FAR/AIM, Airports Airspace and Flight Information

Last updated: March 2026

Class 3: References/Resources

Syllabus References:

- Ground Lesson # 5: Instrument FARs
- Ground Lesson # 6: Airports, Airspace & Flight Information

Instrument/Commercial Book:

- FAR/AIM
- GFD I/C Part I, Chapter 3, Section A
    - Chapter 3: Section A “Airports, Airspace & Flight Information

Topics/Subjects Covered

INSTRUMENT FEDERAL AVIATION REGULATIONS

- FAR Part 1
- FAR Part 61
- FAR Part 91
- NTSB 830

Topics/Subjects Covered

- Federal Regulations for Instrument Flight
- Airspace & Flight Information
- Airport Environment
  - Runway Markings
  - Taxiway Markings
  - Airport Signs
  - Runway Incursion Avoidance
  - Land and Hold Short (LAHSO)
  - Approach Light Systems
  - Visual Approach Slope Indicators
  - Runway Lighting
  - Airport Beacons & Obstruction Lights
  - Runway Markings
    - Visual, Non-Precision, Precision Approach Runway
    - Displaced Threshold, Stop way, Demarcation Bar
    - Runway Shoulder
  - Taxiway Markings
    - Centerline
    - Hold Short Lines: Standard & ILS Critical Area
    - Movement/Non-Movement Areas

FAR – Federal Aviation Regulations
CFR 14 & 49

FARs Related to IFR

FEDERAL AVIATION REGULATIONS (FARs) for Instrument Flight Rules

- FAR Part 1
  - Definitions: Read and review
- FAR Part 61
  - Certification of Pilots
- FAR Part 91
  - Rules for Operation
- FAR Part 97
  - Standard Instrument Procedures
- NTSB 830
  - Mishaps, Incidents and Accidents

Instrument rating requirements.

- Found in 14 § 61.65
- “General”, “Aeronautical knowledge” and “Flight proficiency” are common. Need to be at least PPL.
- Aeronautical experience for instrument-airplane rating
  - Must have 50 hours of x-country PIC time (10 in airplanes)
  - 40 hours instrument time (simulated/actual), out of which:
    - 15 with an instructor
    - 250 NM x-country under IFR with 3 different kinds of approaches
    - 3 hours in preparation for the practical test
    - Can it be in a simulator?
      - 10 in BATD, 20 in AATD/FFS, 30 in FFS in a training center
- Part 141 has slightly different requirements

Side note

- If you're looking to do commercial at some point…
- 14 CFR § 61.129 contains required instrument training, may be done concurrently with § 61.51 training.
- Make sure your instructor references it in your logbook.

Instrument Recent experience

- In the past six months
  - Six approaches
    - Simulated to minimums (don't forget to list a safety pilot)
    - In actual past FAF
  - Intercepting and tracking courses through the use of navigational electronic systems
  - Holding procedures and tasks
  - In what aircraft?
    - Airplane
- If your experience lapsed
  - For six months or less
    - Regain proficiency under VFR or in a simulator
  - Or
    - Complete an Instrument Proficiency Check

Part 830

- Not part of Title 14 (Aeronautics and Space) but rather Title 49 (Transportation)
- Covers initial notification of accidents, later reporting, preservation of wreckage and records.

Accident

- Timespan
  - Between when any person boards the aircraft with the intention of flight until all such persons have disembarked
- What happens
  - A person suffers death,

    An injury results in death within 30 days
  - A person suffers serious injury, or

    Hospitalization over 48 hours within 7 days, fracture (other than simple nose/fingers/toes fractures), severe hemorrhage, nerve muscle or tendon damage, involves an internal organ, or 2nd/3rd degree burns or any burns ≥ 5% of the body.
  - The aircraft receives substantial damage

    Damage/failure adversely affecting the structural strength/performance/flight characteristics of an aircraft, normally requiring major repair or replacement.

    NOT engine failure/damage, fairing/cowling damage, skin dent or small holes, ground damage to a prop, landing gear, wheels, tires, flaps, accessories, brakes, wingtips.

Serious incident

- Flight control malfunction
- Crew incapacitation as a result of injury/illness
- In-flight fire
- Aircraft collision in flight
- Damage to other property > $25K
- Release of propeller blade (not due to ground contact)

Immediate notification also required when an overdue aircraft is believed to have been involved in an accident.

Written reports

- 10 days after an accident
- 7 days in case of an overdue aircraft
- Report of an incident – only when requested
- Crewmembers are required to attach written statements.

Reporting Summary

Notifications

Subject of Notification	Recipient	Time Limit	Authority
Motor vehicle action (DUI)	Civil Aviation Security Division	60 days	14 CFR § 61.15 (e)
Change of address	Airman Certification Branch	30 days	14 CFR § 61.60
Accident; Serious Incident, overdue aircraft believed to have been involved in an accident	NTSB	Immediately	49 CFR § 830.15

Reports

Subject of Report	Recipient	Time Limit	Authority
Pilot Deviation (PD) for an emergency	FAA (“The Administrator”)	Upon request	14 CFR § 91.3 (c)
Priority Given (No PD)	Manager of that ATC facility	Upon request, then within 48 hours	14 CFR § 91.123 (d)
Accident	NTSB	10 days	49 CFR § 830.15
Overdue aircraft	NTSB	7 days	49 CFR § 830.15
Serious incident	NTSB	Upon request	49 CFR § 830.15

FAR Part 91 – Instrument Flight Rules 91.167 – 91.193

Instrument Flight Rules

§ 91.167 Fuel requirements for flight in IFR conditions.

§ 91.169 IFR flight plan: Information required.

§ 91.171 VOR equipment check for IFR operations.

§ 91.173 ATC clearance and flight plan required.

§ 91.175 Takeoff and landing under IFR.

§ 91.177 Minimum altitudes for IFR operations.

§ 91.176 Straight-in landing operations below DA/DH or MDA using an enhanced flight vision system (EFVS) under IFR.

§ 91.179 IFR cruising altitude or flight level.

§ 91.180 Operations within airspace designated as Reduced Vertical Separation Minimum airspace.

§ 91.181 Course to be flown.

§ 91.183 IFR communications.

§ 91.185 IFR operations: Two-way radio communications failure.

§ 91.187 Operation under IFR in controlled airspace: Malfunction reports.

§ 91.189 Category II and III operations: General operating rules.

§ 91.191 Category II and Category III manual.

§ 91.193 Certificate of authorization for certain Category II operations.

§ § 91.195-91.199 [Reserved]

Preflight IFR Requirements

91.103 Preflight Action for Flight Under IFR

What you Need to Know Before You Go

- Runway Lengths (VFR Too)
- ATC Delays – required part of standard briefing
- Weather (Icing?)
- Fuel Requirements (What Are They?) 91.167

Fuel requirements for **flight in IFR conditions**.

(a) No person may operate a civil aircraft in IFR conditions unless it carries enough fuel (considering weather reports and forecasts and weather conditions) to--

(1) Complete the flight to the first airport of intended landing;

(2) Except as provided in paragraph (b) of this section, fly from that airport to the alternate airport; and

(3) Fly after that for 45 minutes at normal cruising speed

- Alternates
- Takeoff & Landing Distances (VFR Too)

Preflight IFR Requirements

You are about to depart under IFR and find that your VSI is inoperative ….

1. Can you legally depart IFR? 91.205
2. Does anything still need be done? 91.213

RAIM - GPS Operations

- **Receiver autonomous integrity monitoring (RAIM)** is a technology that assesses the accuracy of GPS signals. It's used in aviation and marine navigation to ensure that GPS signals are reliable.

How RAIM works

- RAIM compares the distance measurements of multiple satellites
- It identifies faulty satellites by looking for outliers, which are pseudoranges that differ significantly from the expected value
- RAIM issues an alert to the pilot if it detects a faulty satellite

RAIM in aviation

- RAIM ensures that the GPS signals used for navigation are accurate
- RAIM has been used in aircraft navigation since the mid-1990s
- RAIM guarantees horizontal error bounds of one nautical mile worldwide
- The FAA supports research into Advanced RAIM (ARAIM), which extends RAIM to other constellations beyond GPS

Preflight GPS Operations

For GPS Operations – TSO 129 Equipment

- Must do a RAIM Prediction Check

"If TSO-C129 equipment is used to solely satisfy the RNAV requirement, GPS RAIM availability must be confirmed for the intended route of flight (route and time) using current GPS satellite information." AC 90-100

- Both departure (if flying an RNAV DP) and destination airports must be checked.
- RAIM must be predicted to exist continuously during the planned flight

"In the event of a predicted, continuous loss of RAIM of more than five (5) minutes for any part of the intended flight, the flight should be delayed, canceled, or re-routed where RAIM requirements can be met." AC 90-100

GPS Operations

How Can A RAIM Check Be Done?

1. Call Flight Service (within 24 hours of ETA)
2. Go to sapt.faa.gov
3. Complete a RAIM check on your GPS
4. GPS provides 2-5 meter accuracy or better

WAAS enabled GPS does not need RAIM check

Check RAIM on the Avidyne

2) Calculators

1) Utilities

3) Scroll to Raim Prediction

Alternates

You always file an alternate unless you can meet

91.169
123 Rule

1 hour before to 1 hour after ETA

2,000' ceiling AND

3 miles visibility

- Required weather in your alternate:
  - Has a precision approach: 600' AGL ceiling, 2SM visibility
  - Only has non-precision approaches: 800' AGL ceiling, 2SM visibility

- What if destination has no approaches?
- What if alternate has no approaches?
- Does my equipment affect alternate filing?

Alternates

If destination has no approach, you must file an alternate regardless of weather FAR 91.169

If alternate has no approach, you must be able to descend from the MEA, approach, and land under VFR FAR 91.169

If only GPS equipped (non-WAAS), alternate cannot have only GPS approaches (alternate needs VOR/LOC), unless certain conditions are met AIM 1-1-17 5(d)

If WAAS equipped, this restriction is removed so a single WAAS receiver is legal AIM 1-1-18

Paper or Plastic Charts?

Are charts of any kind required by regulation? Electronic charts are governed by AC 91-78

6. REMOVAL OF PAPER FROM THE COCKPIT FOR OPERATIONS UNDER PART 91

EFBs/ECDs can be used during all phases of flight operations in lieu of paper reference material when the information displayed meets the following criteria:

(1) The components or systems onboard the aircraft which display precomposed or interactive information are the functional equivalent of the paper reference material.

(2) The interactive or precomposed information being used for navigation or performance planning is current, up-to-date, and valid.

Class 1 Device – Portable
Class 2 Device – Mountable
Class 3 Device - Installed

Airports and Airspace

Definitions

Airways

- **AIRWAY**
  - A class E airspace area established in the form of a corridor, the centerline of which is defined by radio navigational aids
  - Dimensions: An airway includes the airspace within parallel boundary lines 4nm to each side of the centerline. The airspace has a floor of 1200' AGL unless otherwise specified.
- **LOW ALTITUDE AIRWAY STRUCTURE**
  - Up to but not including 18,000' MSL
- **JET ROUTE**
  - FL180 up to and including FL450

Definitions

Weather Reporting

- **AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS)**
  - The continuous broadcast of recorded non-control information in selected terminal areas. Its purpose is to improve controller effectiveness and to relieve frequency congestion by automating the repetitive transmission of essential but routine information
- **AUTOMATED WEATHER SYSTEM**
  - Any of the automated weather sensor platforms that collect weather data at airports and disseminate the weather information via radio and/or landline.
    - Automated Surface Observing System (ASOS)
    - Automated Weather Sensor System (AWSS)
    - Automated Weather Observation System (AWOS)

Definitions

Weather Reporting Cont.

- **ASOS vs. AWOS**
  - ASOS is more sophisticated than AWOS
  - ASOS can determine:
    - Type and intensity of precipitation <Rain, Snow and Freezing Rain>
    - Thunderstorms
    - Obstructions to visibility <Fog or Haze>
    - Wind shifts and or peak gusts
    - Rapid pressure change
- **AWOS A01 vs. A02**
  - A01 – a station without a precipitation ID sensor
  - A02 – a station with a precipitation ID sensor

Airspace

AIM 3-1-1

There are 2 categories of airspace or airspace areas:

