

Private

AVP 105 - Ground Lesson (GL) 4

Chapter 4 – The Flight Environment

GL 4 Objectives

- Safe and efficient operation of aircraft, including collision avoidance
 - Explain collision avoidance procedures, including visual scanning techniques and runway incursion avoidance
 - Recall right of way rules and minimum safe altitudes
- Applicable subjects of AIM
 - Interpret Airport markings, signs and lighting
 - Identify airspace types and operating requirements
- Charts
 - Interpret Chart Symbolology
 - Interpret communication and navigation information on charts

Collision Avoidance Procedures

- Runway Incursion Avoidance
 - Eyes and Ears
- Look outside, all the time, as much as possible
- Scan – see and avoid – move that narrow cone of good vision around
 - Short, regularly spaced eye movements
- Pulse Light on so other pilots can see you
- Talk when coming into or exiting the pattern and in the practice area
- Use ATC VFR flight following when going cross-country (later this quarter)
- Clear the area when practicing maneuvers

Right-of-Way Rules – 91.113

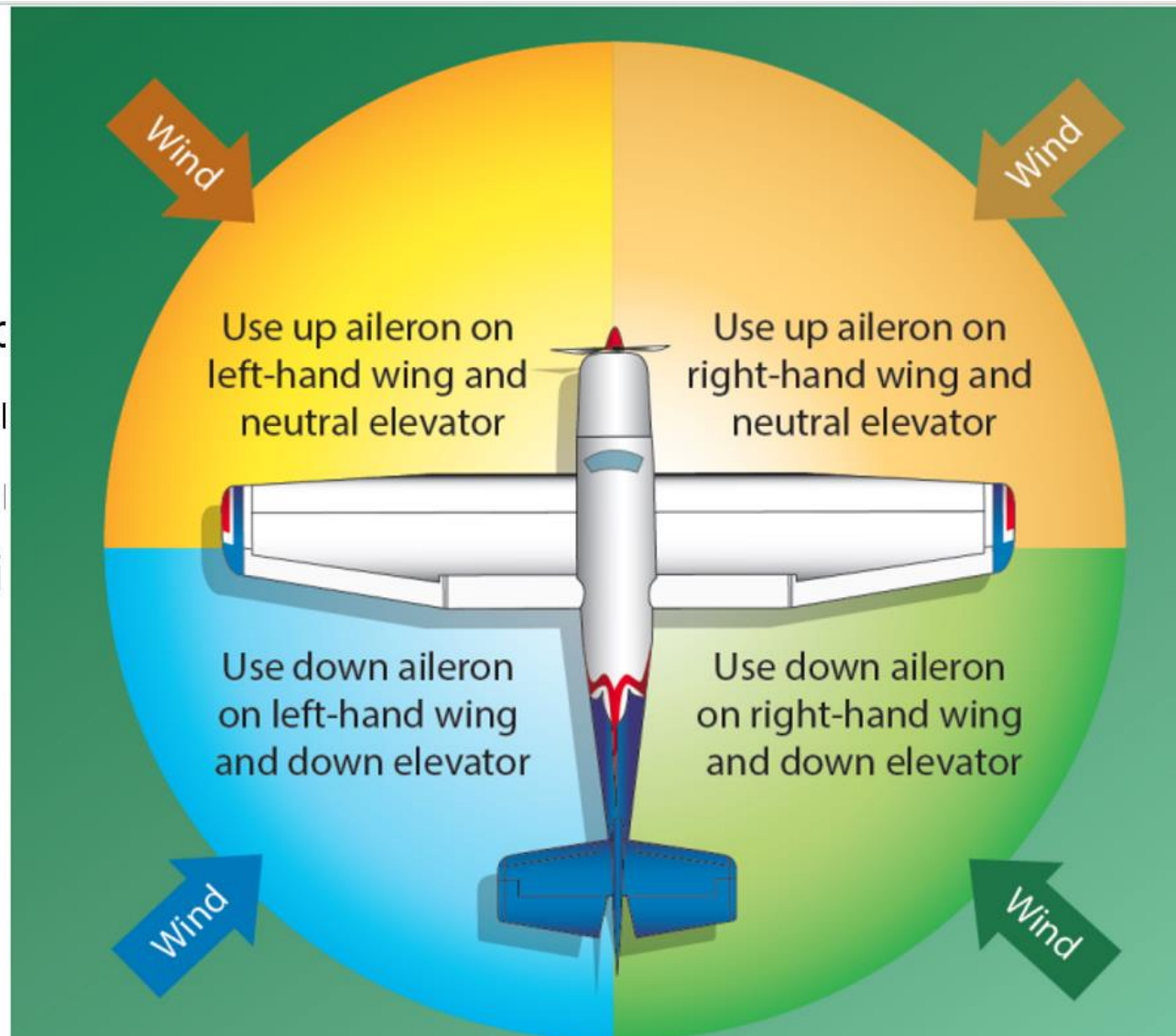
- Aircraft in distress
- Aircraft being overtaken
- Same category converging (not headon) aircraft to the right
- Headon – Both aircraft give way to the right
- Least maneuverable normally has the right of way
 - Balloon over glider over airplane over rotorcraft
- Approaching for landing, aircraft at the lower altitude

