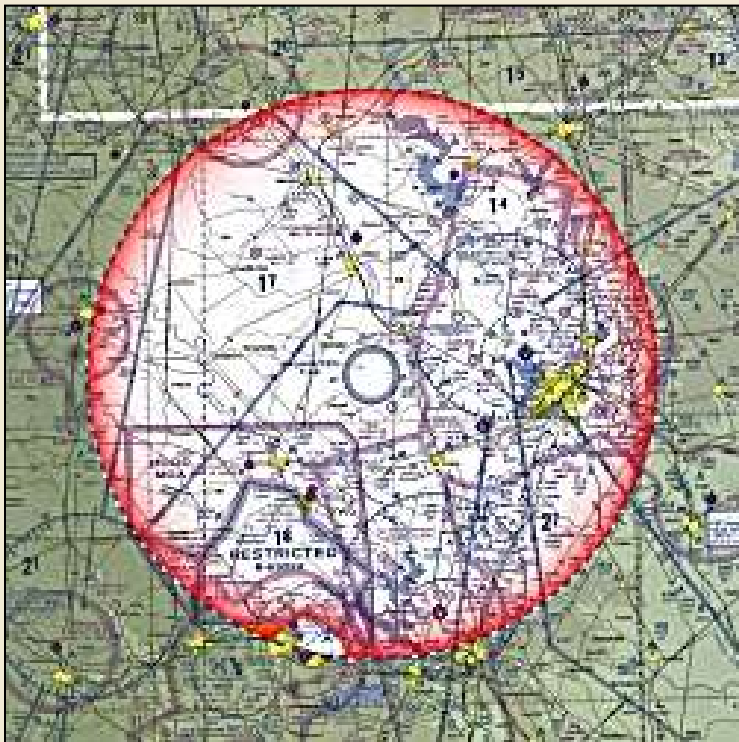
Special Use



Temporary Flight Restrictions (TFRs)

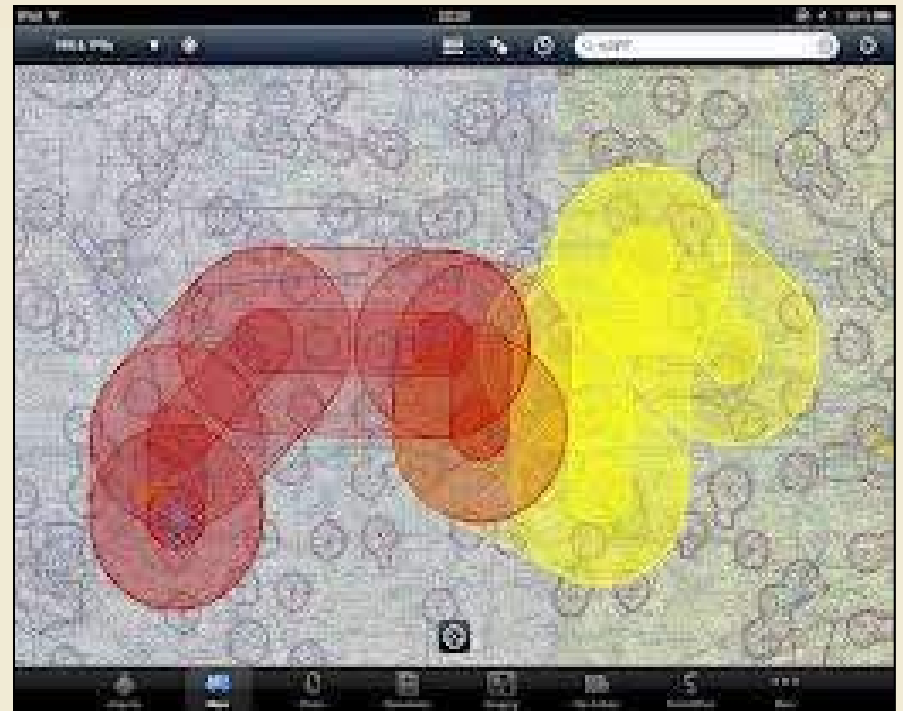
Other TFRs

- Sporting events (3 mi/3000 ft)
- Other places (Disneyworld, Super Bowl, UN General Assembly)



Presidential TFRs

- Can pop up anytime, and on very short notice. Virtually zero tolerance for incursions.



The official sources for TFR information are the [FAA's Graphic TFR web page](#) and the FDC NOTAMs.

Prohibited Areas

Prohibited Areas are usually established for security or other reasons associated with the national welfare. P=Prohibited: **Do not fly here!** Specific information for each area is provided on the inside chart panel of VFR and IFR charts.

Chart

Panel

◀ Click on each tab for more information.



Prohibited areas can be established for reasons other than national security, such as protecting the Boundary Waters Canoe Wilderness Area in Minnesota.

- Dimensions can also be expanded by notam (notice)

Restricted Areas

Restricted Areas indicate the existence of unusual, often invisible, hazards such as:

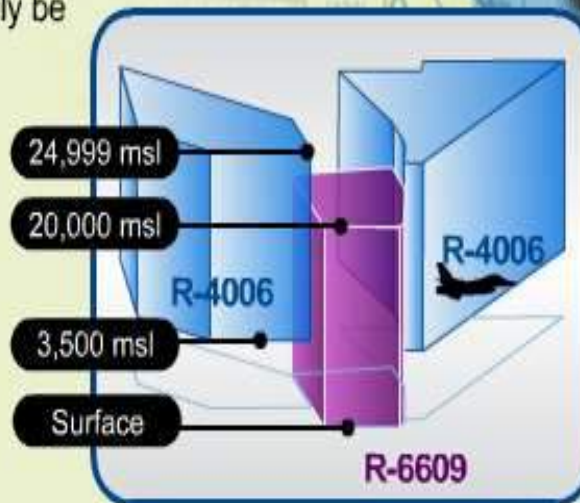
- Artillery firing
- Aerial combat
- Guided missiles

Flight through a Restricted Area can be authorized, but will most likely be denied if the area is "hot".

See the *Learn More* for additional information on controlling agencies.