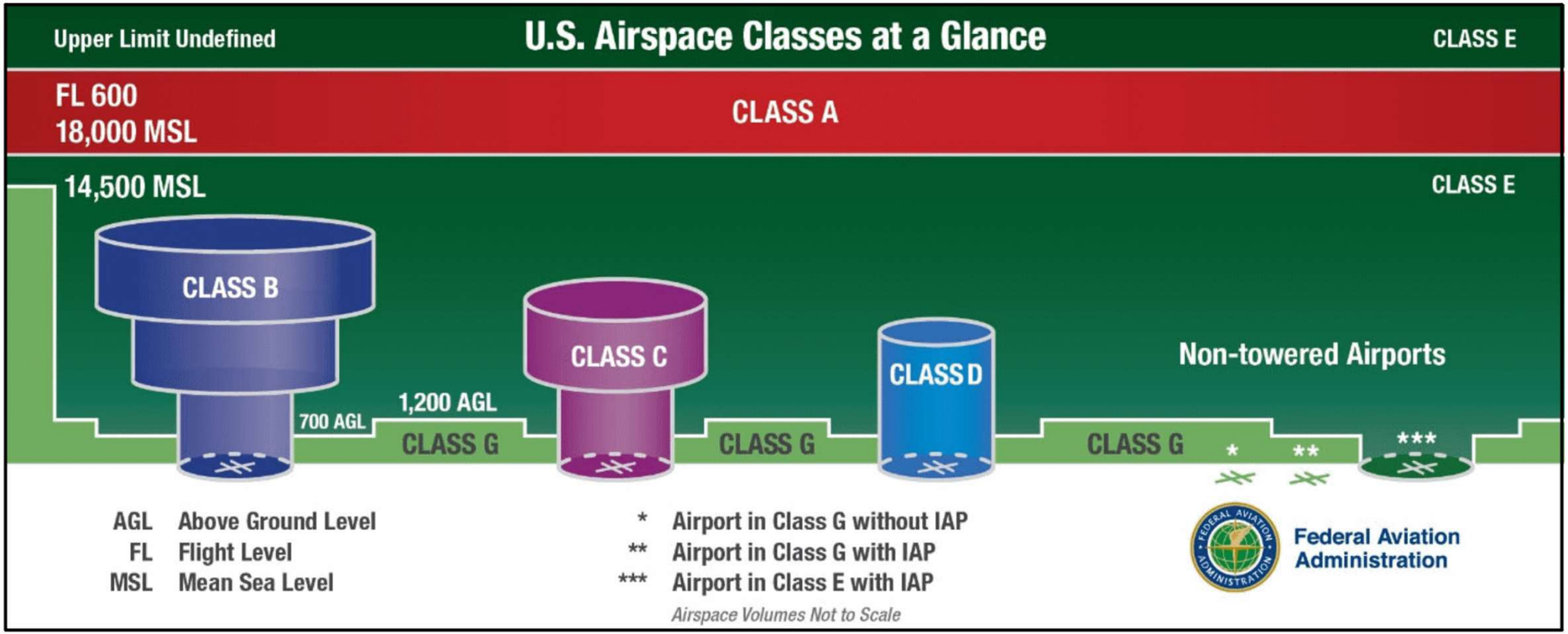
1. **REGULATORY**
   - Class A,B,C,D and E airspace
   - Restricted and prohibited areas included
2. **NON-REGULATORY**
   - Military Operations Areas (MOAs)
   - Warning Areas
   - Alert Areas
   - Controlled Firing Areas

Categories & Classes of Airspace in the US

- Uncontrolled
  - Class G
  - No ATC services available for VFR or IFR traffic
- Controlled
  - ATC services available (but not always mandatory)
  - Class E – optional for VFR, mandatory for IFR
  - Class D – mandatory for VFR+IFR
  - Class C – mandatory for VFR+IFR
  - Class B – mandatory for VFR+IFR
  - Class A – mandatory for IFR

Airspace in the “good old days”

Became this


Upper Limit Undefined
U.S. Airspace Classes at a Glance
CLASS E
FL 600
18,000 MSL
CLASS A
14,500 MSL
CLASS E
CLASS B
CLASS C
CLASS D
Non-towered Airports
700 AGL
1,200 AGL
CLASS G
CLASS G
CLASS G
*
**
***
AGL Above Ground Level
FL Flight Level
MSL Mean Sea Level
* Airport in Class G without IAP
** Airport in Class G with IAP
*** Airport in Class E with IAP
Airspace Volumes Not to Scale
Federal Aviation Administration

Class G Airspace

Overview

- Uncontrolled airspace not designated A, B, C, D, or E
- Starts at the surface to the overlying controlled airspace (typically 700 or 1,200 AGL)

Operating Rules

- ATC has no authority/responsibility to control class G traffic
- No minimal equipment
- No minimal certificate
- No separation services of any kind
- 250 IAS below 10,000 MSL

Class G	
VFR min Vis & Clearance 1,200' AGL or less	Day: 1 s.m. Clear of Clouds Night: 3 s.m. 500' Below 1,000' Above 2,000' Horiz
VFR Minimum Visibility	Below 10,000' MSL – Day: 1 s.m. Night: 3 s.m. At/Above 10,000 MSL – 5 s.m.
VFR Min Cloud Clearance	Below 10,000' - 500' Below 1000' Above 2,000' Horiz Above 10,000' – 1,000' Below 1,000' Above 1 s.m. Horiz
Min Pilot Qualifications	Student Pilot
VFR Entry and Equipment	None
ATC Services	VFR advisories on request (permitting)

Class E Airspace

Controlled airspace not A, B, C, or D

Transponder Requirements

- At or above 10,000’ MSL (excluding at & below 2,500’ AGL)
- Within 30 nm of a class B primary airport, below 10,000’ MSL
- Within and above all Class C airspace up to 10,000’ MSL
- Within 10 nm of designated airport
- Flying into, within, or across the ADIZ

ADS-B Out Requirements

- At and above 10,000’ MSL (excluding at and below 2,500’ AGL)
- At and above 3,000’ MSL over Gulf of Mexico within 12 nm of the coast

Airspeed Limits

- 250 knots below 10,000’ MSL
- 200 knots below 2,500’ AGL within 4 nm of a Class C or D airport
- 200 knots underlying Class B or a VFR corridor through Class B

Class E	
VFR Minimum Visibility	Below 10,000’ MSL - 3 sm Above 10,000’ MSL - 5 sm
VFR Min Cloud Clearance	Below 10,000’ - 500’ Below 1000’ Above 2,000’ Horiz Above 10,000’ - 1,000’ Below 1,000’ Above 1 s.m. Horiz
Min Pilot Qualifications	Student Pilot
VFR Entry and Equipment	As specified: Mode C Transponder & ADS-B
ATC	IFR/IFR Separation VFR advisories on request (permitting)

Class E Airspace (cont.)

ATC Services

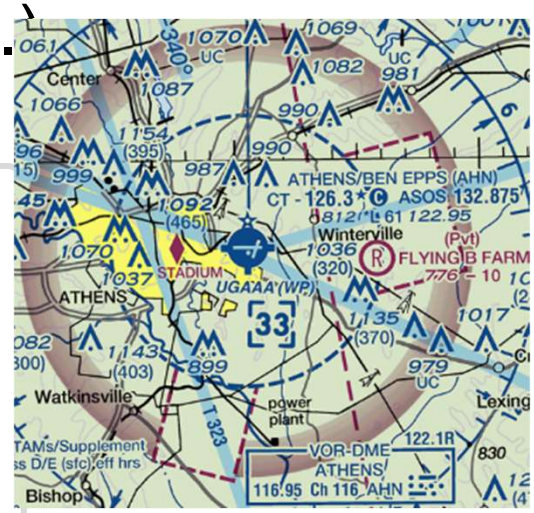
- VFR: No communication requirements, but can request traffic advisories
- IFR: ATC communication is required

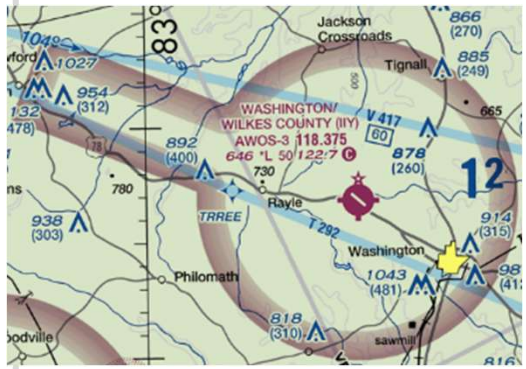
Vertical Limits

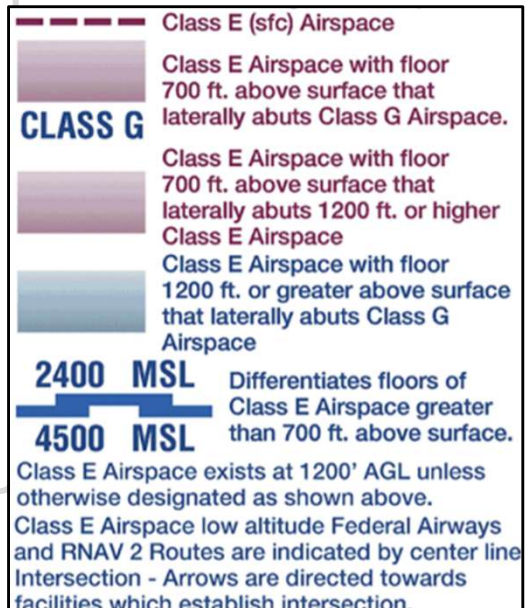
- Unless designated lower, 14,500’ to 17,999’ MSL over
- Surface or designated altitude to overlying/adjacent controlled airspace

Segments

- Low Altitude Airway System
  - Airways: 1,200’ AGL up to, but not including 18,000’ MSL; Normally 8 nm wide
- Airports
  - Extension to a surface area transition
  - Controlled airspace for IFR traffic moving between enroute/airport environments
- When needed for IFR control purposes







Class D Airspace

Overview

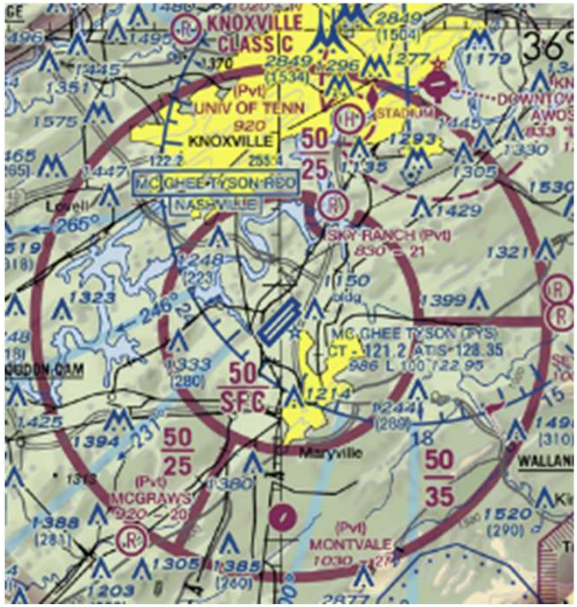
- Most towered airports in the United States
- Surface to 2,500’ above airport elevation
- 4 nm radius
- Part time control tower (Class E/G when tower is closed)
- Configured to meet the needs and procedures of the area

Operating Rules

- Certification: No specific certification required
- Max speed 200 KIAS 4 NM/2,500
- Separation between IFR + Special VFR traffic
- TPA 1,000 AGL, 1,500 AGL for turbine/large aircrafts.
- Equipment: Two-way radio
  - Must establish two-way communication before entering

Class D	
VFR Minimum Visibility	3 Statute Miles
VFR Min Cloud Clearance	500’ Below 1000’ Above 2,000’ Horiz
Min Pilot Qualifications	Student Pilot
VFR Entry and Equipment	Establish Radio Communication
ATC Services	IFR/IFR Separation

Class C Airspace



Overview

- Surface to 4,000’ above airport elevation
  - 5 nm radius core – surface to 4,000’
  - 10 nm radius shelf – 1,200’ to 4,000’
- Control tower & approach control
- About 120 medium-sized airports in the United States

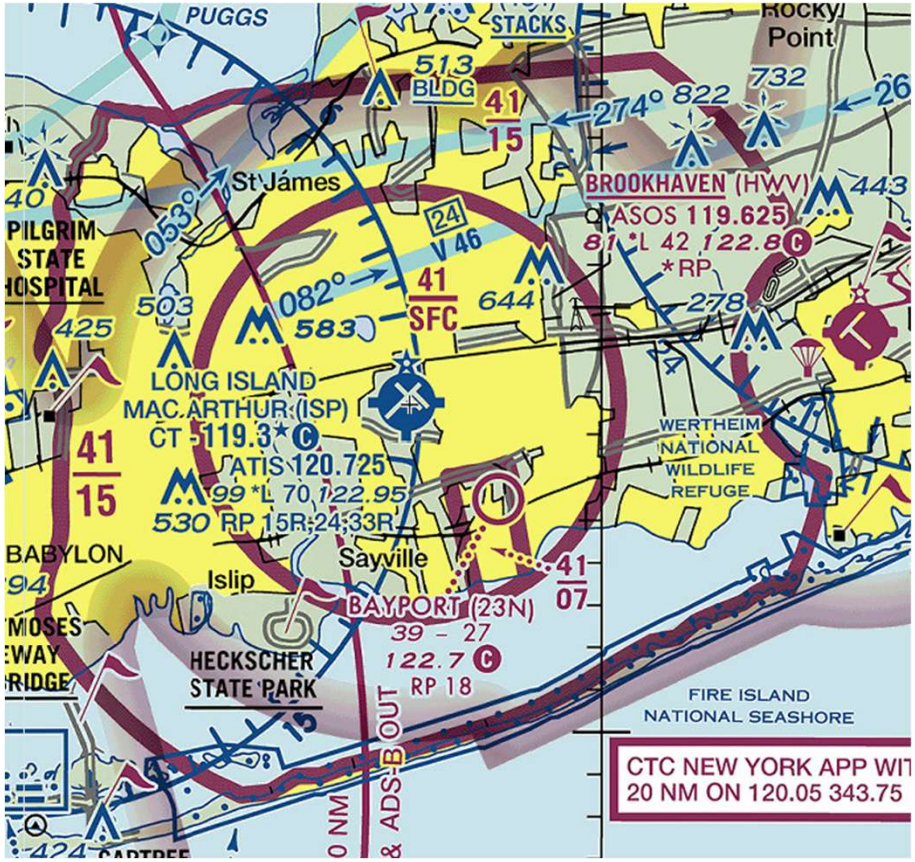
Operating Rules

- Pilot Certification: No specific certification required
  - Equipment: Two-way radio, Mode C transponder, ADS-B Out
  - Must establish communication before entering
- ADS-B Out required in and above Class C up to 10,000’ MSL
- Max speed 200 KIAS 4 NM/2,500
- Separation between IFR, and between IFR and participating VFR

Class C	
VFR Minimum Visibility	3 Statute Miles
VFR Min Cloud Clearance	500’ Below 1000’ Above 2,000’ Horiz
Min Pilot Qualifications	Student Pilot
VFR Entry and Equipment	Establish Radio Communication Mode C Transponder ADS-B
ATC Services	IFR/IFR & VFR Separation VFR Traffic advisories (permitting)