Minimum Safe Altitudes – 91.119

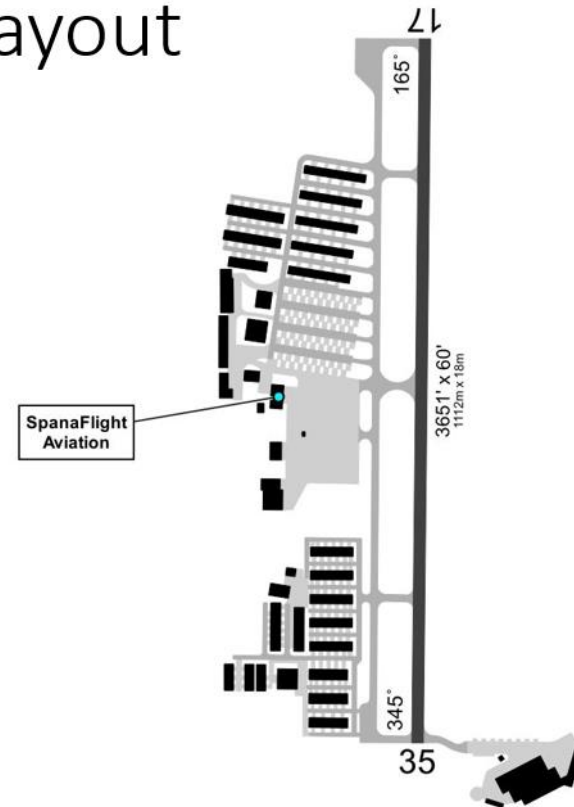
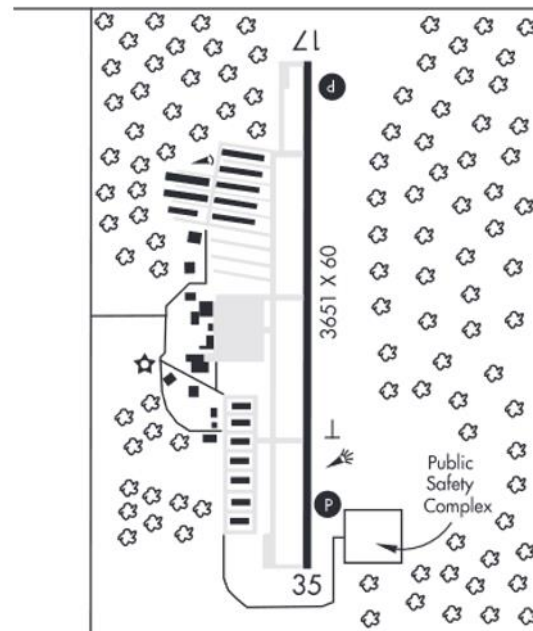
- Except when necessary for takeoff and landing, no person may operate an aircraft below the following altitude
- Anywhere – an altitude allowing for an engine failure without undue hazard to persons or property on the surface
- Congested – 1,000 ft above the highest obstacle in a 2,000 ft radius of the aircraft
- Other than Congested
 - Uncongested – 500 ft above the surface, except....
 - Sparse – No closer than 500 ft of any person, vessel, vehicle or structure

Taxiing

- Appropriate Speed
- No checklists, 1
- Looking out for
- Controls position



KPLU - Taxiing and Runway Layout



Traffic Pattern

- See Handout

Cessna 172N Airspeeds and VFR Traffic Pattern

- Traffic Pattern Altitude (TPA) 1000' AGL unless established otherwise
- Turns not to exceed 30° of bank

V - Speeds	KIAS	
	Model minius >	94F
<u>V_{ne}</u>	160	158
<u>V_{no}</u>	128	127
<u>V_a</u>	80-97	
<u>V_{fe}</u>	85	
Enroute Climb	70-85	
<u>V_x</u>	73	
<u>V_y</u>	59	
<u>V_{s1}</u>	47	44
<u>V_{s0}</u>	41	33
<u>V_r</u>	55	
Max XW	15	
Best Glide	65	

Power 1900-2100 RPM
80 KIAS
Radio Call
Checklist
Trim

45° Entry
TPA
80 KIAS
Radio Call

ABEAM TOUCHDOWN
Power 1400-1600 RPM
Carb Heat - On
Flaps - 10°
Begin Descent
80 KIAS

At 45° Point - 30° bank
turn to base

Flaps as required
70 KIAS
"Base" Radio Call

Departing Pattern
Straight out or 45° turn at
TPA, beyond departure end
of runway

Staying in Pattern
First turn within 300'
below TPA and past
departure end of runway

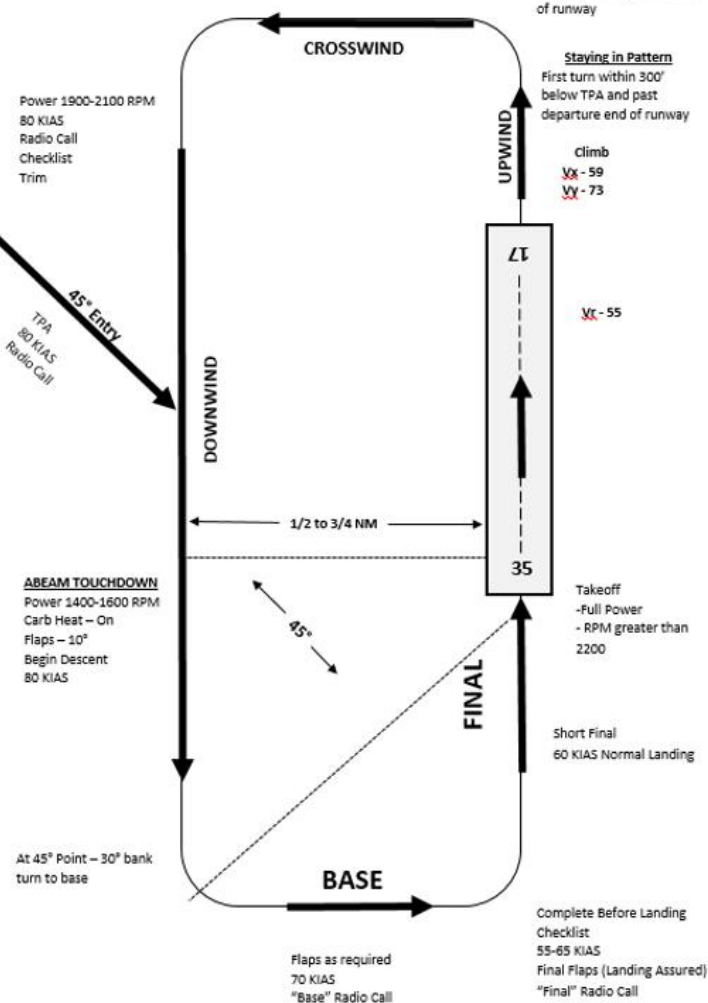
Climb
V_x - 59
V_y - 73

V_r - 55

Takeoff
- Pull Power
- RPM greater than
2200

Short Final
60 KIAS Normal Landing

Complete Before Landing
Checklist
55-65 KIAS
Final Flaps (Landing Assured)
"Final" Radio Call



Cessna 172N Airspeeds and VFR Traffic Pattern

- Traffic Pattern Altitude (TPA) 1000' AGL unless established otherwise
- Turns not to exceed 30° of bank

	KIAS	
V - Speeds	ⁿ Model, minius →	94F
<u>V_{ne}</u>	160	158
<u>V_{no}</u>	128	127
<u>V_a</u>	80-97	
<u>V_{fe}</u>	85	
Enroute Climb	70-85	
<u>V_x</u>	73	
<u>V_y</u>	59	
V _{s1}	47	44
V _{s0}	41	33
V _r	55	
Max XW	15	
Best Glide	65	