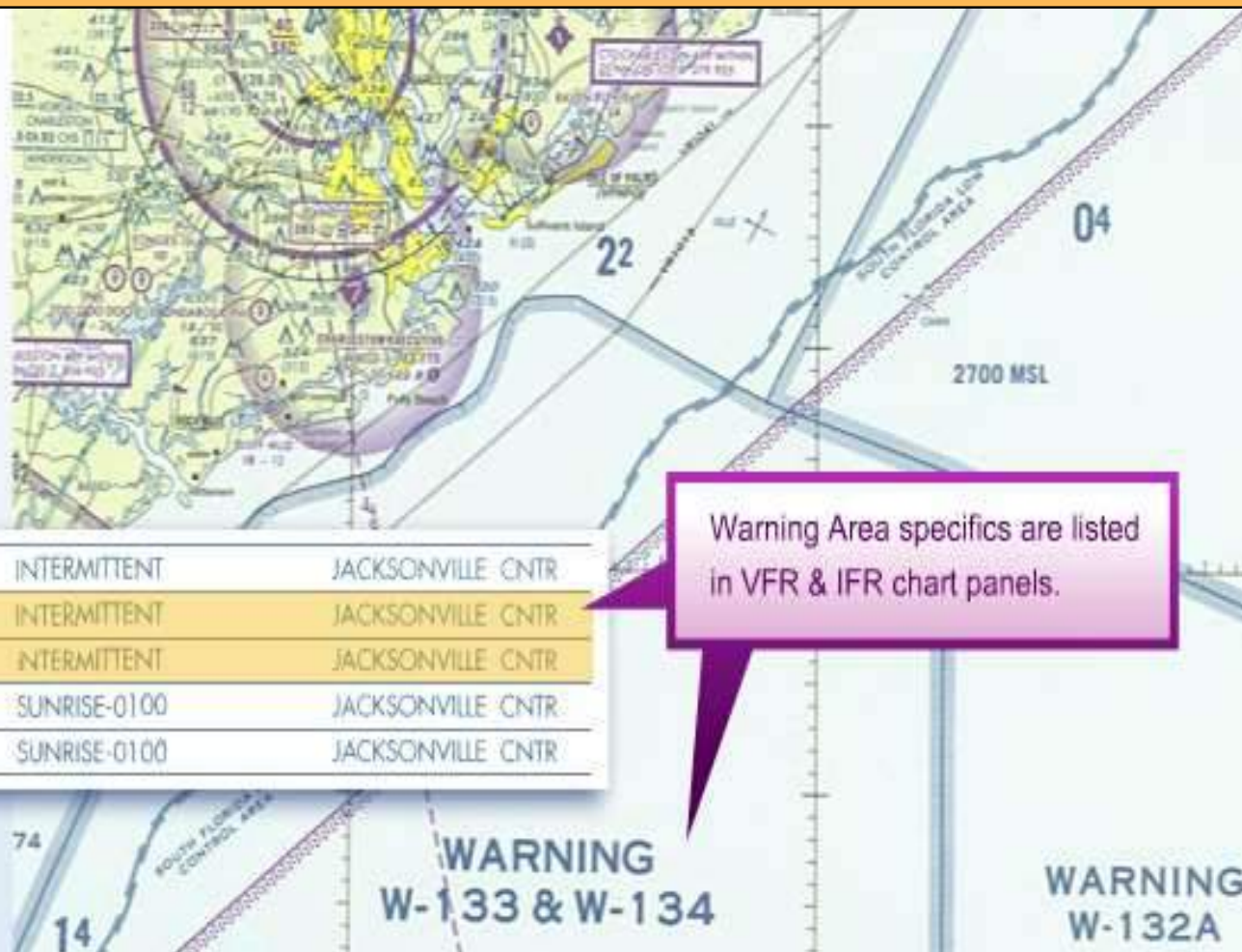
Restricted areas are either "hot/active" or "cold/inactive."

R-4006	3500 TO BUT NOT INCL FL 250	0700-2300† EXCLD R-4002, R-4005 AND R-6609	WASHINGTON CNTR	133.9 281.4
R-6609	TO FL 200	0800-2300 †48 HRS IN ADVANCE	WASHINGTON CNTR	132.55 256.8



Warning Areas

Warning Areas contain activities that may be hazardous to aircraft, such as air-to-air intercept training and live missile firing. They normally extend outward from 3 nm off the U.S. coast.



Alert Areas

Alert Areas contain a high volume of pilot training or some other type of unusual activity. Flight through an Alert Area is not restricted, but pilots should exercise caution when flying in these areas.



Alert Area specifics are listed in VFR & IFR chart panels.

R-2916	TO 14,000	CONTINUOUS	MIAMI CNTR
R-2936	TO 10,000	INTERMITTENT BY NOTAM	PALM BEACH ATCT
A-291 A,C	TO 2500	0600-2400	NO A/G
A-291 B,D	TO 3900	0600-2400	NO A/G
W-168	UNLIMITED	INTERMITTENT	MIAMI CNTR
W-174 A,F	TO FL 700	INTERMITTENT 0700-2300	MIAMI CNTR
W-174 B,C	TO FL 700	INTERMITTENT 0700-2300†	MIAMI CNTR
W-174 E	TO 10,000	INTERMITTENT 0700-2300†	MIAMI CNTR
W-174 G	TO FL 700	INTERMITTENT 0700-2300†	MIAMI CNTR

Military Operations Areas (MOAs)

MOAs contain activities such as air combat tactics and aerobatics, with some operations exceeding 250 knots near the surface. They exist to separate military training activities from IFR traffic, which is normally routed outside active MOAs. VFR traffic is permitted, but extreme caution should be used when these areas are active.



Roll over each area below to review



MOA specifics are listed in VFR & IFR chart panels.



SNOOPY WEST	6000	BY NOTAM NORMALLY INTERMITTENT 0800-2200 MON-SAT	MINNEAPOLIS CNTR	127.9 281.45
VOLK EAST	8000	INTERMITTENT BY NOTAM 0800-1600 TUE-SAT	CHICAGO CNTR	133.3 380.35
VOLK SOUTH	500 AGL	INTERMITTENT BY NOTAM 0800-1600 TUE-SAT	CHICAGO CNTR	133.3 380.35
VOLK WEST	100 AGL	INTERMITTENT BY NOTAM 800-1600 TUE-SAT	MINNEAPOLIS CNTR	124.4 128.6 317.7 363.0

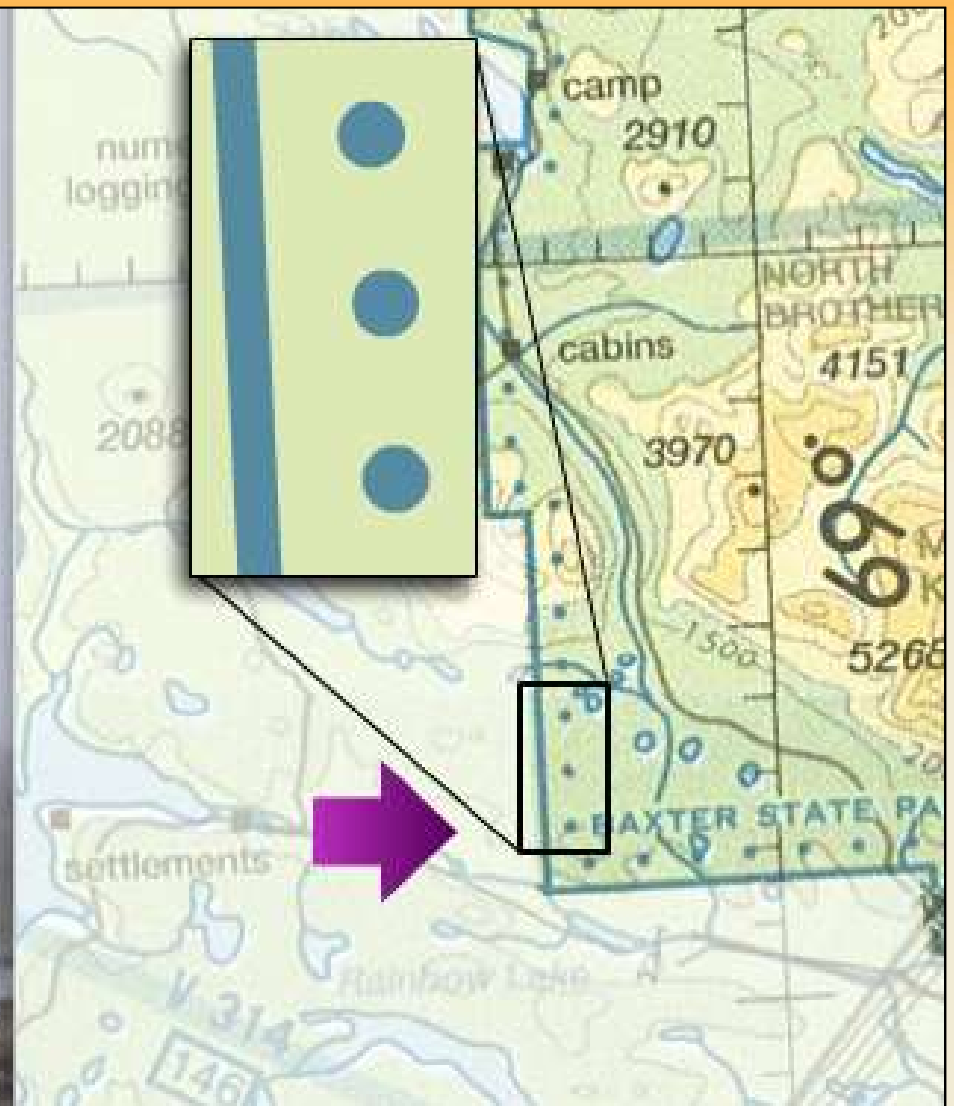
*Altitudes indicate floor of MOA. All MOAs extend to but do not include FL 180 unless otherwise indicated in tabulation or on chart.