Operation out of a satellite airport in proximity to Class C

- When departing
  - Establish and maintain two-way radio communications with the ATC facility having jurisdiction over the Class D airspace area as soon as practicable after departing
- When arriving
  - Will be transferred by ATC with sufficient time to contact ATC or advisory frequency



Class B Airspace

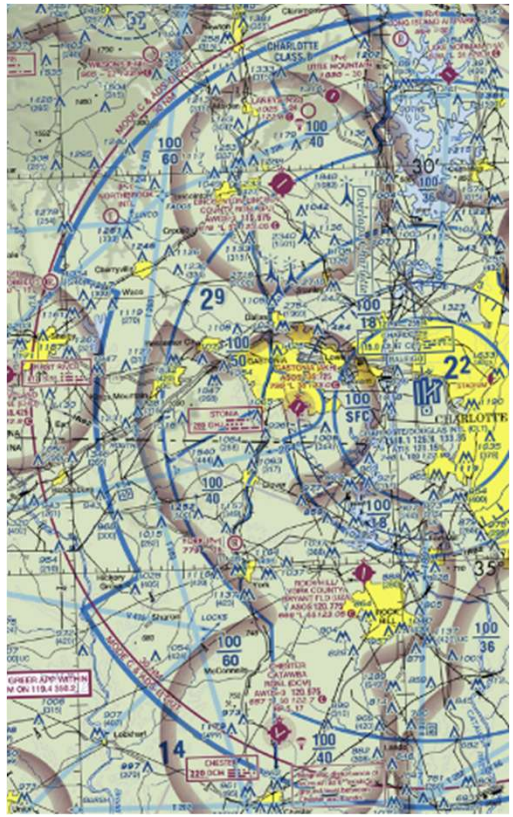
Overview

- Surface to 10,000’ MSL & used at the nation’s busiest airports
  - Upside down wedding cake
  - Altitudes and layers are tailored to the needs of the area
  - 37 largest airports in the united states

Operating Rules

- Certification: At least a private pilot certificate is required
  - Exception: Student/Rec/Sport pilot with endorsement
  - Exception to the exception: No solo ops at certain airports (AIM 3-2-3b)
- When VFR: explicit clearance required “Cleared into the Bravo”; when IFR route clearance provides clearance
- Max speed 250 in Class B; 200 KIAS below Class B or in VFR corridor
- Air traffic control provides separation

- Equipment:
  - ATC clearance is required before entering
  - Mode C Veil: Transponder required within 30 nm of airport up to 10,000’ MSL
  - ADS-B Out required in and above Class B up to 10,000’ MSL
    - Surface to 10,000’ within 30 NM of certain airports



Class B	
VFR Minimum Visibility	3 Statute Miles
VFR Min Cloud Clearance	Clear of Clouds
Min Pilot Qualifications	Private Pilot Learner w/Endorsement
VFR Entry and Equipment	ATC Clearance Mode C Transponder ADS-B
ATC Services	All Aircraft Separation

Class A

Overview

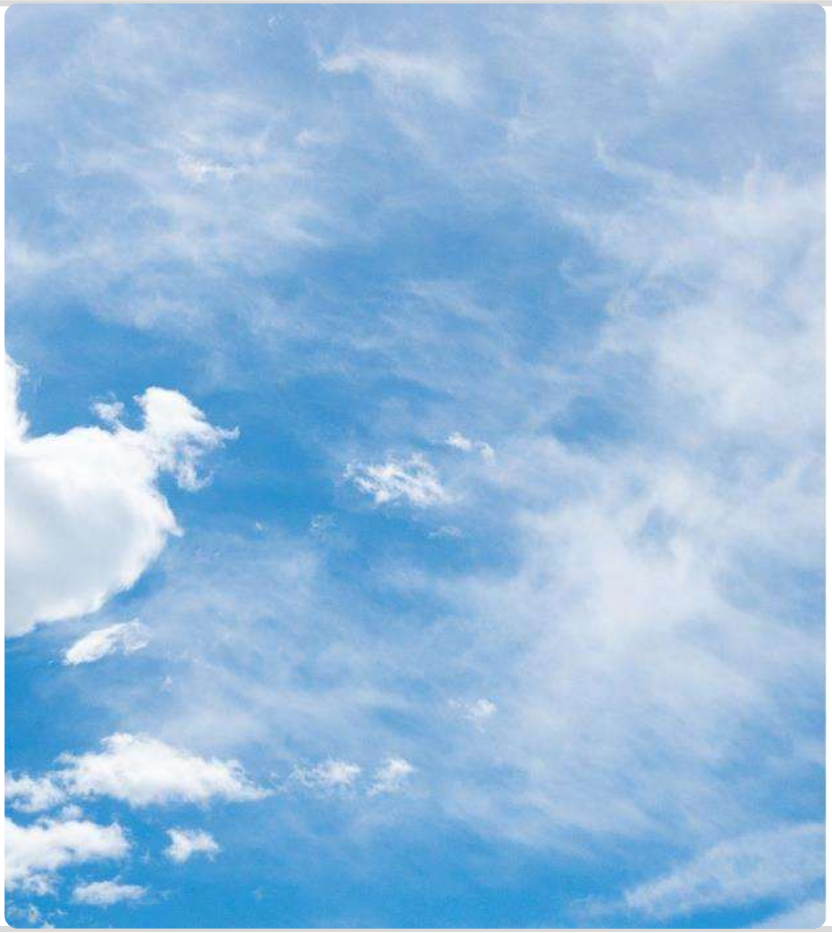
- 18,000’ MSL up to and including FL600

Operating Rules

- All operations conducted under IFR
- Full separation provided

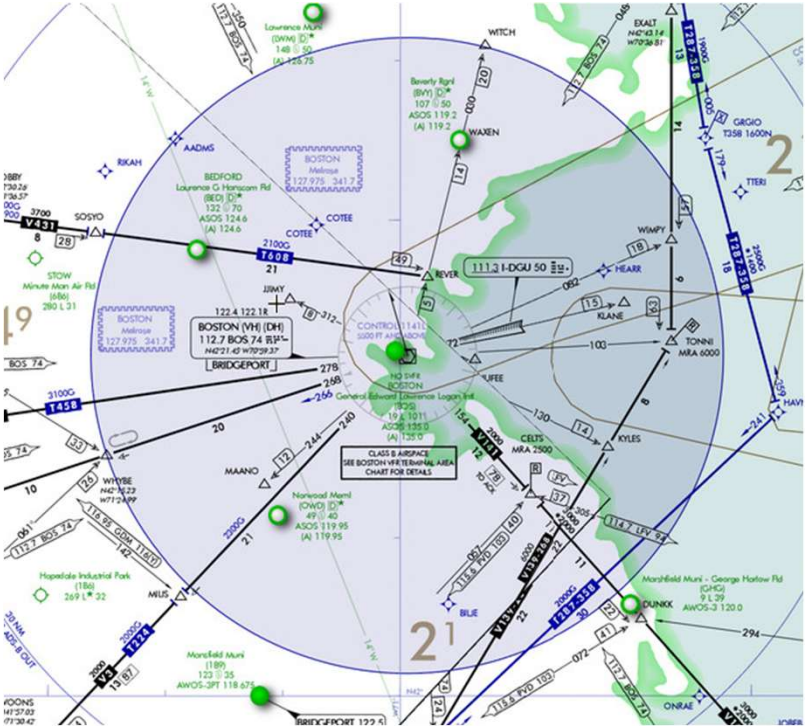
ADS-B Out

- Required in Class A airspace

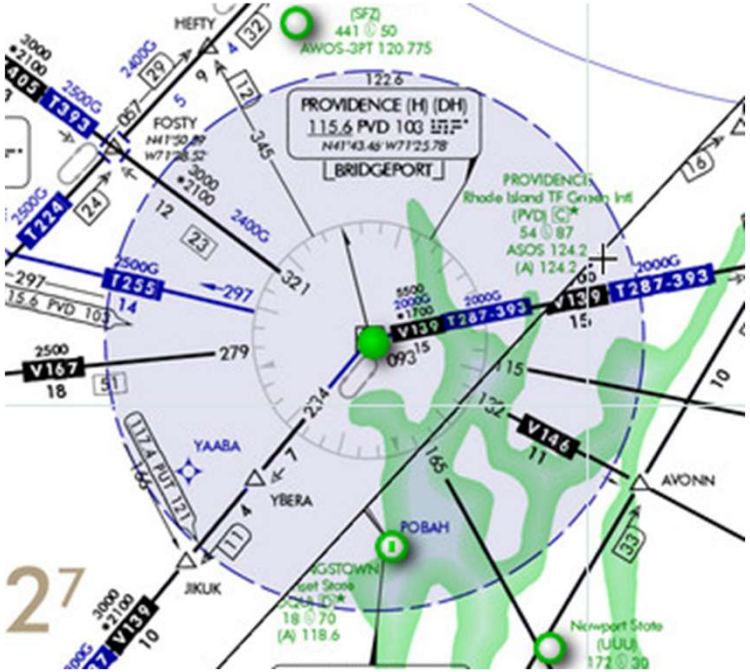


Airspace on IFR Chart

Class B Limits



Class C Limits



Class D

- IFR charts show at most the outer limits of airspace
- Class B is a solid outer ring, Class C is a dashed outer ring
  - Class D has no markings

Special VFR

Clearance to operate under VFR with less than VFR weather minimums

- Class B, C, D, or E surface areas below 10,000’ MSL
- Must be requested by the pilot

May only be conducted

- With an ATC clearance
- Clear of clouds
- At least 1 SM flight visibility
- At night: Instrument rated pilot and aircraft required

Prohibited at certain airports

- Part 91 Appendix D Section 3

When should you use Special VFR?
When are we allowed to use Special VFR at the Aero Club?

Airspace Summary

Class Airspace	Entry Requirements	Equipment	Minimum Pilot Certificate
A	ATC Clearance	IFR Equipped	Instrument Rating
B	ATC Clearance	Two-way radio Transponder with altitude reporting capability ADS-B	Private – with exception
C	Two-way radio communications prior to entry	Two-way radio Transponder with altitude reporting capability ADS-B	No specific requirement
D	Two-way radio communications prior to entry	Two-way radio	No specific requirement
E	None for VFR	Transponder, as specified ADS-B, as specified	No specific requirement
G	None	No specific requirement	No specific requirement

Special Use Airspace

Prohibited Areas
- Flight is prohibited for reasons associated with national welfare

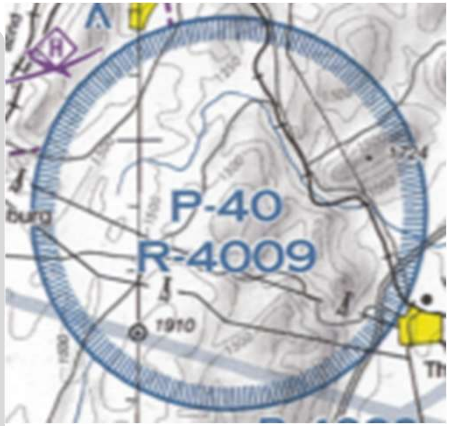
Restricted Areas
- Not wholly prohibited, but subject to restrictions; Hazardous

Warning Areas
- Extend from 3 nm outward from coasts, potentially hazardous activity

Military Operations Areas (MOAs)
- Separate military training from IFR traffic. No restriction for VFR

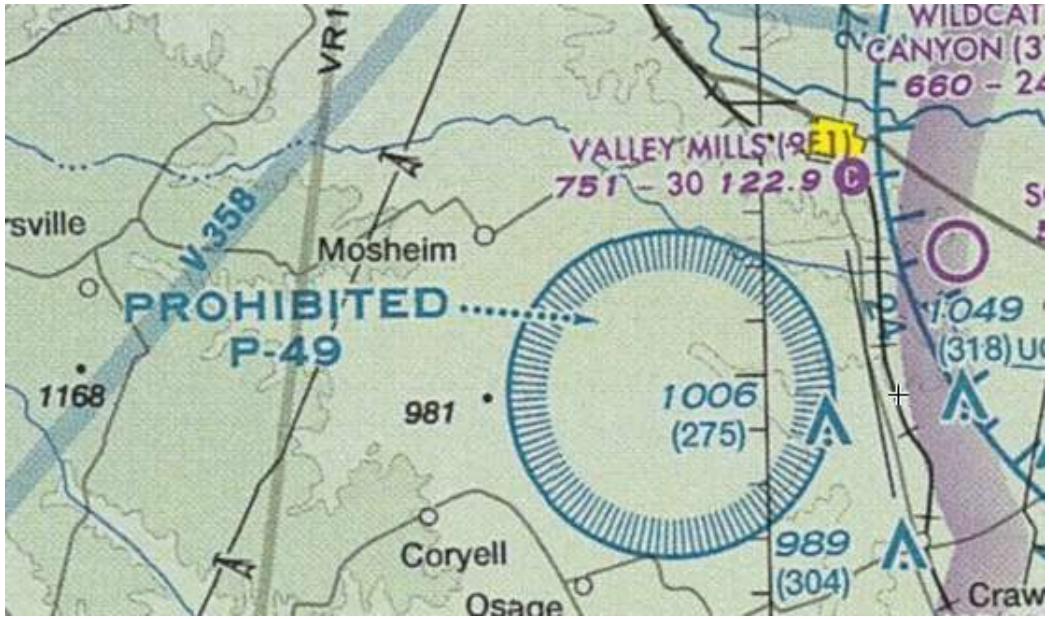
Alert Areas
- Alert pilots to high volumes of training or unusual activity

Controlled Firing Areas
- Hazardous activities; suspended when an aircraft is approaching