- Power 1900-2100 RPM
- 80 KIAS
- Radio Call
- Checklist
- Trim

TPA
80 KIAS
Radio Call

ABEAM TOUCHDOWN
Power 1400-1600 RPM
Carb Heat – On
Flaps – 10°
Begin Descent
80 KIAS

At 45° Point – 30° bank
turn to base

Flaps as required
70 KIAS
"Base" Radio Call

Departing Pattern
Straight out or 45° turn at
TPA, beyond departure end
of runway

Staying in Pattern
First turn within 300'
below TPA and past
departure end of runway

Climb
Vx - 59
Vy - 73

Vr - 55

Takeoff
-Full Power
- RPM greater than
2200

Short Final
60 KIAS Normal Landing

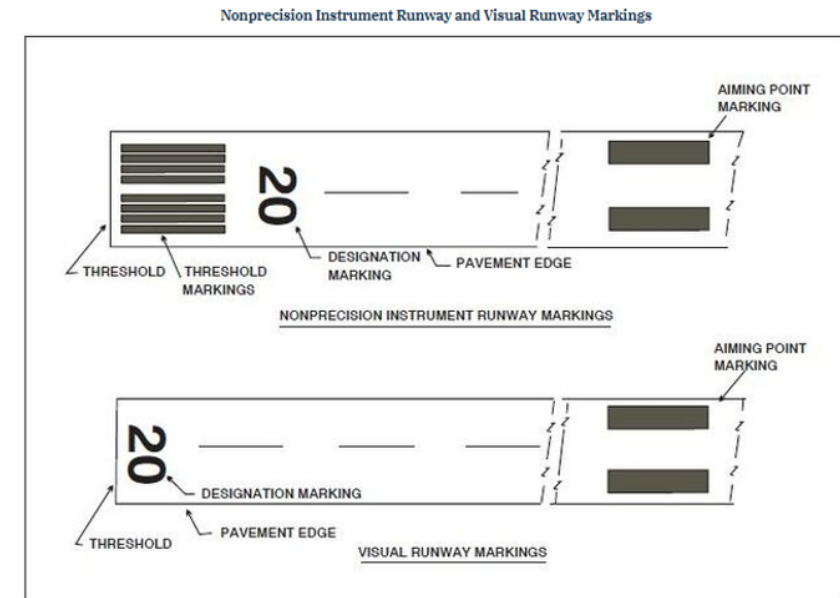
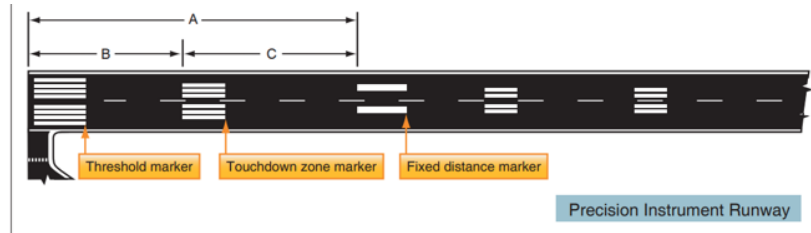
Complete Before Landing Checklist
55-65 KIAS
Final Flaps (Landing Assured)
"Final" Radio Call

Runway Markings

- Three types of runway markings:
- Precision Instrument
- Nonprecision Instrument
- Visual

Number of Runway Threshold Stripes

Runway Width	Number of Stripes
60 feet (18 m)	4
75 feet (23 m)	6
100 feet (30 m)	8
150 feet (45 m)	12
200 feet (60 m)	16





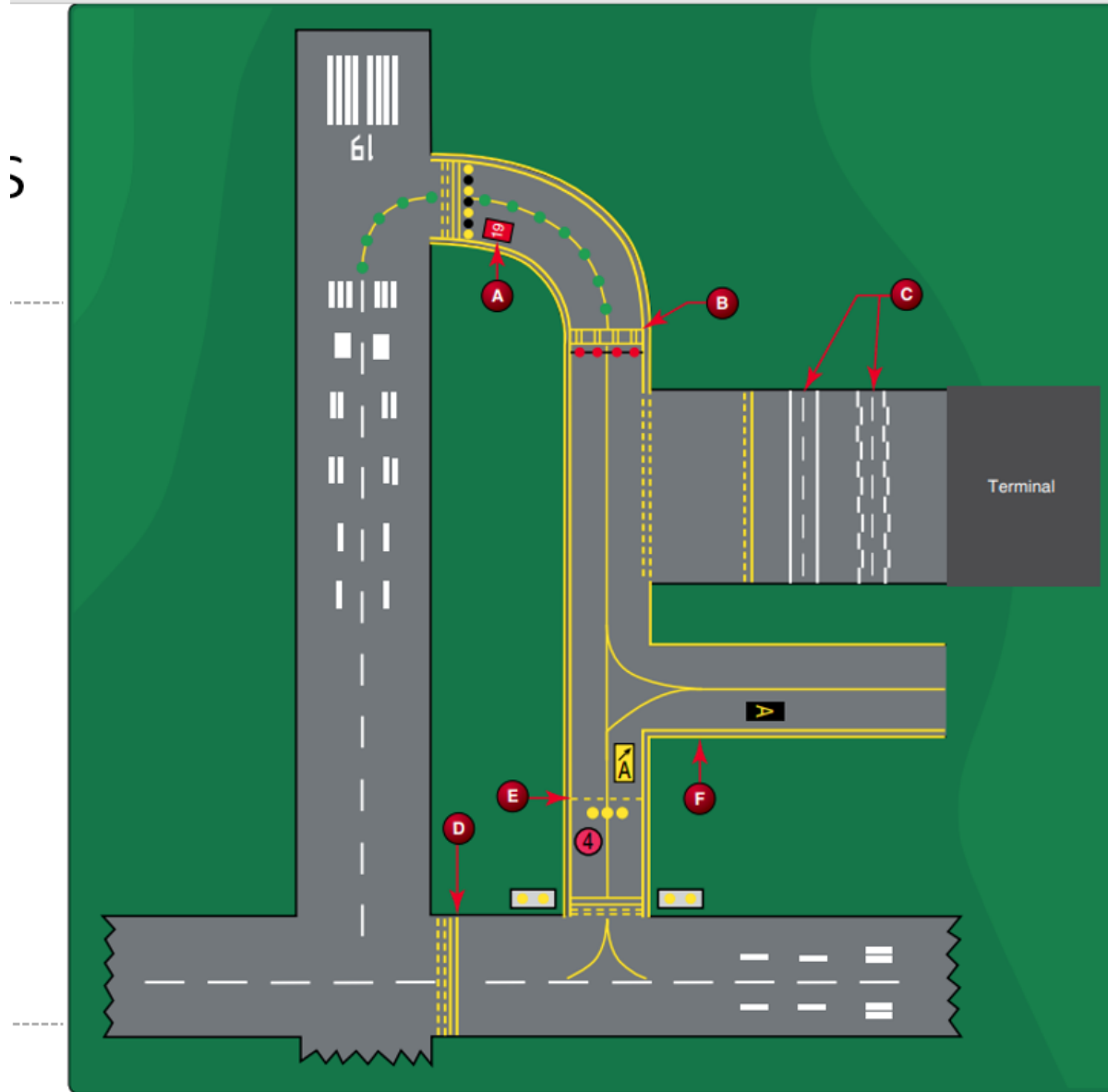
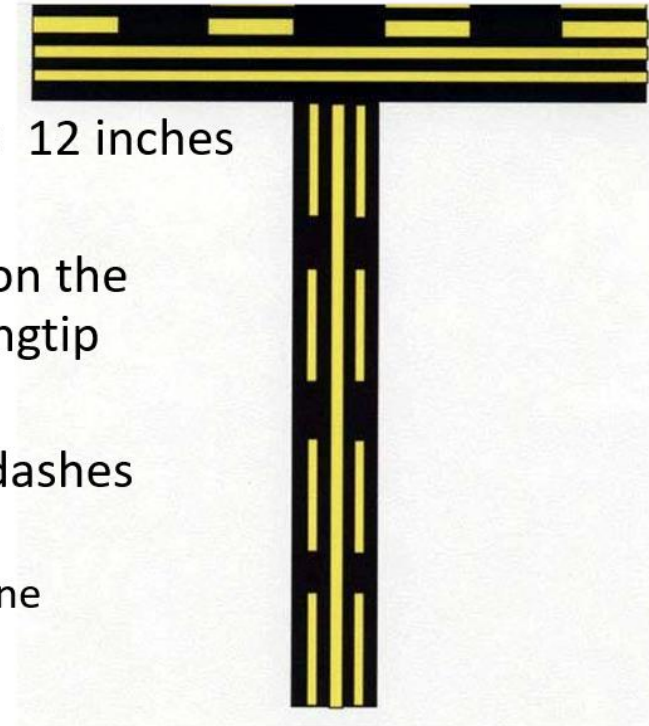