†Other times by DoD NOTAM.

Special Conservation Areas

Pilots are recommended to stay at least 2,000 agl above these areas:

- National Parks
- Wildlife Refuges
- Wilderness Areas
- National Monuments
- Recreation Areas

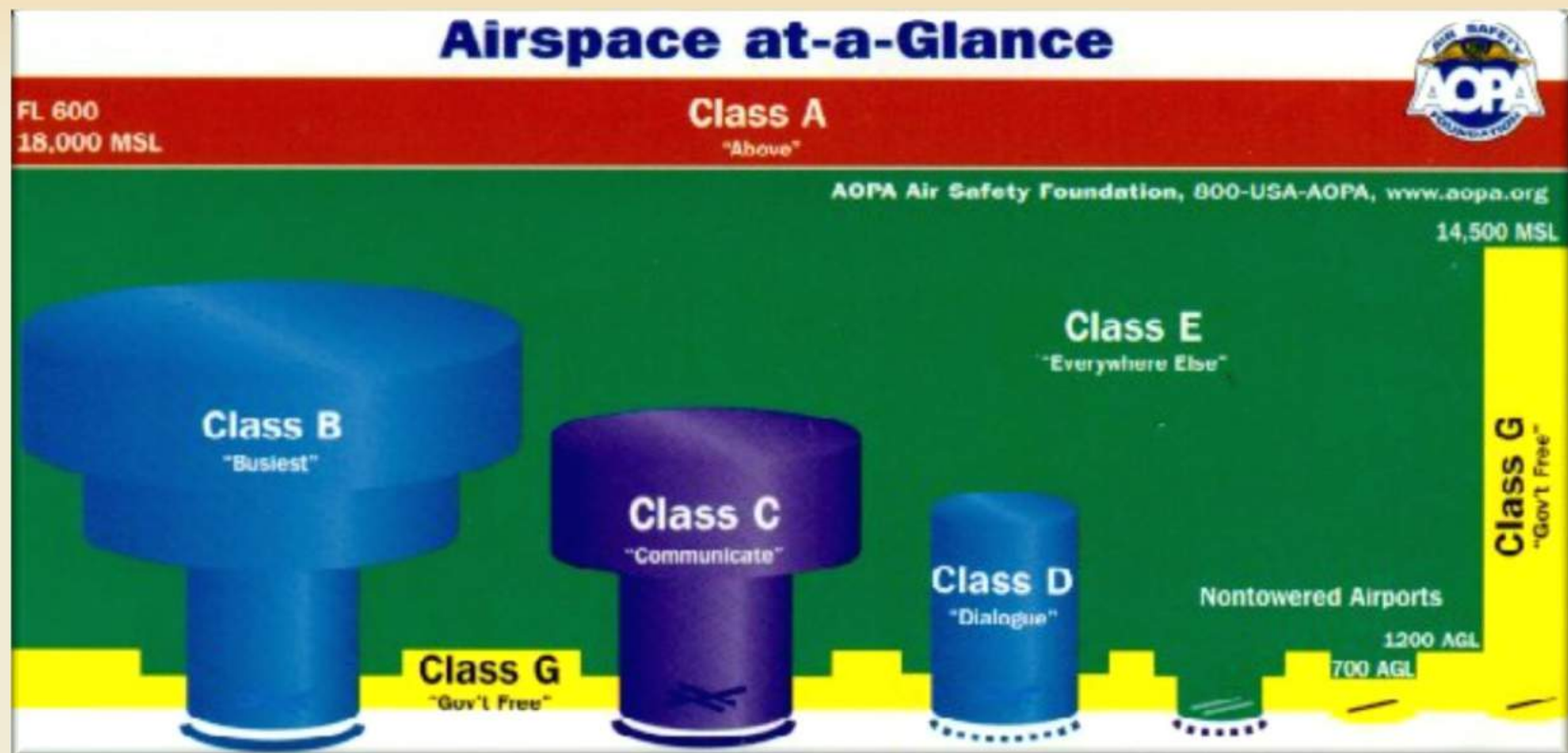




Airspace

- Identifying Airspace
 - Uncontrolled
 - Controlled
- Cloud Clearance and Visibility
- Speed Limits
- Equipment
- Special Use

Why?