Prohibied Areas

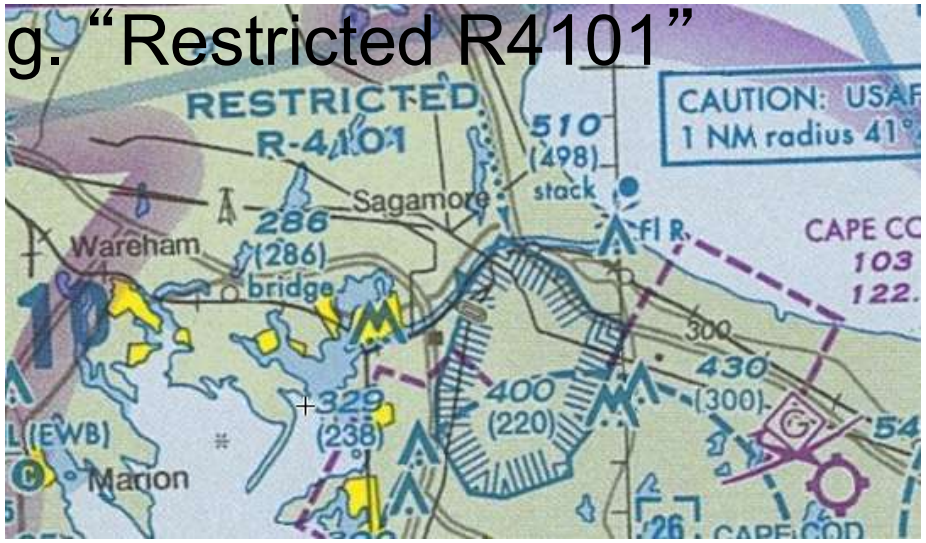
- Flight is NOT permitted here, EVER
- Established for national security
- Examples: White House, Camp David
- i.e. “Prohibited P-31”



Bush’s Ranch in Crawford, TX

Restricted Areas

- Areas where operations may be hazardous to non-participating aircrafts
- Flight is not necessarily prohibited, but subject to restrictions
- Must obtain clearance from ATC to enter (generally IFR aircraft)
- Activities may include military aerial training, artillery firing, etc.
- e.g. “Restricted R4101”

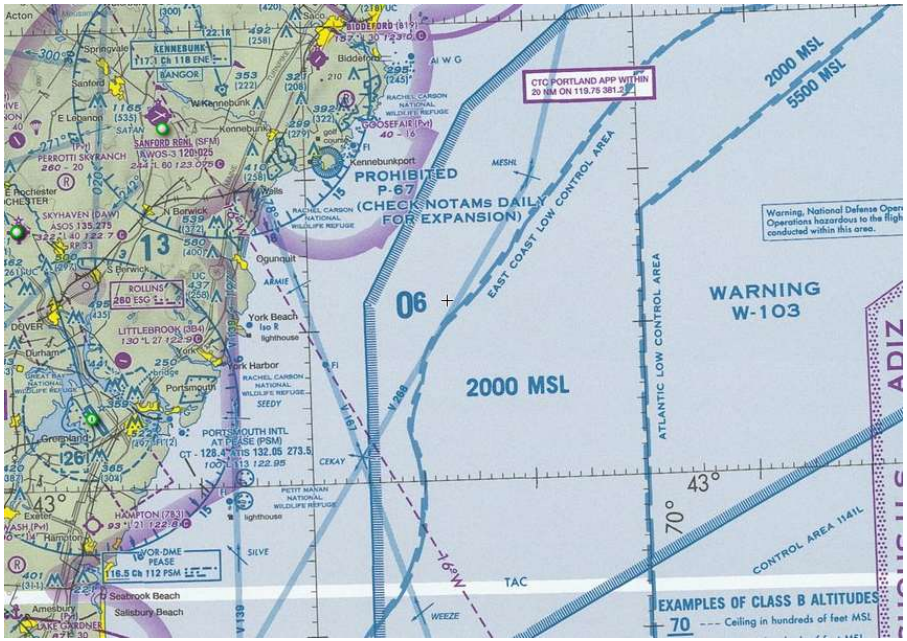


Test range on the Cape

Ft. Devens (near KBED)

Warning Areas

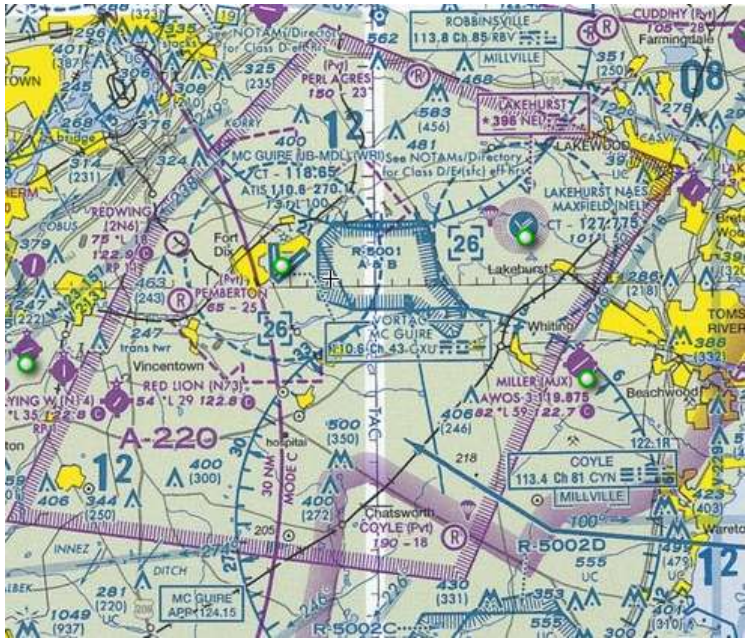
- Similar in nature to Restricted Areas
- Activity may be hazardous to non-participating aircraft
- US government does not have sole jurisdiction
- Extending from 12nm off the US coast outward
- i.e. “Warning W-237”



Warning Area off Maine

Alert Areas

- Meant to inform non-participating aircraft of the possibility of a high volume of training or other unusual activities
- No clearance required
- Participating and non-participating aircraft shall maintain responsibility for see-and-avoid
- i.e. “Alert A-209”



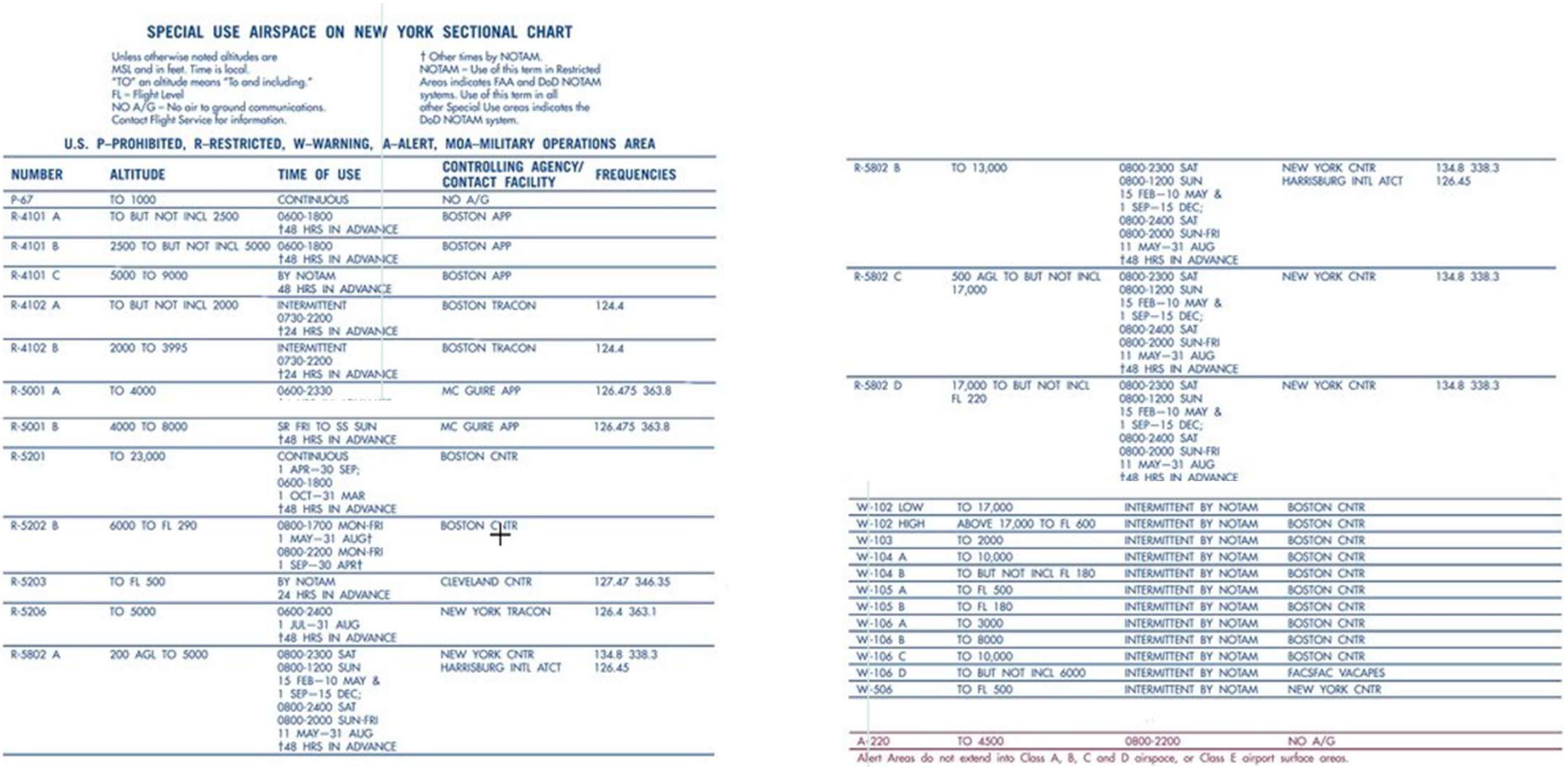
Alert A-220 east of Philadelphia

Controlled Firing Areas

- Contain activities, which if not conducted in a controlled environment, would pose a hazard to aircraft
- Primary distinction: when an aircraft is detected approaching the area, activities must be suspended
- Not marked on charts

Special Use Airspace – more info

- Sectional Legend
- NOTAMS



SPECIAL USE AIRSPACE ON NEW YORK SECTIONAL CHART

Unless otherwise noted altitudes are MSL and in feet. Time is local.
"TO" an altitude means "To and including."
FL – Flight Level
NO A/G – No air to ground communications.
Contact Flight Service for information.

† Other times by NOTAM.
NOTAM – Use of this term in Restricted Areas indicates FAA and DoD NOTAM systems. Use of this term in all other Special Use areas indicates the DoD NOTAM system.

U.S. P–PROHIBITED, R–RESTRICTED, W–WARNING, A–ALERT, MOA–MILITARY OPERATIONS AREA

NUMBER	ALTITUDE	TIME OF USE	CONTROLLING AGENCY/ CONTACT FACILITY	FREQUENCIES
P-67	TO 1000	CONTINUOUS	NO A/G	
R-4101 A	TO BUT NOT INCL 2500	0600-1800 †48 HRS IN ADVANCE	BOSTON APP	
R-4101 B	2500 TO BUT NOT INCL 5000	0600-1800 †48 HRS IN ADVANCE	BOSTON APP	
R-4101 C	5000 TO 9000	BY NOTAM 48 HRS IN ADVANCE	BOSTON APP	
R-4102 A	TO BUT NOT INCL 2000	INTERMITTENT 0730-2200 †24 HRS IN ADVANCE	BOSTON TRACON	124.4
R-4102 B	2000 TO 3995	INTERMITTENT 0730-2200 †24 HRS IN ADVANCE	BOSTON TRACON	124.4
R-5001 A	TO 4000	0600-2330	MC GUIRE APP	126.475 363.8
R-5001 B	4000 TO 8000	SR FRI TO SS SUN †48 HRS IN ADVANCE	MC GUIRE APP	126.475 363.8
R-5201	TO 23,000	CONTINUOUS 1 APR–30 SEP; 0600-1800 1 OCT–31 MAR †48 HRS IN ADVANCE	BOSTON CNTR	
R-5202 B	6000 TO FL 290	0800-1700 MON-FRI 1 MAY–31 AUG† 0800-2200 MON-FRI 1 SEP–30 APR†	BOSTON CNTR	
R-5203	TO FL 500	BY NOTAM 24 HRS IN ADVANCE	CLEVELAND CNTR	127.47 346.35
R-5206	TO 5000	0600-2400 1 JUL–31 AUG †48 HRS IN ADVANCE	NEW YORK TRACON	126.4 363.1
R-5802 A	200 AGL TO 5000	0800-2300 SAT 0800-1200 SUN 15 FEB–10 MAY & 1 SEP–15 DEC; 0800-2400 SAT 0800-2000 SUN-FRI 11 MAY–31 AUG †48 HRS IN ADVANCE	NEW YORK CNTR HARRISBURG INTL ATCT	134.8 338.3 126.45
R-5802 B	TO 13,000	0800-2300 SAT 0800-1200 SUN 15 FEB–10 MAY & 1 SEP–15 DEC; 0800-2400 SAT 0800-2000 SUN-FRI 11 MAY–31 AUG †48 HRS IN ADVANCE	NEW YORK CNTR HARRISBURG INTL ATCT	134.8 338.3 126.45
R-5802 C	500 AGL TO BUT NOT INCL 17,000	0800-2300 SAT 0800-1200 SUN 15 FEB–10 MAY & 1 SEP–15 DEC; 0800-2400 SAT 0800-2000 SUN-FRI 11 MAY–31 AUG †48 HRS IN ADVANCE	NEW YORK CNTR	134.8 338.3
R-5802 D	17,000 TO BUT NOT INCL FL 220	0800-2300 SAT 0800-1200 SUN 15 FEB–10 MAY & 1 SEP–15 DEC; 0800-2400 SAT 0800-2000 SUN-FRI 11 MAY–31 AUG †48 HRS IN ADVANCE	NEW YORK CNTR	134.8 338.3
W-102 LOW	TO 17,000	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-102 HIGH	ABOVE 17,000 TO FL 600	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-103	TO 2000	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-104 A	TO 10,000	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-104 B	TO BUT NOT INCL FL 180	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-105 A	TO FL 500	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-105 B	TO FL 180	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-106 A	TO 3000	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-106 B	TO 8000	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-106 C	TO 10,000	INTERMITTENT BY NOTAM	BOSTON CNTR	
W-106 D	TO BUT NOT INCL 6000	INTERMITTENT BY NOTAM	FACSFAC VACAPES	
W-506	TO FL 500	INTERMITTENT BY NOTAM	NEW YORK CNTR	
A-220	TO 4500	0800-2200	NO A/G	

Alert Areas do not extend into Class A, B, C and D airspace, or Class E airport surface areas.