Figure 64. Airport Markings.

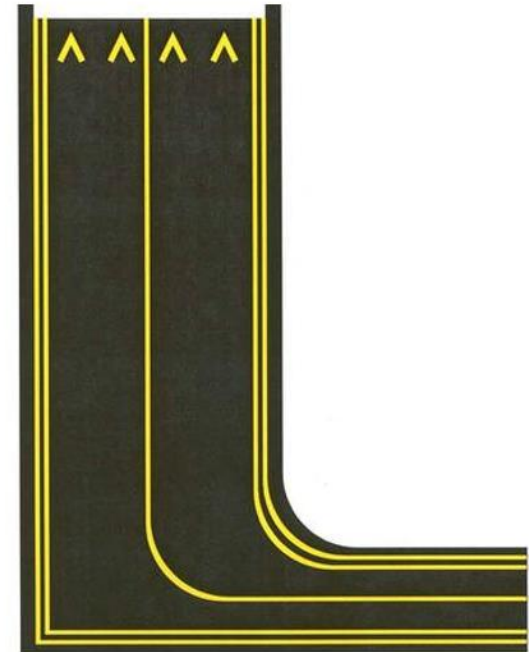
Taxiway Markings

- Normally a single continuous yellow line, 6 to 12 inches wide
- Provides visual cue for staying on the center on the taxiway, although this does not guarantee wingtip clearance from other aircraft or objects
- Enhanced Centerline - Parallel line of yellow dashes along the normal yellow centerline
 - Used for a maximum of 150 feet prior to a hold line



Taxiway Edge Markings

- Continuous – Used to define the taxiway edge from the shoulder or some other abutting paved surface not intended for use by aircraft
- Dashed Markings – Used when there is an operational need to define the edge of the taxiway, like on an apron.



Taxiway Shoulder Markings

- Taxiways, holding bays, and aprons are sometimes provided with paved shoulders to prevent blast and water erosion.
- Where conditions exist such as islands or taxiway curves that may cause confusion as to which side of the edge stripe is for use by aircraft, taxiway shoulder markings may be used to indicate the pavement is unusable.





Federal Aviation
Administration

Do You Know Your Airport Signs, Markings & Lights?

Write the correct letter in each blank matching the description. Answers are at the bottom.



A



B



C



D



E



F



G

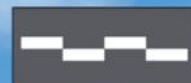


H



J

1. ____ This sign identifies the runway upon which your aircraft is currently located.
2. ____ This sign indicates thousands of feet remaining to the end of the runway.
3. ____ This marking means the runway or taxiway is closed.
4. ____ These lights outline the edges of a runway.
5. ____ This array is located at the intersection of two runways and a taxiway.
6. ____ When seen on a taxiway in conjunction with a red and white runway identifier sign, this surface-painted marking indicates that an aircraft or vehicle may taxi up to but not cross the double solid lines until instructed to proceed by ATC.
7. ____ An aircraft that taxis past this sign may interfere with the navigational landing aid signals that an approaching aircraft is using. Stop if directed to by ATC.
8. ____ Stopping behind this marking will ensure wingtip clearance for aircraft on an intersecting taxiway.
9. ____ This painted marking indicates the edge of the ILS critical area. Ground control may ask you to hold short of this marking if an aircraft is using the ILS.
10. ____ This sign alerts of an approaching runway and is accompanied by a yellow, surface-painted runway holding position marking.
11. ____ This no entry sign denotes that aircraft are prohibited from proceeding beyond it.
12. ____ Taxiing past this sign may interfere with operations on the runway. Stop if directed to by ATC.
13. ____ These lights outline the edges of a taxiway.
14. ____ These lights are sometimes installed on each side of a taxiway prior to its intersection with a runway.
15. ____ This sign identifies the taxiway upon which you are located.
16. ____ This marking indicates the edge of a path for vehicle traffic on areas also intended for aircraft.
17. ____ This array indicates that you are approaching the intersection of two taxiways.
18. ____ This sign indicates the direction to a destination runway.
19. ____ This sign indicates an exit from a runway onto the designated taxiway.
20. ____ This surface-painted marking separates the movement and non-movement areas on the airport. ATC clearance is needed to move beyond the solid line onto the movement area.
21. ____ This surface-painted enhanced taxiway centerline marking runs up to 150 feet back from the holding position marking and alerts of an approaching runway.