A

Controlled Airspace

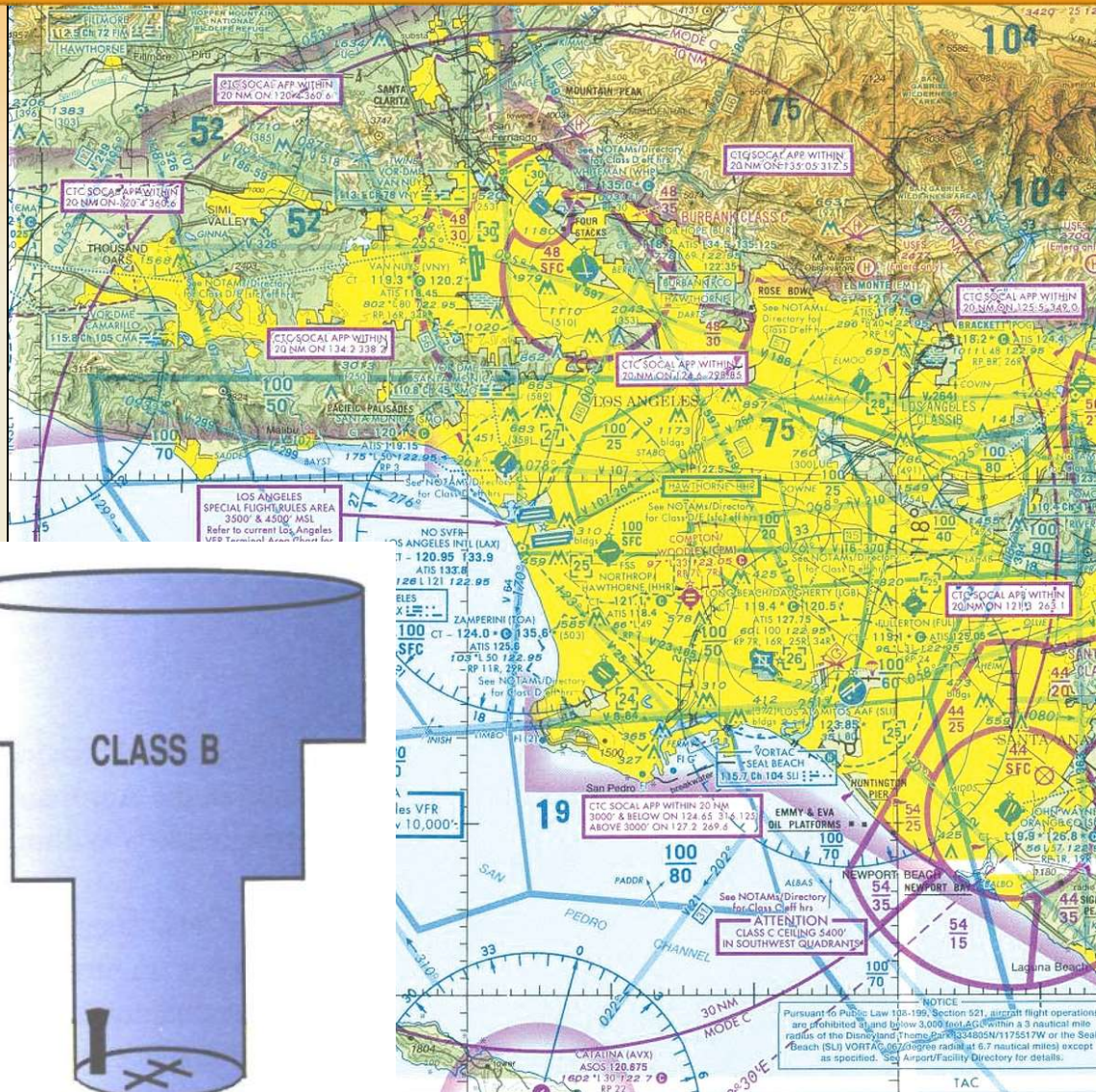
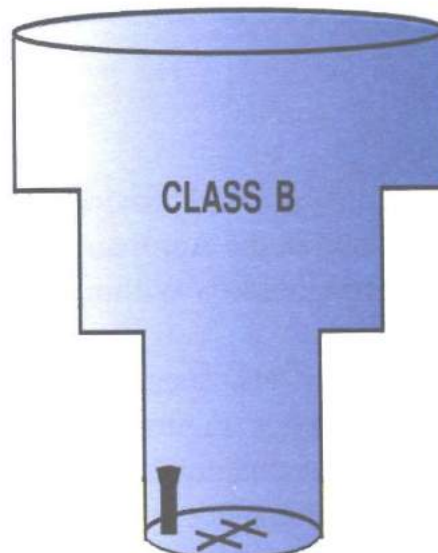
- 18000' MSL + to FL600
- IFR



Controlled Airspace

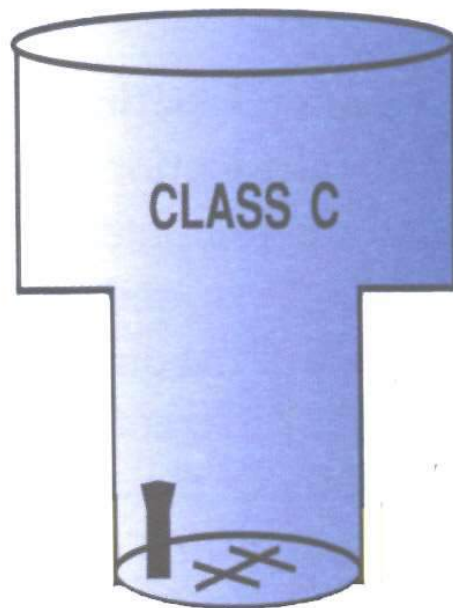
B

- **BIG**
- Big airspace
- Big airplanes
- Big airports
- **LAX**



Controlled Airspace

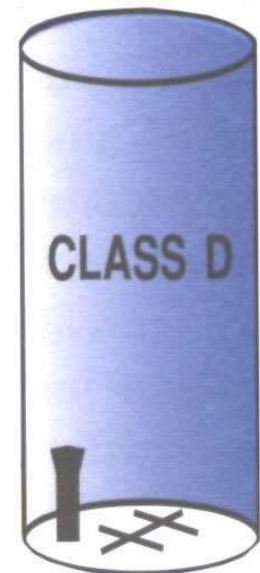
- Congested, radar assistance, talk to approach control
- BUR, SBA



Controlled Airspace

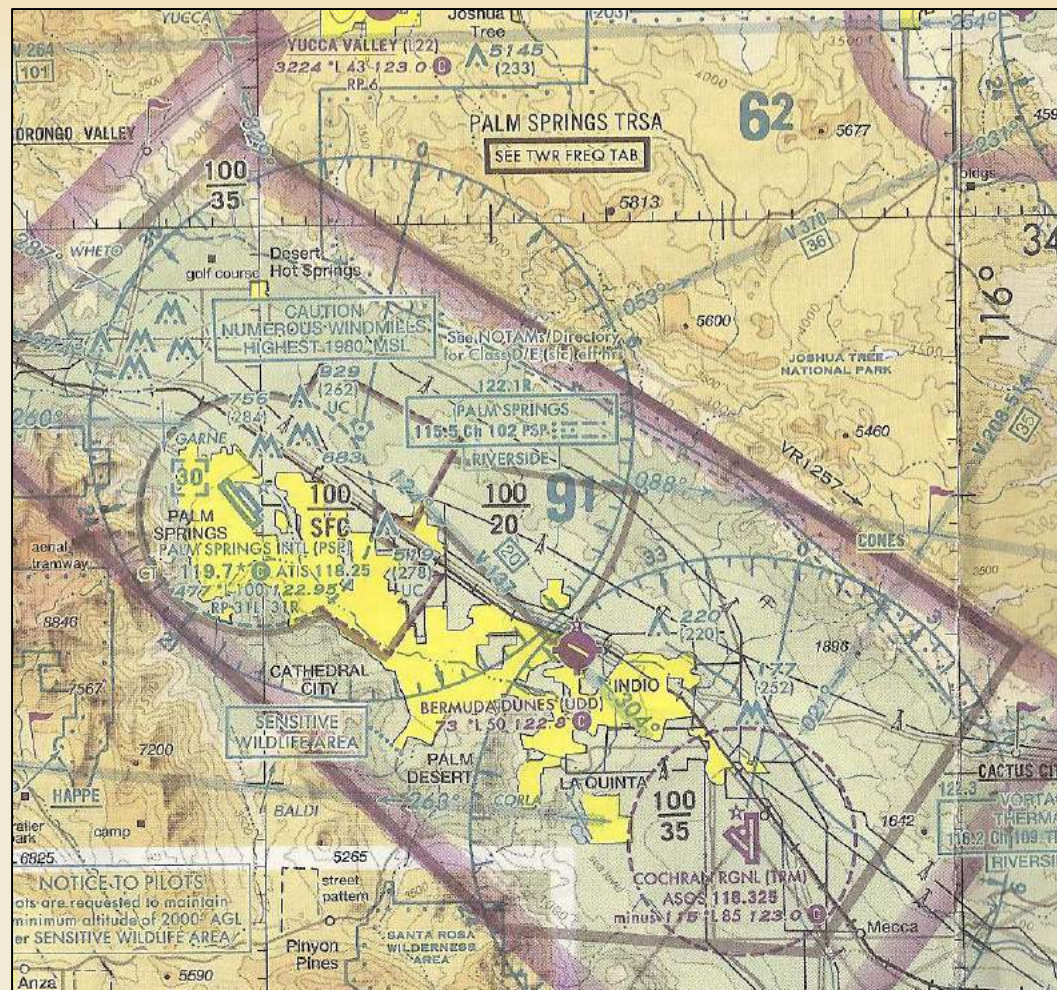
D

- Dialogue, not big or crowded but has a control tower.
- CMA, OXR, SMX, SBP



Aeronautical Charts

- Terminal Radar Service Areas (TRSA)