Other Airspace

Special Flight Rules Area
- Airspace governed by rules specific to the area (described in Part 93)

Local Airport Advisory (LAA)
- Area within 10 sm of an airport without a control tower, but with an FSS

Military Training Route (MTR)
- Routes used by military aircraft to practice tactical flying

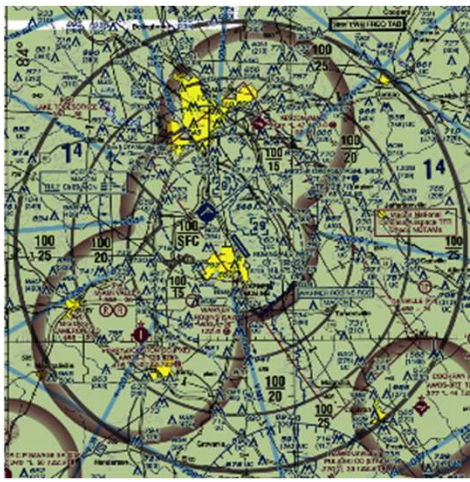
Temporary Flight Restrictions (TFR)
- Restricted flight around a certain area; Designated by an FDC NOTAM

Parachute Jump Areas

Published VFR Route
- For transitioning around, under, or through complex airspace

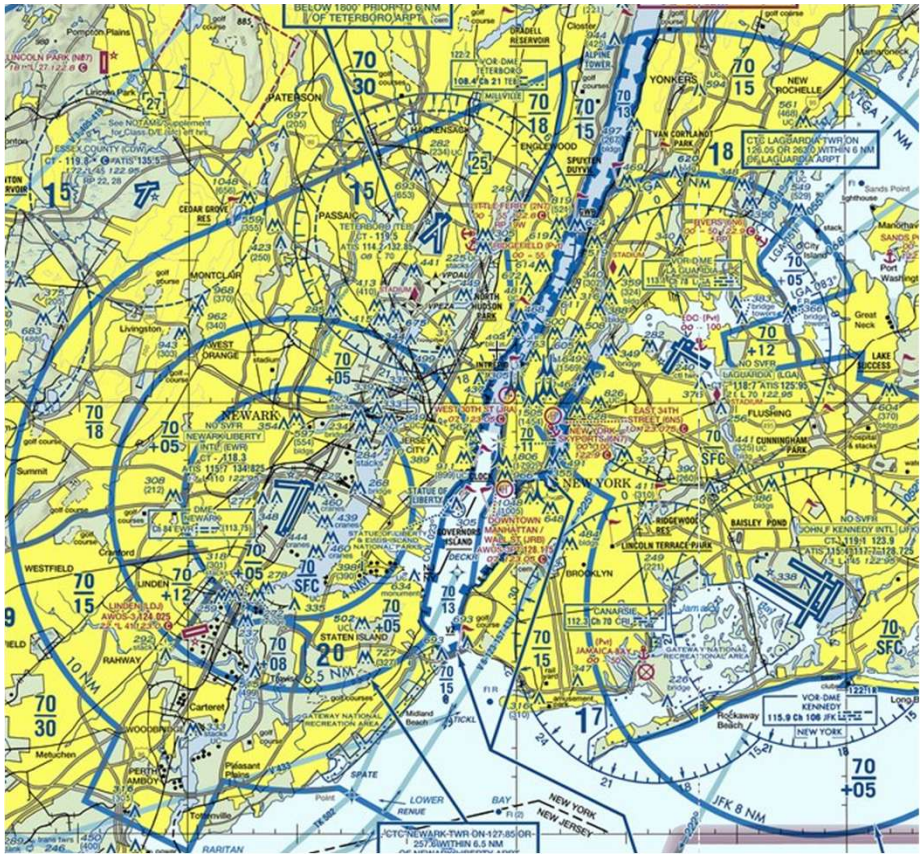
Terminal Radar Service Area (TRSA)
- Areas where pilots can voluntarily receive radar services

National Security Area
- Requirement for increased security and safety of ground facilities



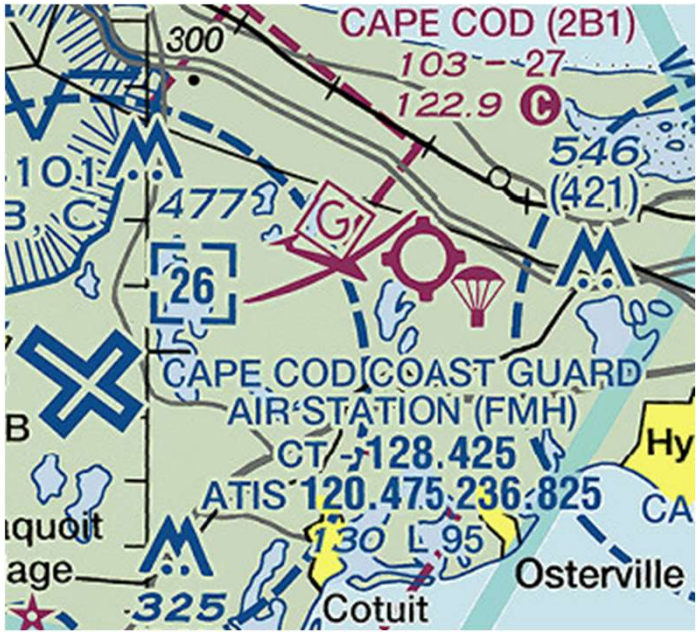
Special Flight Rules Area (SFRA)

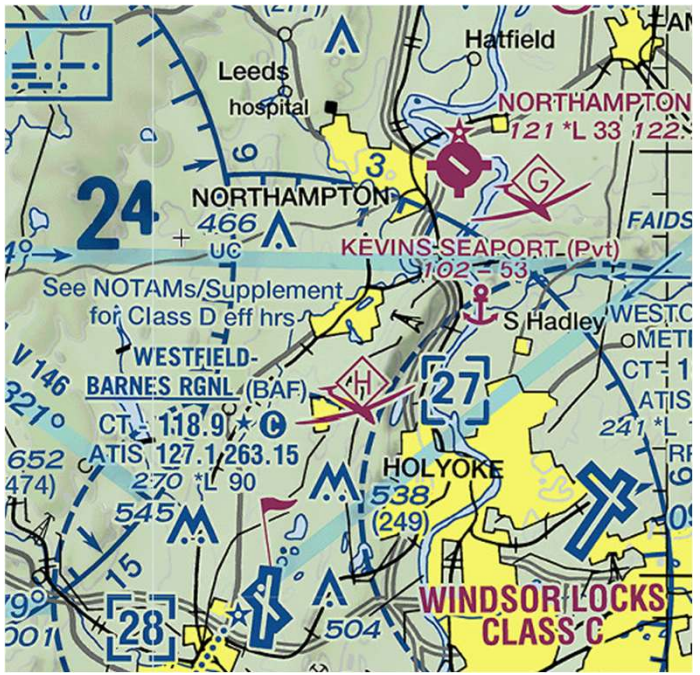
- A region in which the normal regulations of flight do not apply in whole or in part, e.g. regulations concerning airspace classification, entry/exit altitude, course, and speed restrictions.
- Each of them enumerated in a subpart of 14 CFR 93, sometimes in Chart Supplement as well.
- Notable:
  - Subpart E: Niagara Falls
  - Subpart V: Washington DC
  - Subpart W: New York VFR Corridor



Glider + Parachuting areas

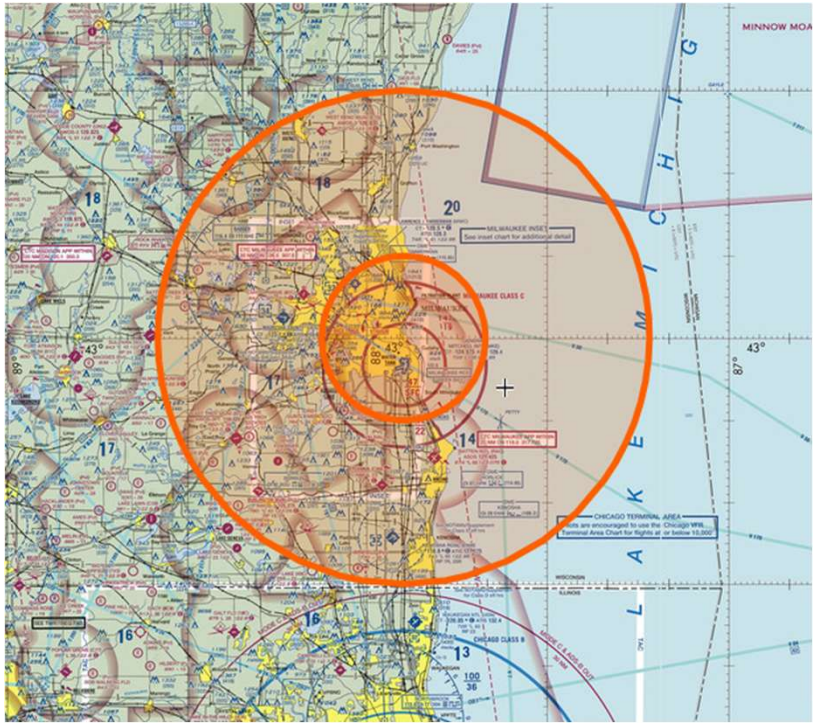
- Identified on the sectional and TAC charts
- Chart supplements for airports in the vicinity will list jump times
- NOTAMs will be issued for additional times
- ATC facility can provide updates upon request
  - ATC may advice on their sector frequency when jumping operations commence





Temporary Flight Restrictions

- Temporary in nature, activated by NOTAM
- Information via briefing, EFB or tfr.faa.gov
- Examples: VIPs (President: 30 NM radius, VP: 3 NM radius), major sports events (e.g. MLB, NFL, Boston Marathon), air shows, space launch
- When able – listen on 121.5

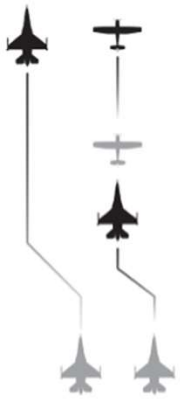


In-flight intercept procedures

Fighter Aircraft:	Meaning:	Intercepted Aircraft:
Approaches pilot-side of aircraft and matches speed and heading. (Nighttime) Will also flash navigation lights.	You have been intercepted.	(Daytime) Rock wings to acknowledge. (Nighttime) Rock wings and flash navigation lights to acknowledge.
Initiates a slow, level turn.	Follow me. Fly this way.	Match heading and follow. Continue on heading in direction of fighter.
Initiates abrupt turn across nose; may dispense flares.	Warning! Turn now in direction of fighter.	Immediately match heading and follow.
Circles airport, lowers landing gear, and overflies runway in direction of landing. (Nighttime) Will also turn on landing lights.	Land at this airport.	Lower landing gear (if equipped) and land on runway. If airport inadequate, raise landing gear (if equipped) while flying over runway and flash landing lights. Continue to circle airport between 1,000-2,000 feet until fighter signals to follow to alternate airport.
Performs the breakaway maneuver.	Fighter understands intercepted aircraft's intentions.	If cannot comply, switch on and off all available lights at *regular* intervals. If in distress, switch on and off all available lights at *irregular* intervals.

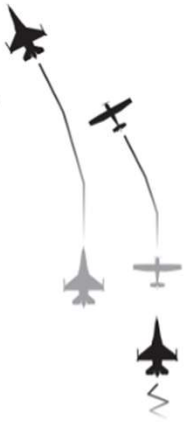
Approach & Identification

Typically two fighter jets approach from the rear. One fighter flies around to make visual contact with the pilot. This may also be conducted with a law enforcement helicopter.



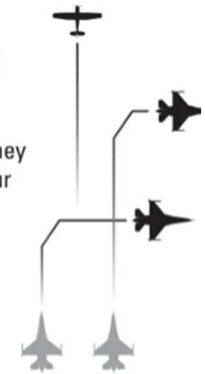
Fly This Way

A slow turn by a fighter jet indicates that you should follow in the same direction. Be cautious of wake turbulence.