K



L



M



N



P



Q



R



S



T



U



V



W

www.faa.gov/go/runwaysafety



AKTS Figure 65

- https://www.faa.gov/airports/runway_safety/resources/flashcards/

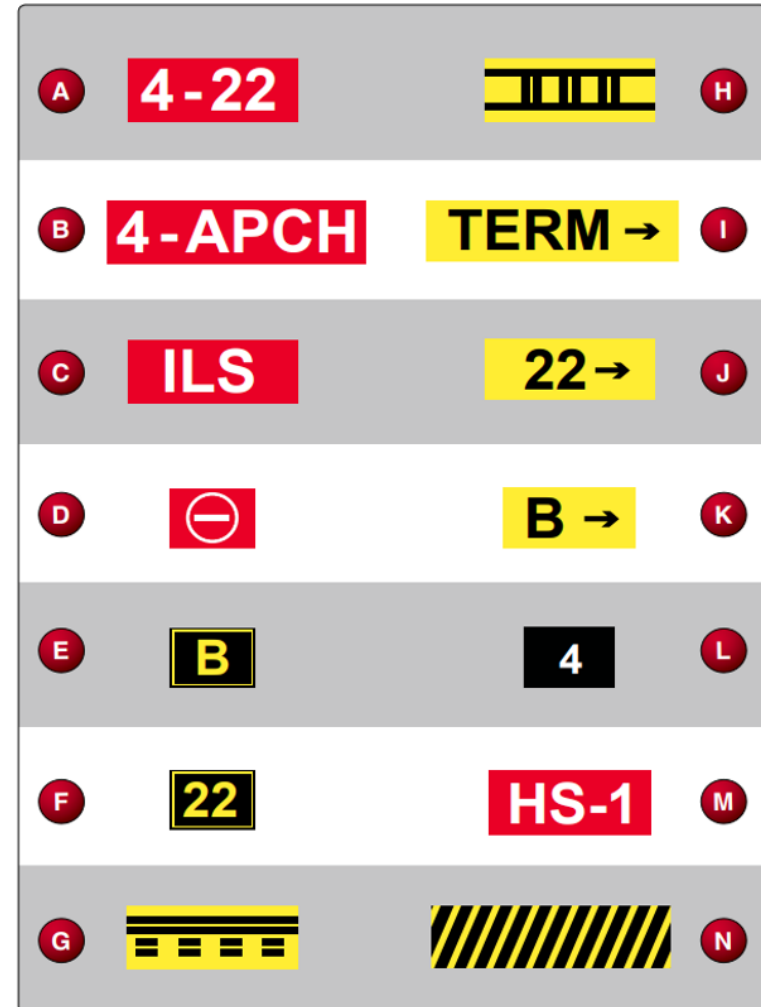


Figure 51. Airport Signs.

VASI Systems

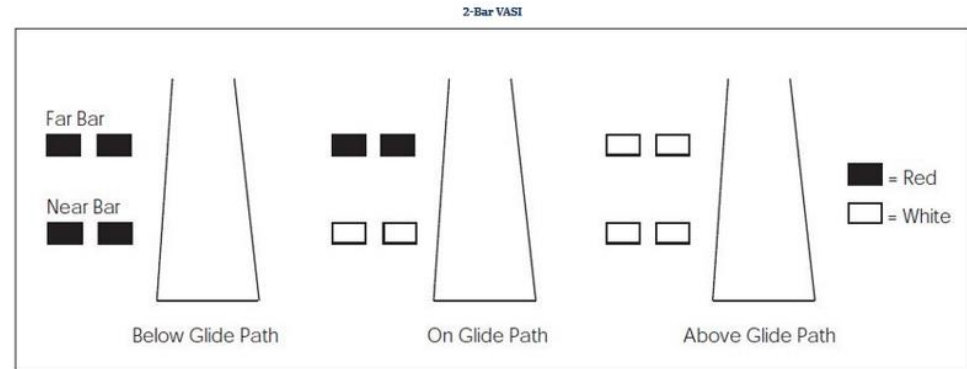
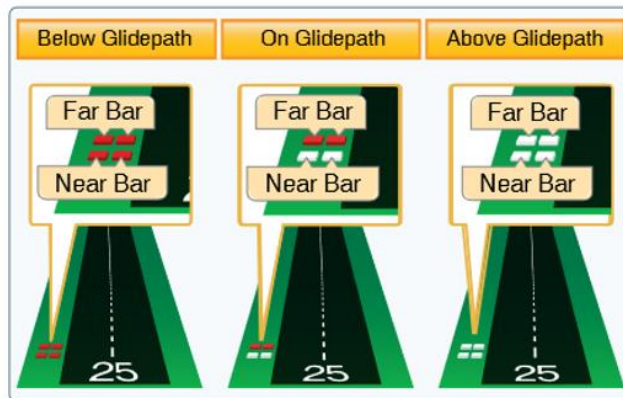
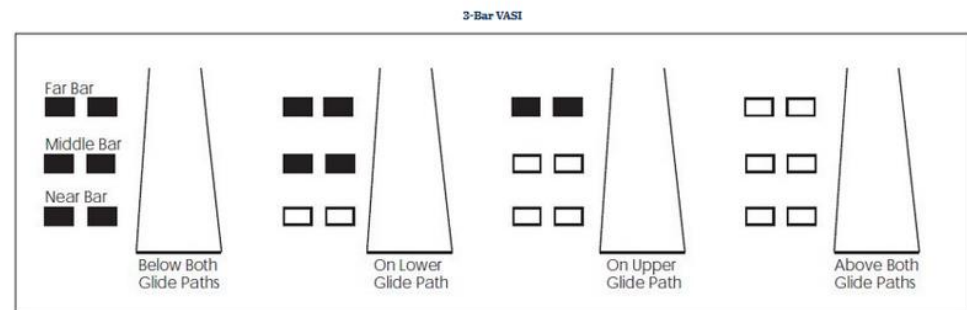
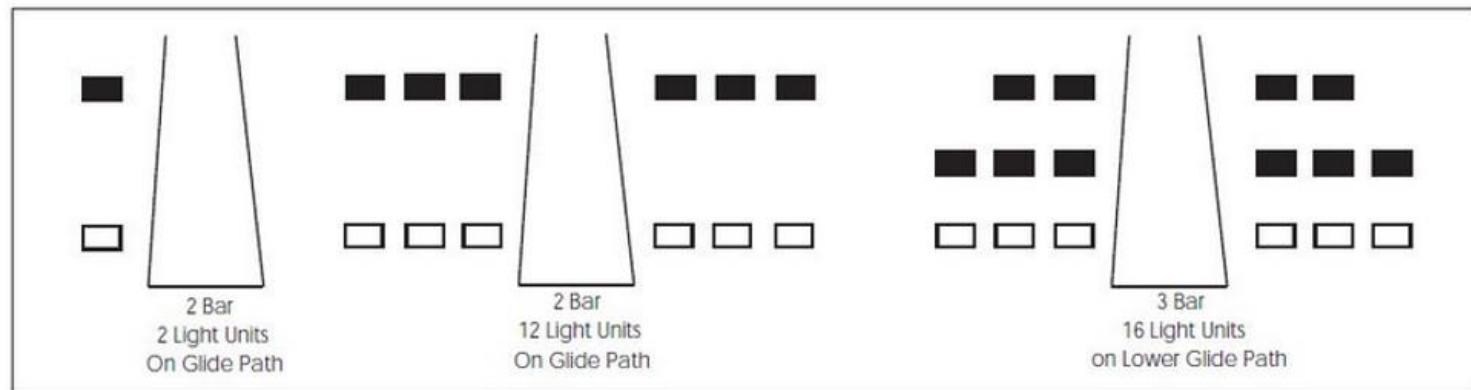