E

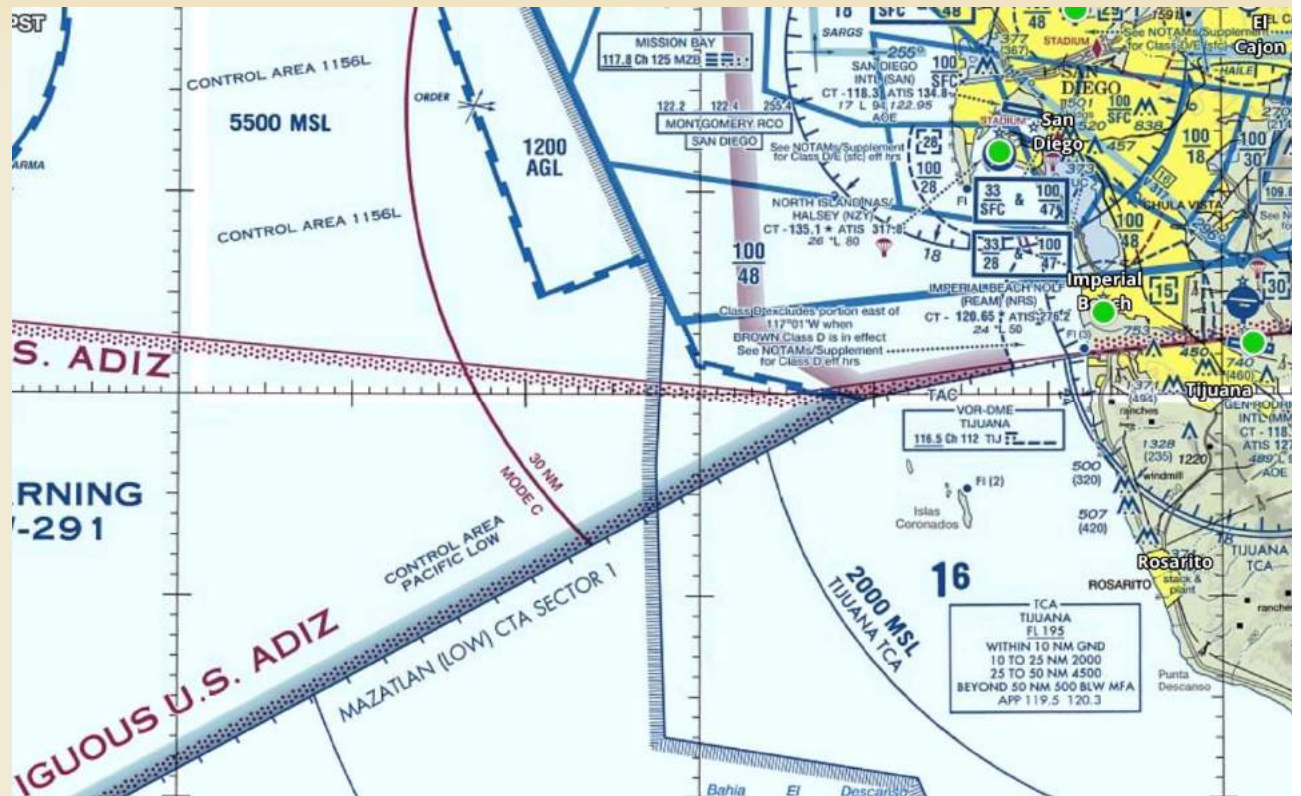
<https://doi.org/10.1016/j.sbsbs.2023.100001>

-

E

■ Everything Else

- Floor 1200' AGL or greater
- 18,000' top
- Abuts Class G airspace



Controlled Airspace

E

- Everything Else

- Floor 700' AGL
- 18,000' top
- IZA



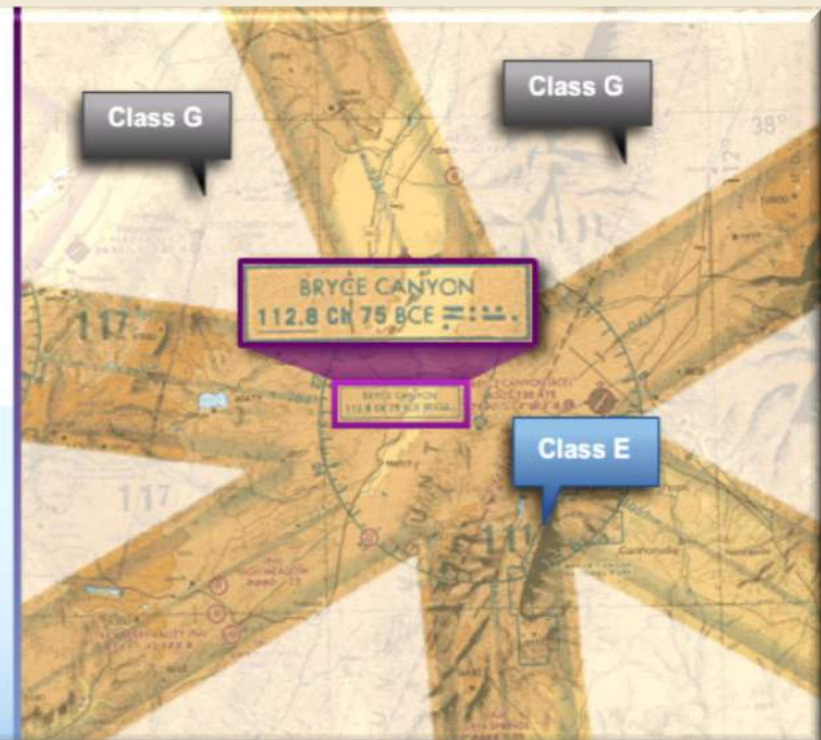
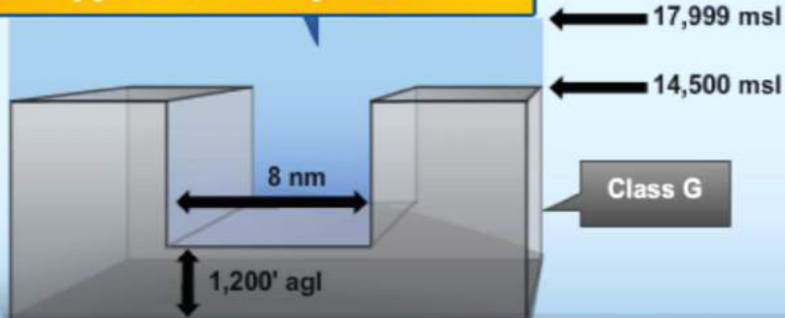
E

Controlled Airspace

Class E Federal Airways

More commonly known as Victor Airways, these “highways in the sky” connect VOR to VOR. They are protected by Class E airspace from 1,200 agl up to 17,999 msl, 4 nm from either side of the airway centerline.