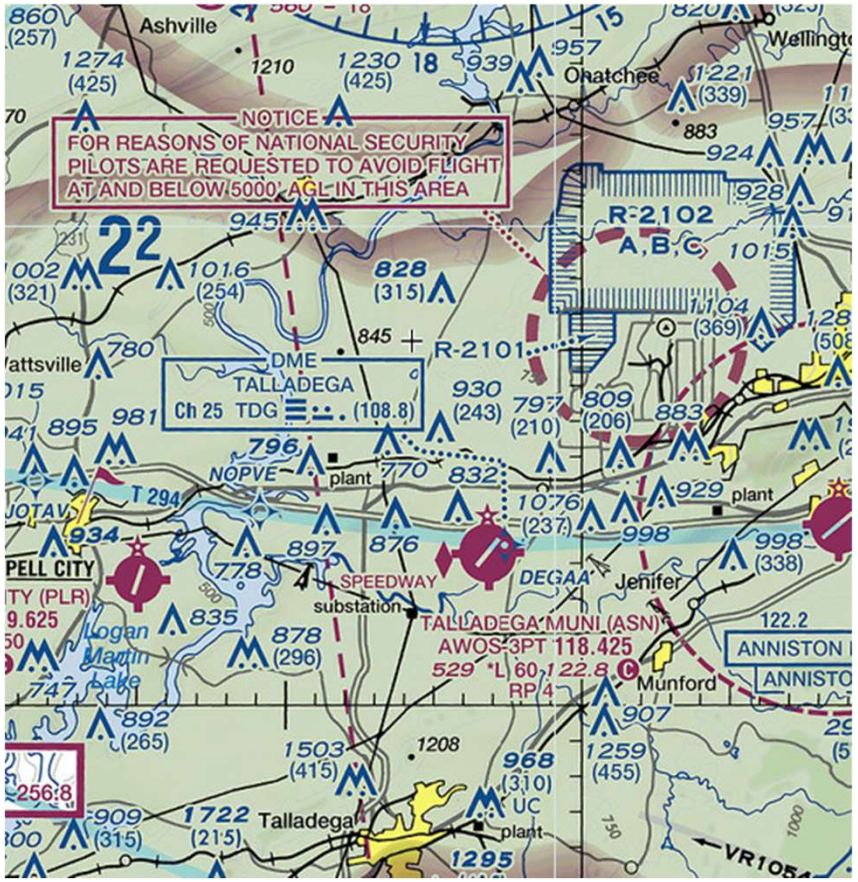
Breakaway Maneuver

Fighter jets will abruptly break away from pursuit when they understand your intensions.



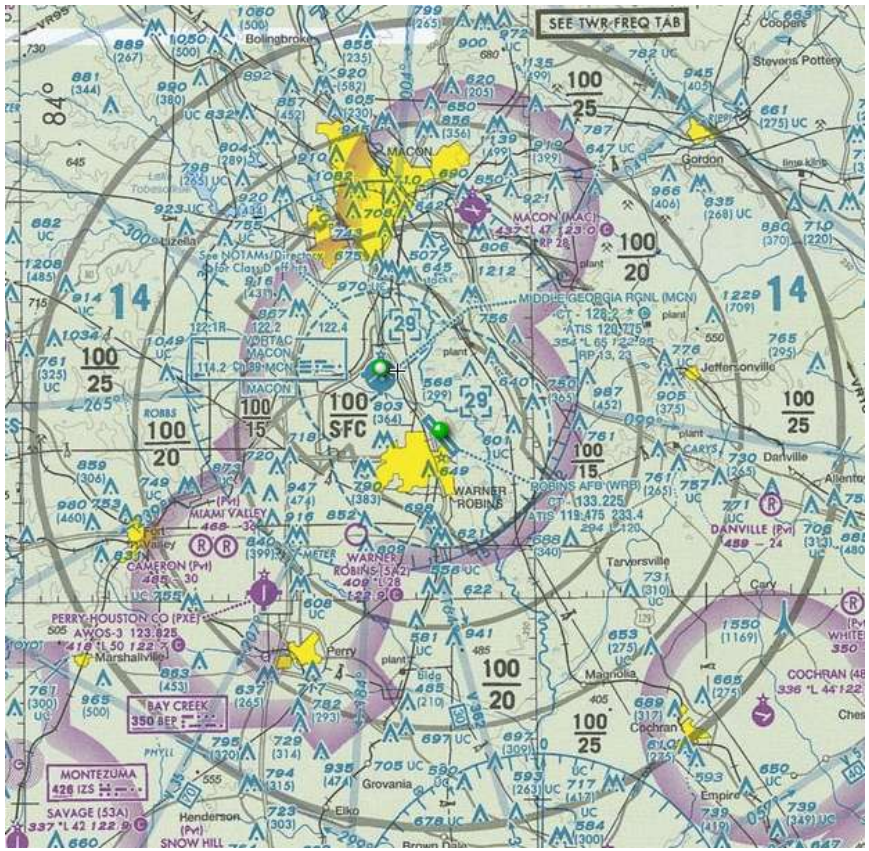
National Security Area (NSA)

- Consists of airspace of defined vertical and lateral dimensions established at locations where there is a requirement for increased security and safety of ground facilities.
- Pilots are requested to voluntarily avoid flying through the depicted NSA.



Terminal Radar Service Area (TRSA)

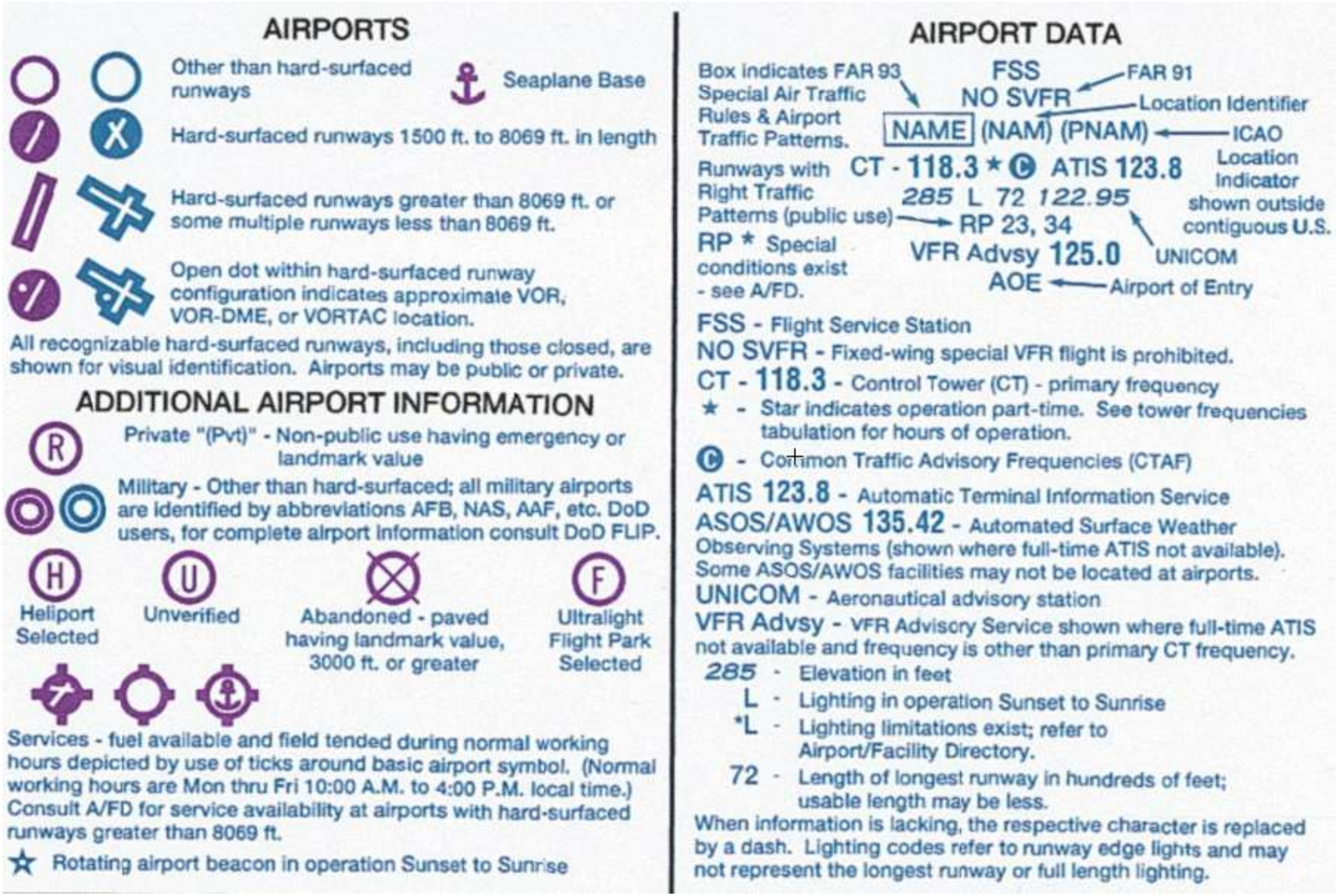
- Voluntary participation
- Participating pilots can receive radar services
- Goal is to provide separation from IFR and participating VFR traffic
- Not many exist



Macon TRSA

Airports

- Airport Legend on Charts:



Non-Towered

- Two-way radio contact not required
- Pilots encouraged to transmit intentions on local frequency, the Common Traffic Advisory Frequency (CTAF)
- UNICOM – non-government air/ground station which may transmit information at non-towered airports at pilot request
- Magenta colored on map

Example:

Laconia Municipal, identifier LCI

Automated Weather Observing Station (AWOS) information available on frequency 133.52

Airport Elevation: 545 ft MSL

*L: Lighting limitations exist, see A/FD

Longest Runway: 5,900 ft

CTAF frequency: 123.0

Towered

- ATC required to provide safe, orderly flow of air traffic
- Busier airports
- Pilots required to maintain two-way contact with ATC
- Blue colored on map

Example:

Lebanon Field, identifier LEB

Control Tower frequency is 125.95, which is also the CTAF when tower closed

* indicates control tower operates part time

Automatic Terminal Information Service (ATIS) available on frequency 118.65

Airport Elevation: 603 ft MSL

*L: Lighting limitations exist, see A/FD

Longest Runway: 5,500 ft

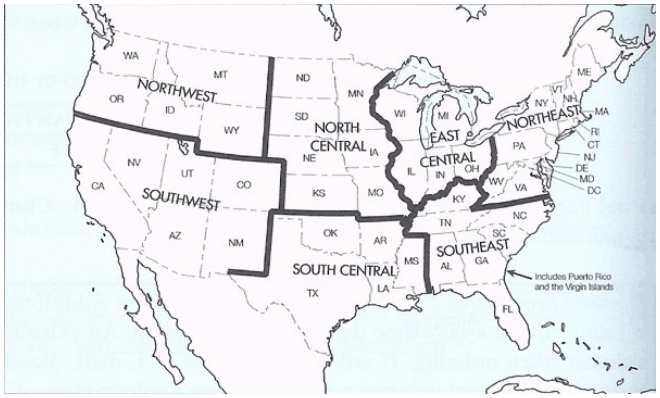
UNICOM advisory frequency available on 122.95

Sources of Airport Info

- Aeronautical Charts
- Chart Supplement - Airport/Facility Directory (A/FD)
- Notices to Airmen (NOTAM)
- Internet

Chart Supplements

- Most comprehensive information
- Published in 7 books, organized by region
- Updated every 56 days
- In print, or online at www.naco.faa.gov



The 7 A/FD books

Laconia, NH (LCI) Entry in the Northeast A/FD

LACONIA MUNI (LCI) 3 NE UTC−5(−4DT) N43°34.38′ W71°25.07′ — NEW YORK

545 B S4 **FUEL** 100LL, JET A NOTAM FILE LCI — H–11D, 12K, L–32H IAP

RWY 08–26: H5890X100 (ASPH–GRVD) S–60 HIRL 0.5% up W

RWY 08: MALSR. VASI(V4L)—GA 3.0° TCH 40′. Trees.

RWY 26: REIL. PAPI (P4R)—GA 4.0° TCH 55′. Thld dsplcd 244′. Tree.

RUNWAY DECLARED DISTANCE INFORMATION

RWY 08: TORA–5890 TODA–5890 ASDA–5646 LDA–5646

RWY 26: TORA–5890 TODA–5890 ASDA–5530 LDA–5286

AIRPORT REMARKS: Attended May–Oct 1200–0000Z‡, Nov–Apr 1300–2300Z‡. 100LL avbl 24 hrs with credit card system. Wildlife on and invof arpt. Rwy 26 PAPI unusable byd 6° left of centerline. ACTIVATE HIRL Rwy 08–26, MALSR Rwy 08, VASI Rwy 08, PAPI Rwy 26 and REIL Rwy 26—CTAF.

WEATHER DATA SOURCES: AWOS–3 133.525 (603) 524–5134.

COMMUNICATIONS: CTAF/UNICOM 123.0

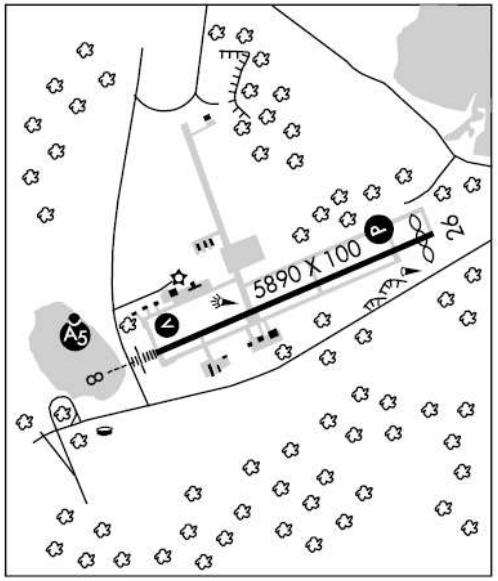
Ⓡ **BOSTON APP/DEP CON** 134.75 **CLNC DEL** 119.85

RADIO AIDS TO NAVIGATION: NOTAM FILE CON.

CONCORD (L) VORTACW 112.9 CON Chan 76 N43°13.19′ W71°34.53′ 033° 22.3 NM to fld. 715/15W. **HIWAS**

BLNAP NDB (MHW/LOM) 328 LC N43°32.20′ W71°32.22′ 083° 5.6 NM to fld.

ILS/DME 108.5 I–LCI Chan 22 Rwy 08. Class IB. LOM BLNAP NDB. DME unusable byd 30° rgt of course.