FIG 2-1-3



VASI Systems



PAPI

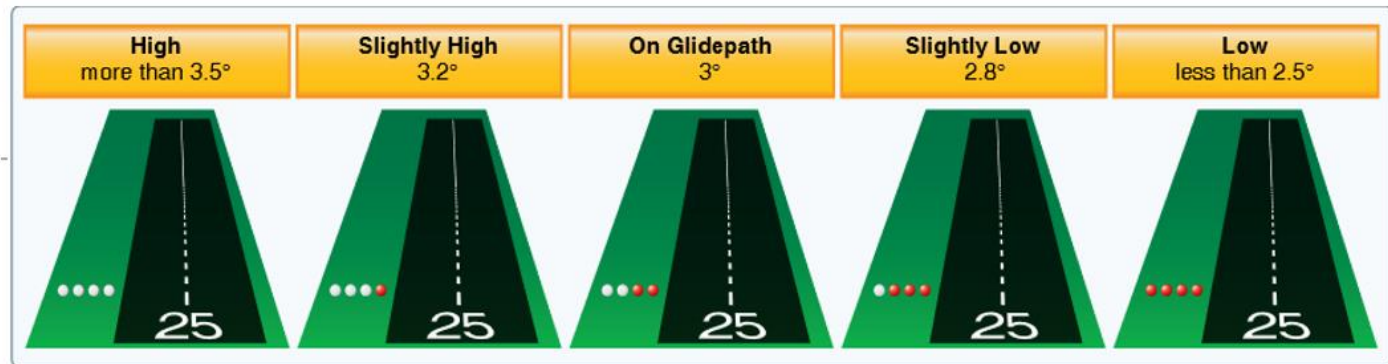


Figure 14-30. Precision approach path indicator for a typical 3° glide slope.

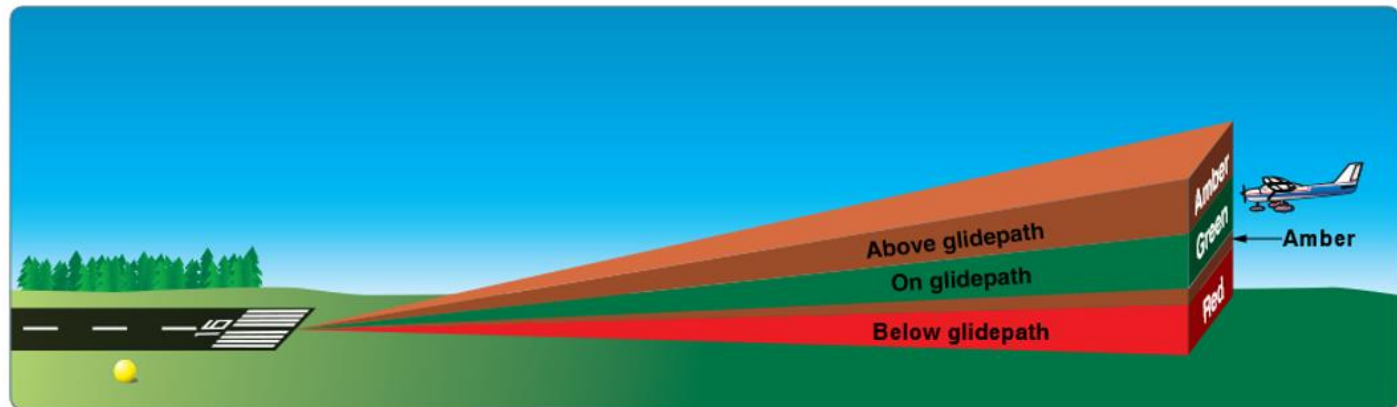
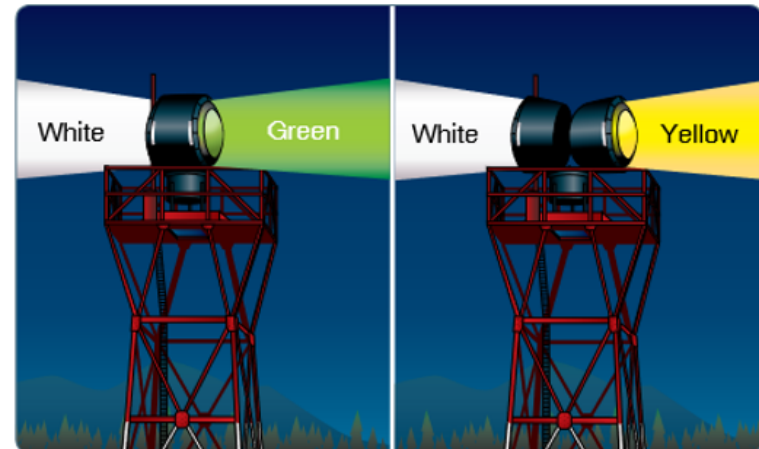


Figure 14-31. Tri-color visual approach slope indicator.