Other Types of Airspace



Uncontrolled Airspace

- The Airspace in which ATC has no authority or responsibility to control air traffic, but remember there are VFR weather minimums which apply.
 - Surface to 14,500' MSL
 - SZP, LØ5



Cloud Clearance and Visibility Requirements

- Visual Flight Rules (VFR) or Instrument Flight Rules (IFR)
- IFR if less than 3 miles visibility and or 1,000' Ceiling in controlled airspace to the surface associated with an airport
- IFR Traffic Separation

Why?



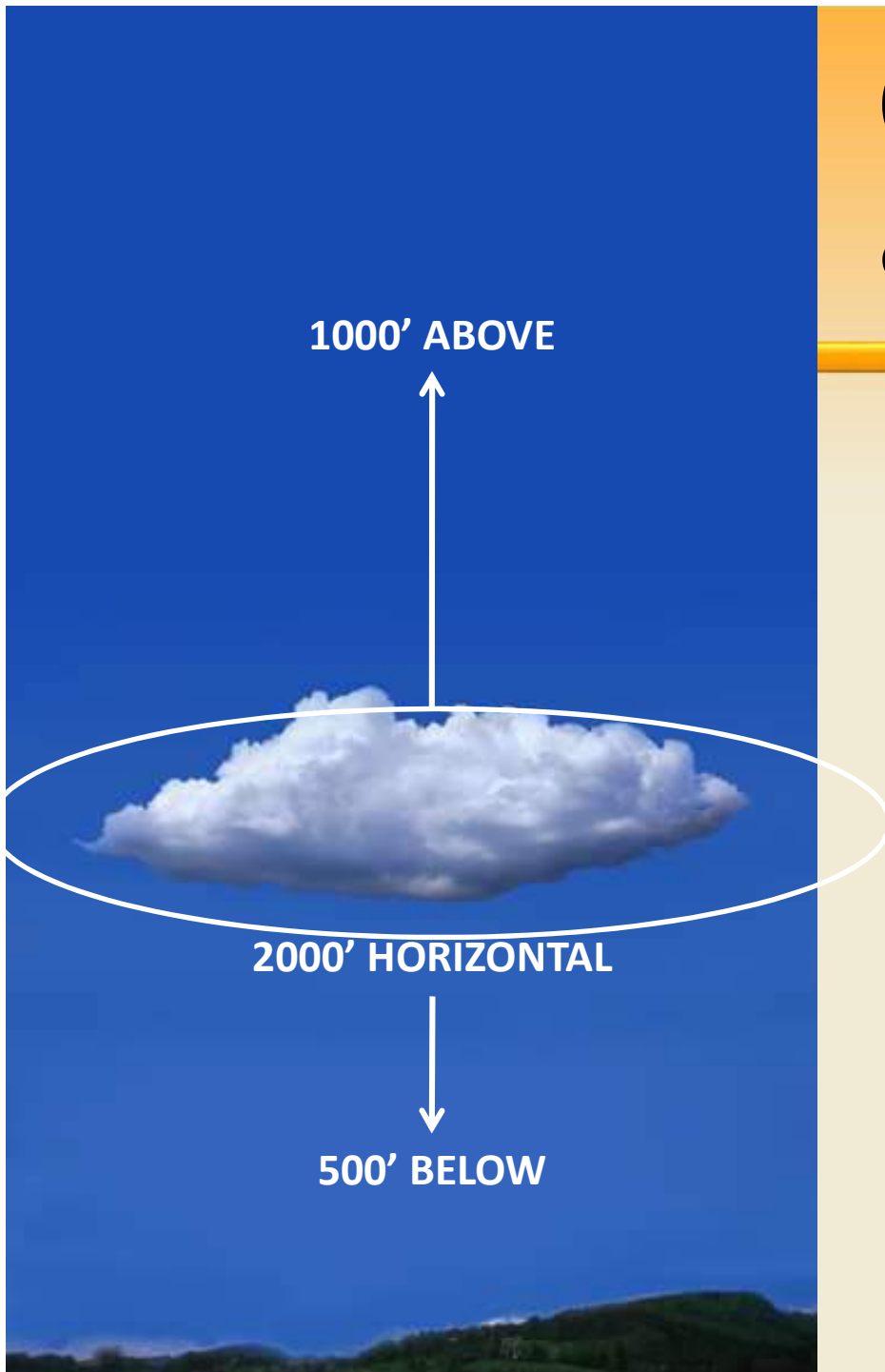


Cloud Clearance & Visibility

- **Class B**
 - 3 miles visibility
 - Clear of clouds

Cloud Clearance & Visibility

- **Class C, D & E**
 - 3 miles visibility
 - 1000' above
 - 500' below
 - 2000' horizontal



Cloud Clearance & Visibility

- **Class G - Day**
 - Below 1200' AGL
 - 1 mile visibility
 - Clear of clouds
 - Above 1200' AGL
 - 1 mile visibility
 - 1000' above
 - 500' below
 - 2000' horizontal
- **Class G - Night**
 - 3 miles visibility
 - 1000' above
 - 500' below
 - 2000' horizontal



EXCEPTION: Sport Pilots, or pilots operating under Sport Pilot Rules, Cannot Fly at Night OR with Visibility < 3 miles and ALWAYS Within Sight of the Ground.



Cloud Clearance & Visibility

- 10,000' MSL and above
 - 5 miles visibility
 - 1000' above
 - 1000' below
 - 1 mile horizontal

EXCEPTION: Sport Pilots, or pilots operating under Sport Pilot Rules, May Not Fly Over 10,000 ft or 2000 ft AGL if terrain is above 10,000 feet

Speed Limits

- **Above 10,000'**
 - No speed limit
- **Below 10,000'**
 - 250 knots
 - Under Class B, 200 knots
 - In Class C or D, 200 knots



Equipment



- **Transponder**
 - 10,000' and above
 - In or above Class C
 - 30NM Mode C
- **Radio**
 - Class B (clearance)
 - Class C and D (establish communications, must hear N-number)

Automatic Dependent Surveillance – Broadcast (ADS-B)

- Starting January 1, 2020, you must be equipped with ADS-B Out to fly in most controlled airspace.



Quiz: SZP

- Define airspace
 - Surface to 18,000'
- Cloud clearance?
- Requirements?
 - Transponder
 - Radio
- Speed limits?