Notices to Air Missions (NOTAMs)

- Provide time critical updates Information regarding airports, airspace
- Types
  - NOTAM-L (minor alerts, e.g. bird activity)
  - NOTAM-D (affecting airport ops, e.g. runway closures)
  - FDC NOTAM (regulatory info, e.g. TFRs, approach changes)
- Published, internet, phone, local frequency
  - http://www.faa.gov/air_traffic/publications/notices/
  - Call 1-800-WX-BRIEF
- Example of NOTAM for special traffic procedures around the NASCAR Daytona 500 race:

  http://www.faa.gov/air_traffic/publications/notices/2010-02-11/SP10002.cfm

Runway Markings

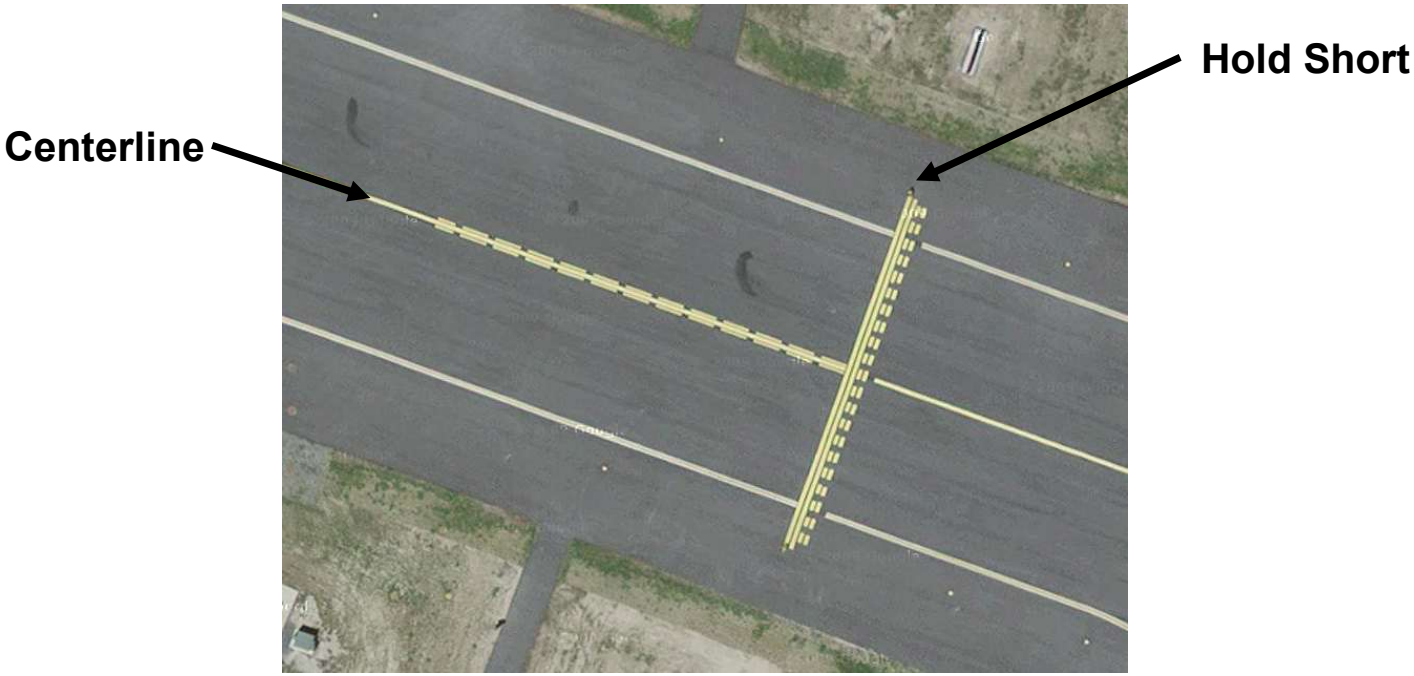
- Runway Number
  - Runway number represents heading of runway without last digit
  - Runways laid out in direction of prevailing winds
  - i.e., Runway 19 is approximately the magnetic heading 190
  - In the case of parallel runways, “L” (Left), “C” (Center), and “R” (Right) may be used to distinguish runways
- Displaced threshold
  - Usually to avoid obstacles at approach end of runway
  - Can still be used for takeoffs, roll-outs

Runways 9 and 4R at Logan

Displaced Threshold, Runway 20 at PDK

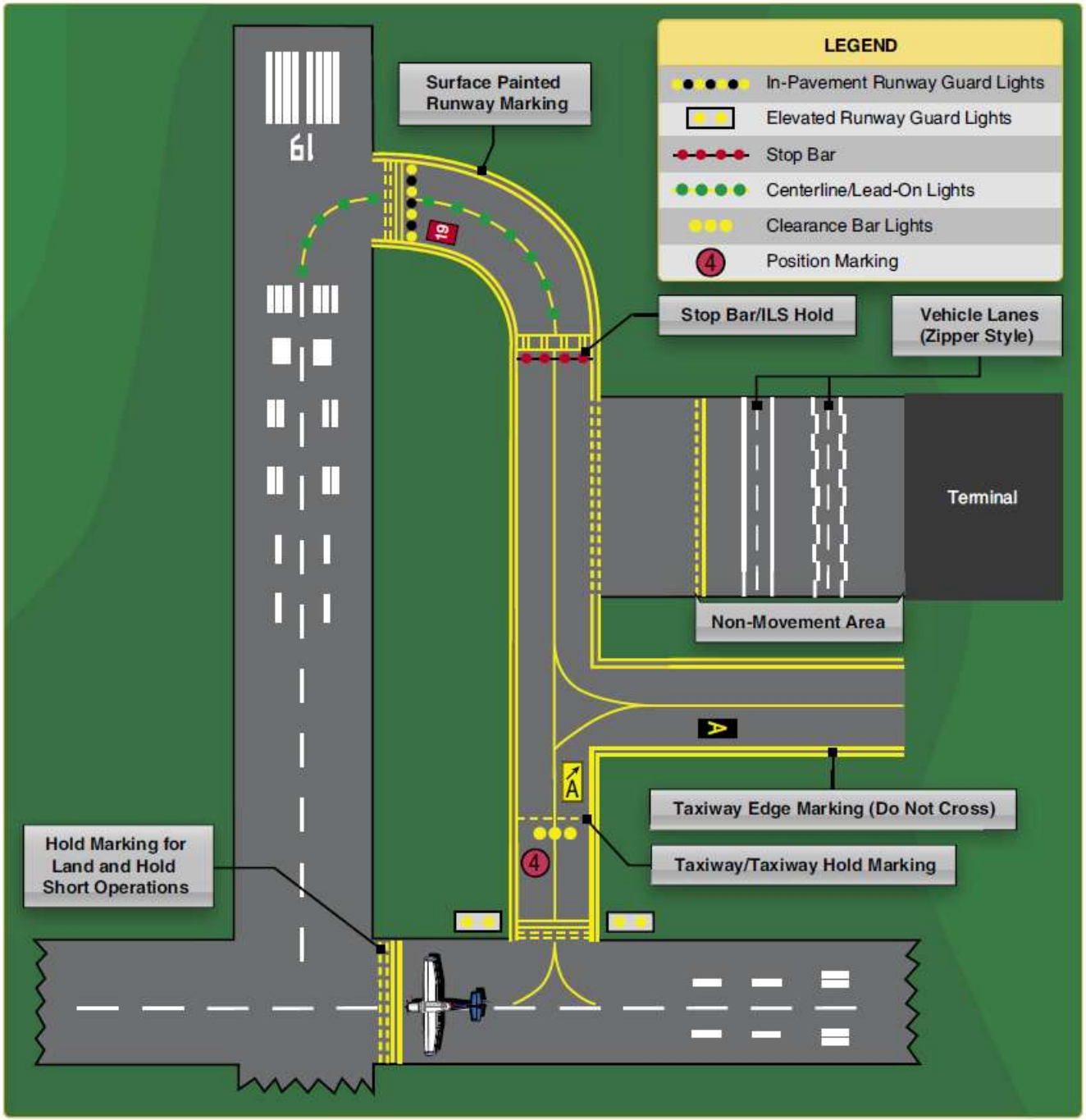
Taxiway Markings

- Continuous yellow line in center
- Edge markings
  - Solid: may not use paved shoulder
  - Dashed: may use paved shoulder
- Hold short (do not proceed until authorized): four lines

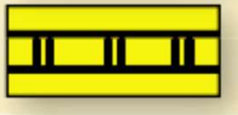


Taxiway at Logan

Airport Markings



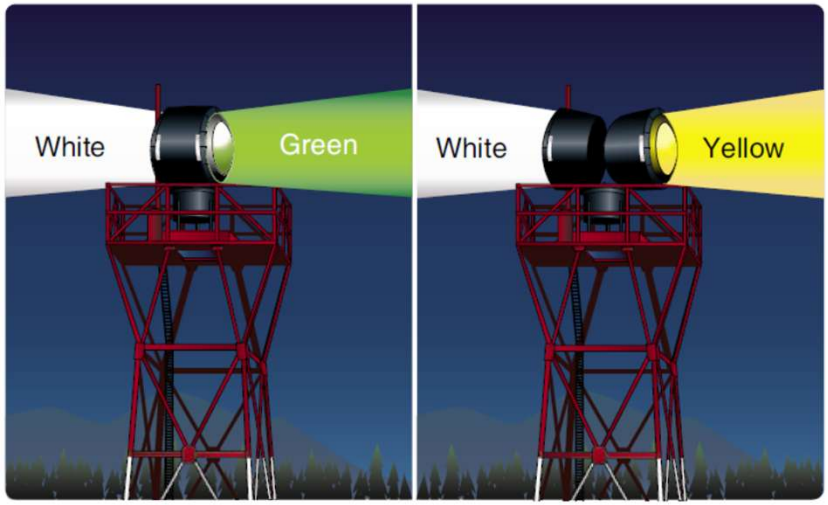
Airport Signage

Type of Sign	Action or Purpose	Type of Sign	Action or Purpose
	**Taxiway/Runway Hold Position:** Hold short of runway on taxiway		**Runway Safety Area/Obstacle Free Zone Boundary:** Exit boundary of runway protected areas
	**Runway/Runway Hold Position:** Hold short of intersecting runway		**ILS Critical Area Boundary:** Exit boundary of ILS critical area
	**Runway Approach Hold Pos** Hold short of aircraft on appro		
	**ILS Critical Area Hold Positi** Hold short of ILS approach cri		
	**No Entry:** Identifies paved areas where a prohibited		
	**Taxiway Location:** Identifies taxiway on which aircraft is located		**Inbound Destination:** Defines directions for arriving aircraft
	**Runway Location:** Identifies runway on which aircraft is located		**Taxiway Ending Marker:** Indicates taxiway does not continue
	**Runway Distance Remaining:** Provides remaining runway length in 1,000 feet increments		**Direction Sign Array:** Identifies location in conjunction with multiple intersecting taxiways

ILS Critical Area is protected by the tower when ceiling ≤ 800’ AGL and/or visibility ≤ 2SM and there is an aircraft past FAF.
At non-towered fields, it is recommended to observe the same weather parameters until released for departure.

Airport Beacons

- Help identify airport at night
- Operational dusk-dawn, sometimes in poor visibility
- Pattern (rotating beacon)
  - Civilian airports: white and green
  - Water airport: white and yellow
  - Heliport: white, yellow, and green
  - Military: white, white, and green