Airport Beacons

- Flashing white and green for civilian land airports
- Flashing white and yellow for a water airport
- Flashing white, yellow, and green for a heliport
- Two quick white flashes alternating with a green flash identifying a military airport



VFR Charts

- Sectional vs TAC vs Flyway
- Chart Symbolology basics
- Airspace Symbolology basics
- Get to know the Chart Users Guide -
https://aeronav.faa.gov/user_guide/20230223/cug-complete.pdf
- If it's on the chart you are using, you should know what it means



ent

be put on the Sectional

https://www.faa.gov/air_traffic/flight_info/aeronav/Digital_Products/Chart_Supplement_Northwest

Consult NOTAMs for latest information
Consult/Subscribe to FAA Safety Alerts and Charting Notices at:
https://www.faa.gov/air_traffic/flight_info/aeronav/safety_alerts/
Warning: Refer to current foreign charts and flight information publications
for information within foreign airspace
Published from digital files compiled in accordance with Interagency Air
Committee specifications and agreements approved by: Department of
Defense • Federal Aviation Administration



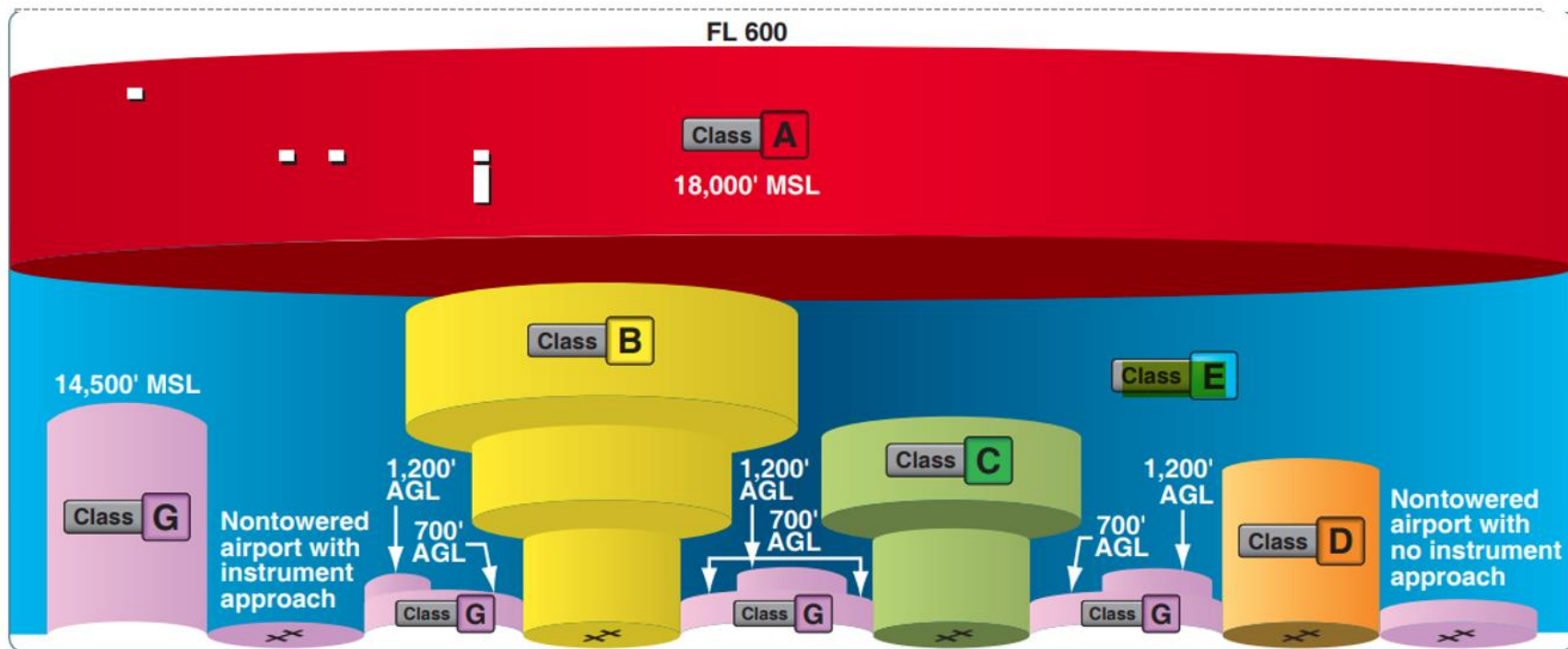


Figure 15-1. *Airspace profile.*

Basic VFR Weather Minimums					
Airspace			Flight Visibility	Distance from Clouds	
Class	A				
Class	B				
Class	C				
Class	D				
Class	E	At or above 10,000 feet MSL	5 statute miles	1,000 feet above 1,000 feet below 1 statute mile horizontal	
		Less than 10,000 feet MSL	3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal	
Class	G	1,200 feet or less above the surface (regardless of MSL altitude).	Day, except as provided in section 91.155(b)	1 statute mile	Clear of clouds
			Night, except as provided in section 91.155(b)	3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
	More than 1,200 feet above the surface but less than 10,000 feet MSL.	Day	1 statute mile	1,000 feet above 500 feet below 2,000 feet horizontal	
		Night	3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal	
	More than 1,200 feet above the surface and at or above 10,000 feet MSL.		5 statute miles	1,000 feet above 1,000 feet below 1 statute mile horizontal	

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.			