18,000' MSL

**5 miles
visibility**



No speed restrictions

No radio

Yes transponder

10,000' MSL

**3 miles
visibility**



250 knots speed

No radio

No transponder

1200' AGL

1 mile visibility

Clear of clouds



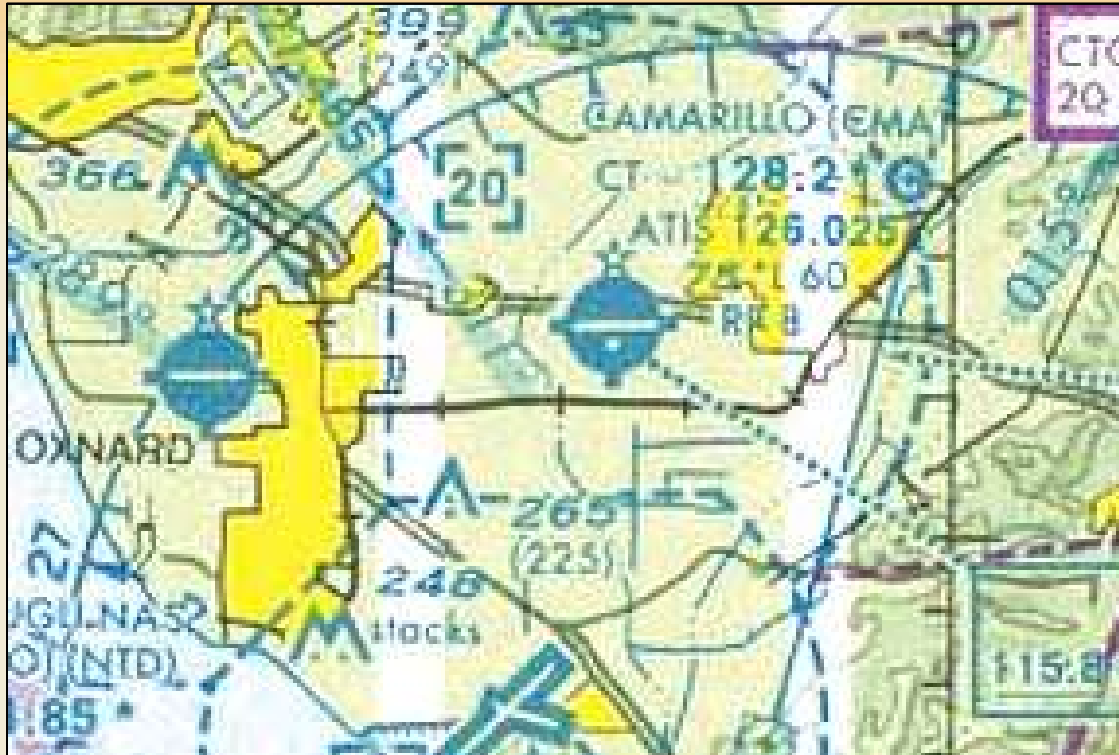
250 knots speed

No radio

No transponder



Quiz: CMA



Define airspace

- Surface to 18,000'

Cloud clearance?

Requirements?

- Transponder
- Radio

Speed limits?

A - IFR

18,000' MSL

5 miles
visibility

1 mile

1,000'

E

1,000'

No speed restrictions

No radio

Yes transponder

10,000' MSL

3 miles
visibility

2000'

1,000'

E

500'

250 knots speed

No radio

No transponder

2000' MSL

3 miles
visibility

2000'

1,000'

D

500'

200 knots speed

Yes radio

No transponder



Quiz: SBA



A - IFR

18,000' MSL

5 miles
visibility

1 mile

1,000'

E

1,000'

No speed restrictions

No radio

Yes transponder

10,000' MSL

3 miles
visibility

2000'

1,000'

E

500'

250 knots speed

No radio

Yes transponder

4000' MSL

3 miles
visibility

2000'

1,000'

C

500'

200 knots speed

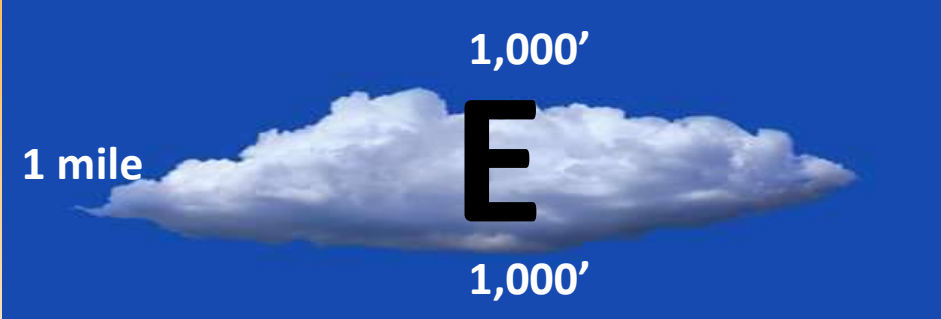


Yes radio

Yes transponder



Quiz: IZA



A - IFR		
18,000' MSL		No speed restrictions No radio Yes transponder
10,000' MSL		250 knots speed No radio No transponder
700' AGL		250 knots speed No radio No transponder

1 mile visibility

Clear of clouds



Quiz: PRB



A - IFR

18,000' MSL

5 miles
visibility

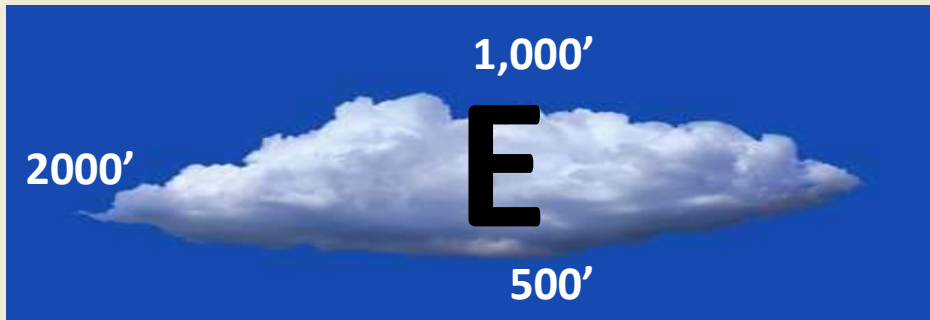


No speed restrictions

No radio
Yes transponder

10,000' MSL

3 miles
visibility

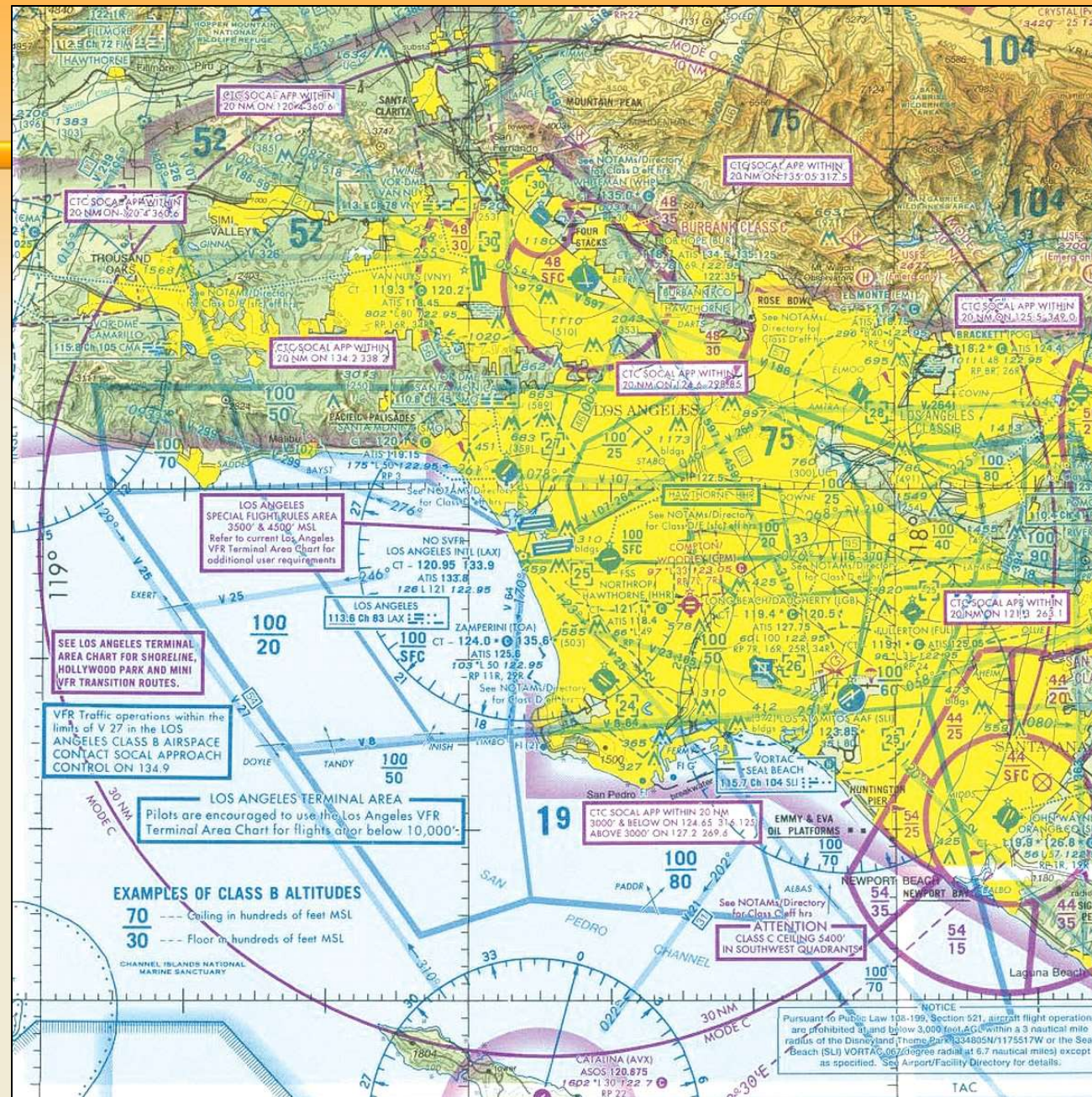


250 knots speed

No radio
No transponder



Quiz: LAX



A - IFR

18,000' MSL

5 miles
visibility

1 mile

1,000'

E

1,000'

No speed restrictions

No radio

Yes transponder

10,000' MSL

3 miles
visibility
Clear of
Clouds

B

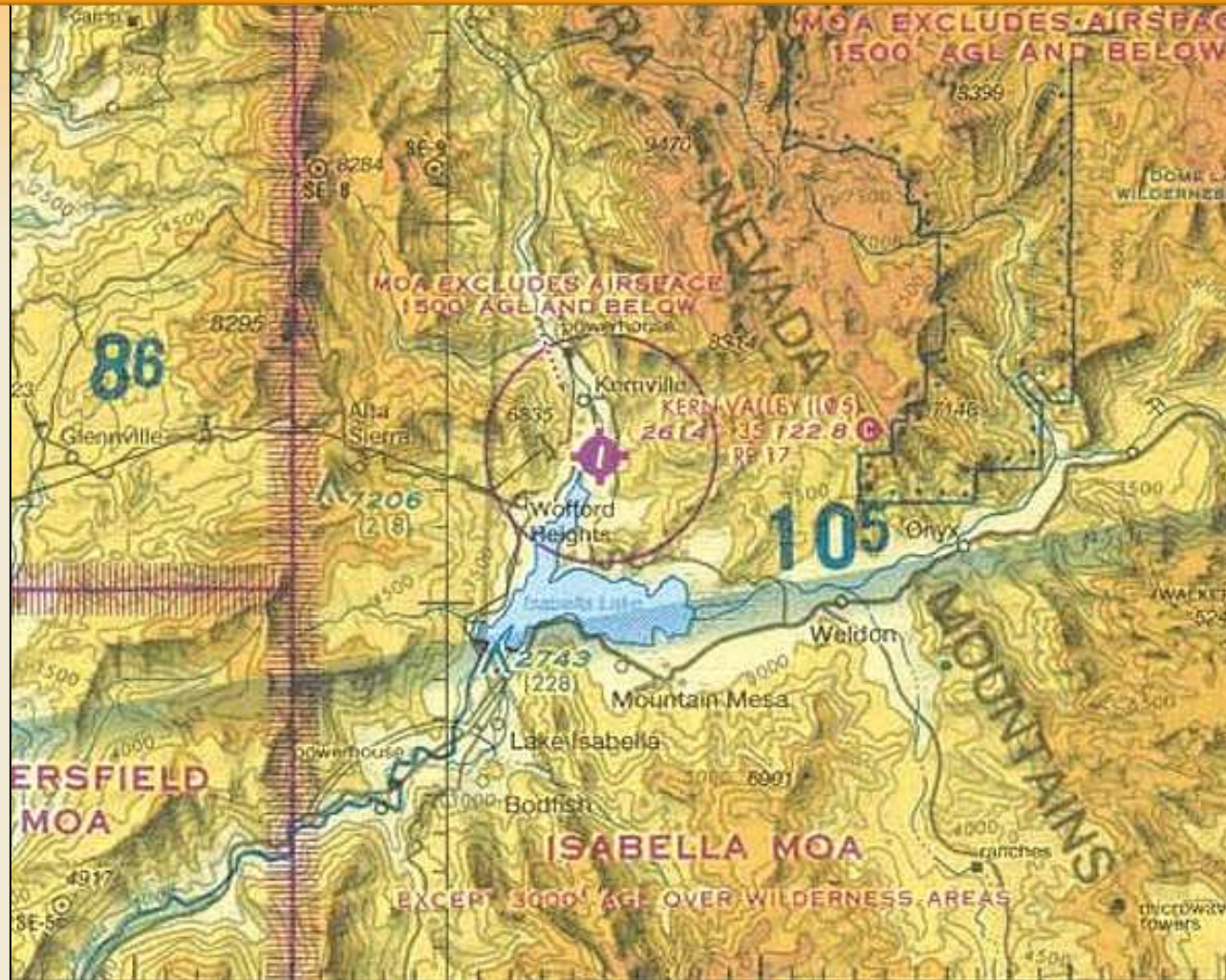
250 knots speed

Yes radio

Yes transponder



Quiz: LØ5



A - IFR

18,000' MSL

5 miles
visibility

1 mile

1,000'

E

1,000'

No speed restrictions

No radio

Yes transponder

14,500' MSL

5 miles
visibility

1 mile

1,000'

G

1000'

No speed restrictions

No radio

Yes transponder

10,000' MSL

1 mile
visibility

2000'

1,000'

G

500'

250 knots speed

No radio

No transponder

1200' AGL

1 mile visibility

Clear of clouds

G

250 knots speed

No radio

No transponder



Regardless if you are in controlled or uncontrolled airspace it is the responsibility of the pilot-in-command to see and avoid other aircraft.



Emergency Maneuver Training Scholarship



In Memory of Vicki Cruse
www.cpaviation.com