Controlled Airspace

- Class E – most of your flying
 - No requirement to talk to ATC, but VFR flight following is available
 - Can start at the surface, 700 ft AGL or 1,200 ft AGL
- Class D – Generally Part Time towers
 - Typically 4 NM radius, surface to 2,500 ft AGL
 - Other shapes and altitudes
 - Requires two-way radio communication

Controlled Airspace

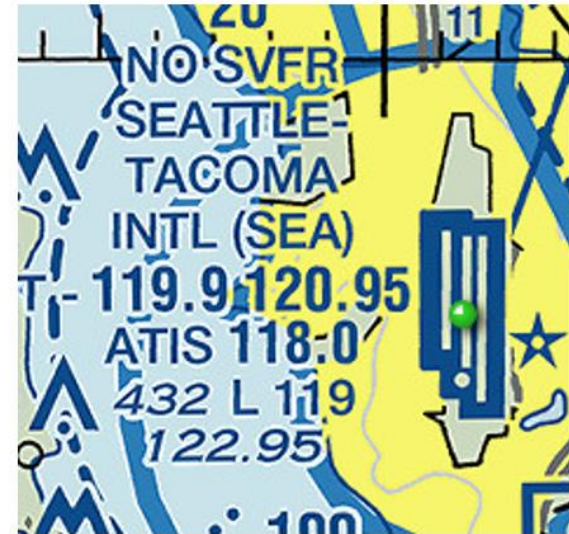
- Class C – Generally full time towers
 - Typically 5 NM inner core, surface to 4,000 ft AGL
 - Outer Core to 10 NM, 1,200 ft AGL to 4,000 ft AGL
 - Requires two-way radio contact to enter, along with equipment requirements
- Class B – Busy – Busiest airports
 - No “normal” shape
 - Requires ATC Clearance to enter
 - Student pilots require an endorsement for that specific area
 - Don’t expect to enter our Class B
- Class A – 18,000 ft MSL to FL 600 – IFR clearances only

Know Airspace Basic VFR minimums and equipment requirements

- Review page 4-91 in the textbook
- You need to know this page. It's not information you can look up while you are flying
- Basic VFR weather minimums are detailed in 91.155

Special VFR – 91.157

- Allows some operations below Basic VFR minimums
- Allowed in Class B, C, D and surface designated Class E
- Must have at least 1 SM of flight visibility and stay clear of clouds
- Night – pilot must be instrument rated and plane must be instrument equipped
- Some airports don't allow SVFR



Special Use Airspace – See AIM Section 3-4

- Special use airspace (SUA) consists of that airspace wherein activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of those activities, or both
 - Prohibited Area – flight is prohibited
 - Restricted Area – invisible hazards – Released to FAA when not active
 - Warning Area – activity hazardous to nonparticipating aircraft, similar to Restricted area except outward from 3 NM from coast. Includes international waters
 - MOA – Military Operating Area
 - Alert Areas – High volume of pilot training or unusual activity
 - Controlled Firing Area - activity hazardous to nonparticipating aircraft, activities suspended when aircraft might approach area – not on the chart
 - National Security Area – increased security

Temporary Flight Restrictions (TFRs)

- To protect persons or property from an imminent hazard
- Safe environment for disaster relief aircraft
- Protect POTUS, VPOTUS, or other public figures
- Provide safe environment for space agency operations
- <https://tfr.faa.gov/tfr2/list.html>

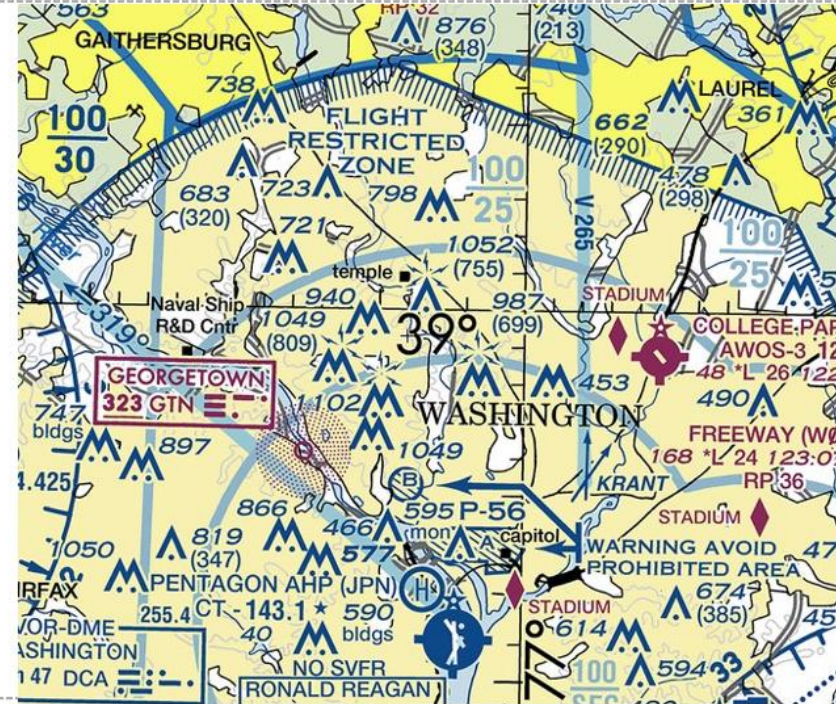
NOTAM Text: !FDC 2/0296 ZSE WA..AIRSPACE 40NM W OF YAKAMA, WA..TEMPORARY FLIGHT RESTRICTIONS WI AN AREA DEFINED AS 464100N1214130W (SEA132051.8) TO 464100N1212400W (SEA121058.6) TO 463345N1212400W (SEA126064.3) TO 463345N1214130W (ELLENSBURG VOR/DME ELN220057.9) TO POINT OF ORIGIN SFC-9000FT. TO PROVIDE A SAFE ENVIRONMENT FOR FIRE FIGHTING ACFT OPS.. PURSUANT TO 14 CFR SECTION 91.137(A)(2) TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT. GIFFORD PINCHOT NATIONAL FOREST TEL 360-891-5140 OR FREQ 133.1750/GOAT ROCKS FIRE IS IN CHARGE OF THE OPS. SEATTLE /ZSE/ ARTCC TEL 253-351-3698 IS THE FAA CDN FACILITY. EFFECTIVE: DLY 1600-0200 2210091600 UTC UNTIL 2210310200 UTC 2210091600-2210310200EST

Military Training Routes (MTRs)

- IR – Instrument Routes - ATC control
- VR – Visual Routes
- MTRs with no segment above 1,500 feet AGL are identified by four number characters (e.g., IR1206, VR1207) – all below 1,500 ft AGL
- MTRs that include one or more segments above 1,500 feet AGL are identified by three number characters (e.g., IR206, VR207)



Special Flight Rules Area (SFRA) Flight Restricted Zone (FRZ)



Completion Standards

- Demonstrate understanding of collision avoidance, right of way rules, minimum safe altitudes, airport markings and lighting, runway incursion avoidance, LAHSO, charts, and airspace requirements
- Complete the quizzes

Any Questions?

- Next – AVP 110 - Ground Lesson 5 – Communication and Flight Information
- Read Chapter 5, Sections A, B and C