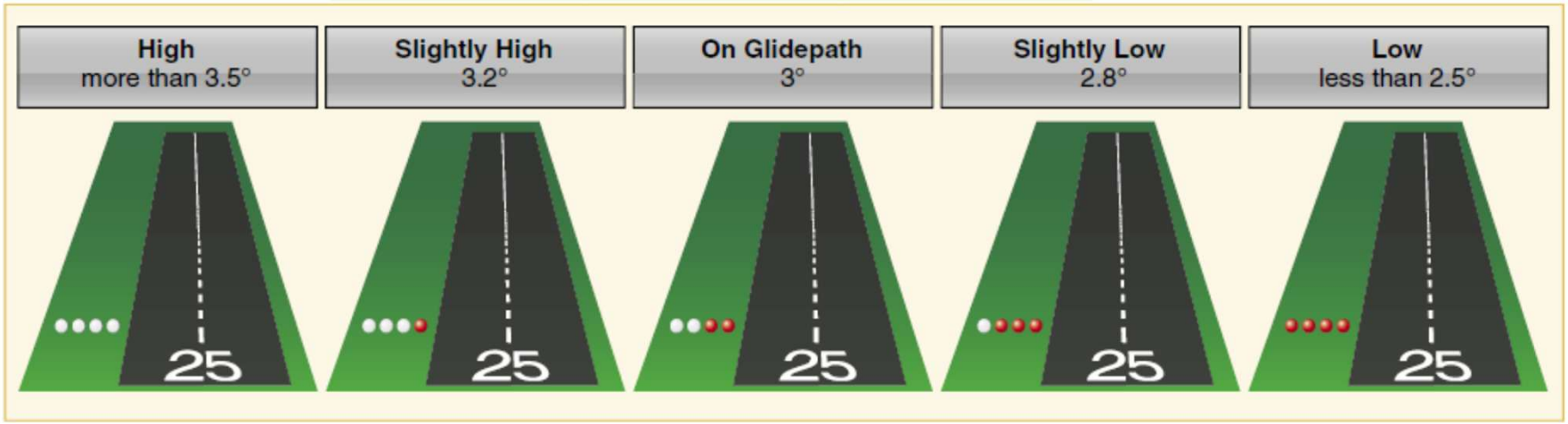
Rotating Beacons

Approach Lights

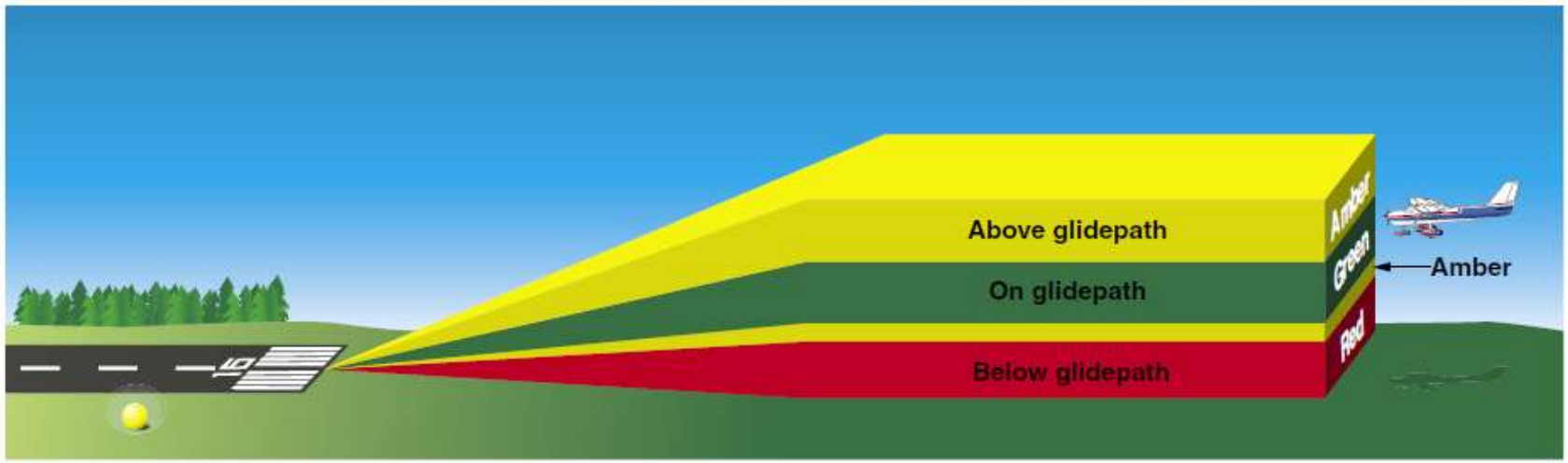
- Visual Approach Slope Indicator (VASI)
  - Two rows of lights
  - White/red color of lights indicates deviation from path
  - usually 3 degrees slope
- Precision Approach Path Indicator (PAPI)
  - Similar to VASI, but in single row
- Tri-color

VASI

PAPI



Tri-Color



Runway Lighting

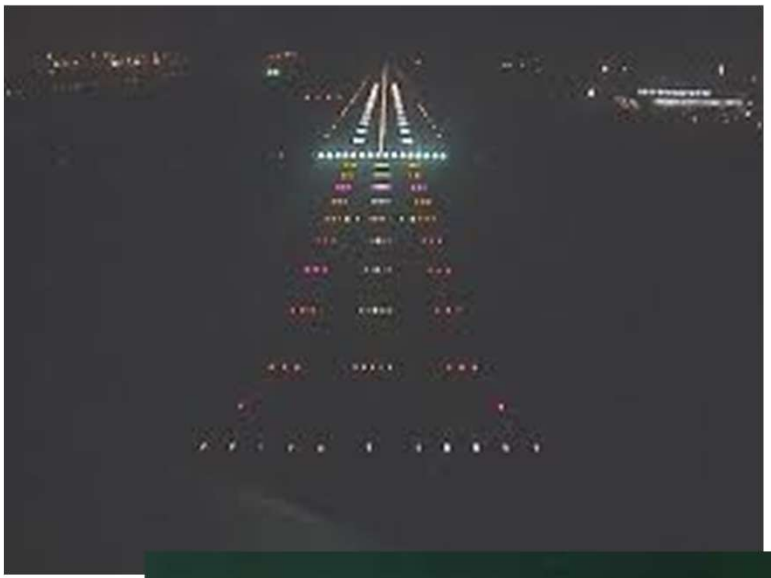
- Runway End Identifier Lights (REILs)
- Runway Edge Lights (white)
  - HIRL (High Intensity Runway Lights)
  - MIRL (Medium Intensity Runway Lights)
  - LIRL (Low Intensity Runway Lights)
- In-Runway Lights

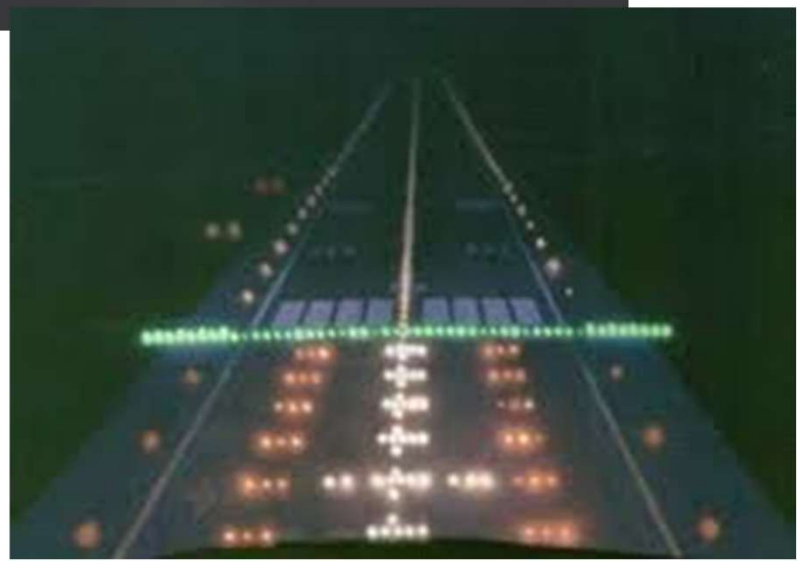
Control of Airport Lighting

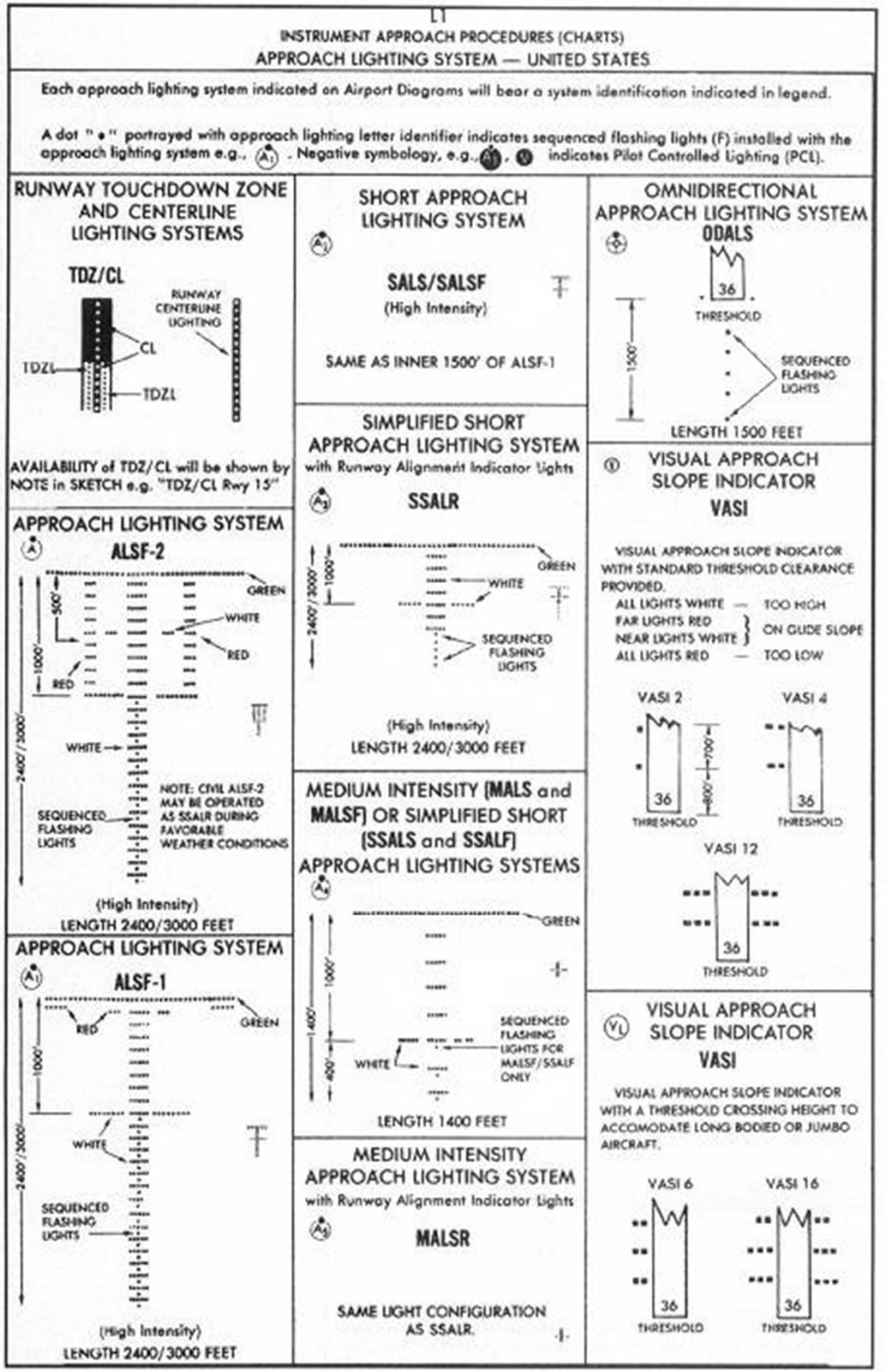
- At some non-towered airports, pilots can control lighting via radio (see A/FD)
- Controlled by “keying” or clicking the mic
  - 7 times within 5 sec – highest intensity
  - 5 times within 5 sec – medium intensity
  - 3 times within 5 sec – lowest intensity

Approach Lights (IFR)

- Always a beautiful sight after a long IFR flight!



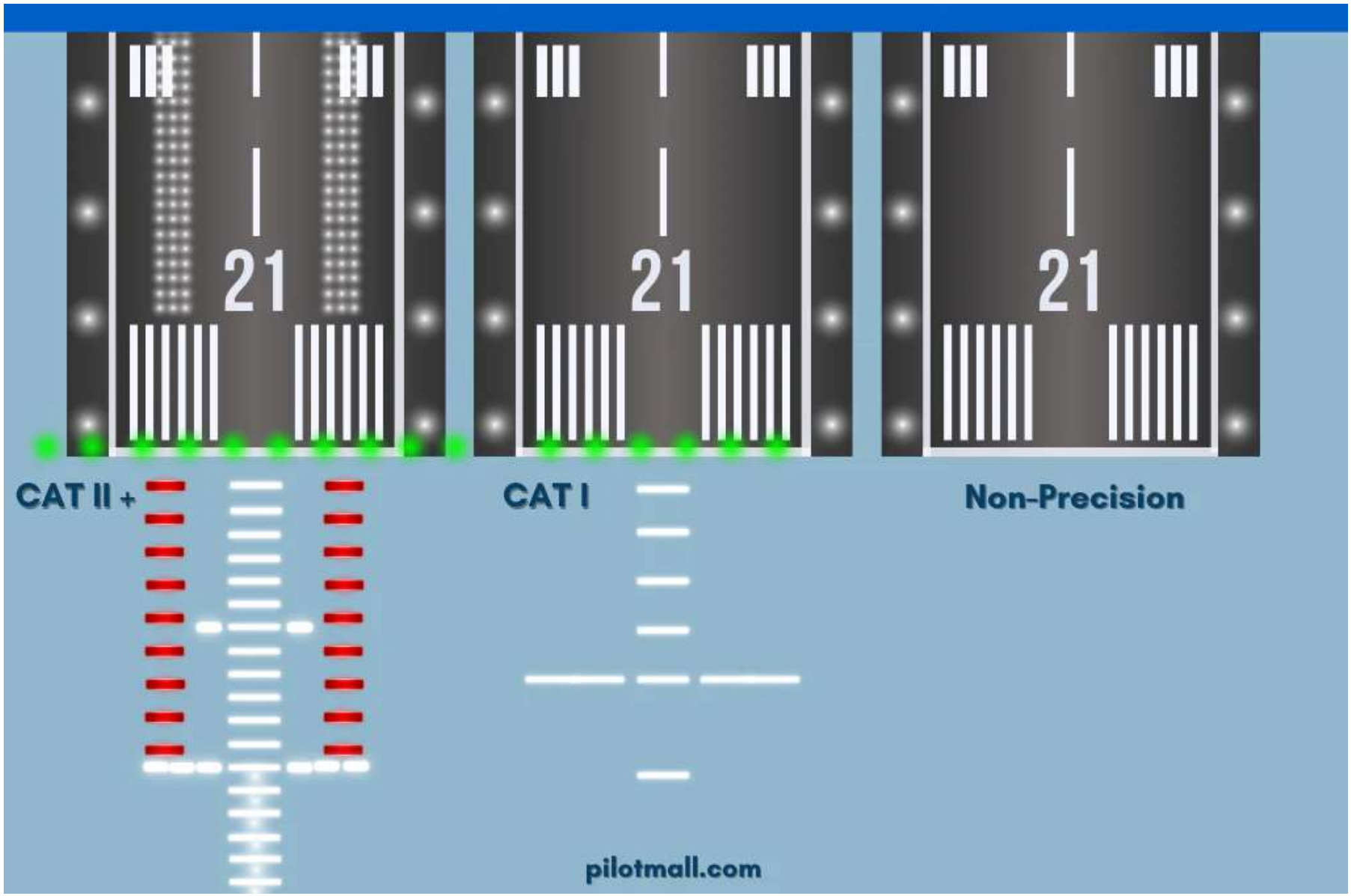




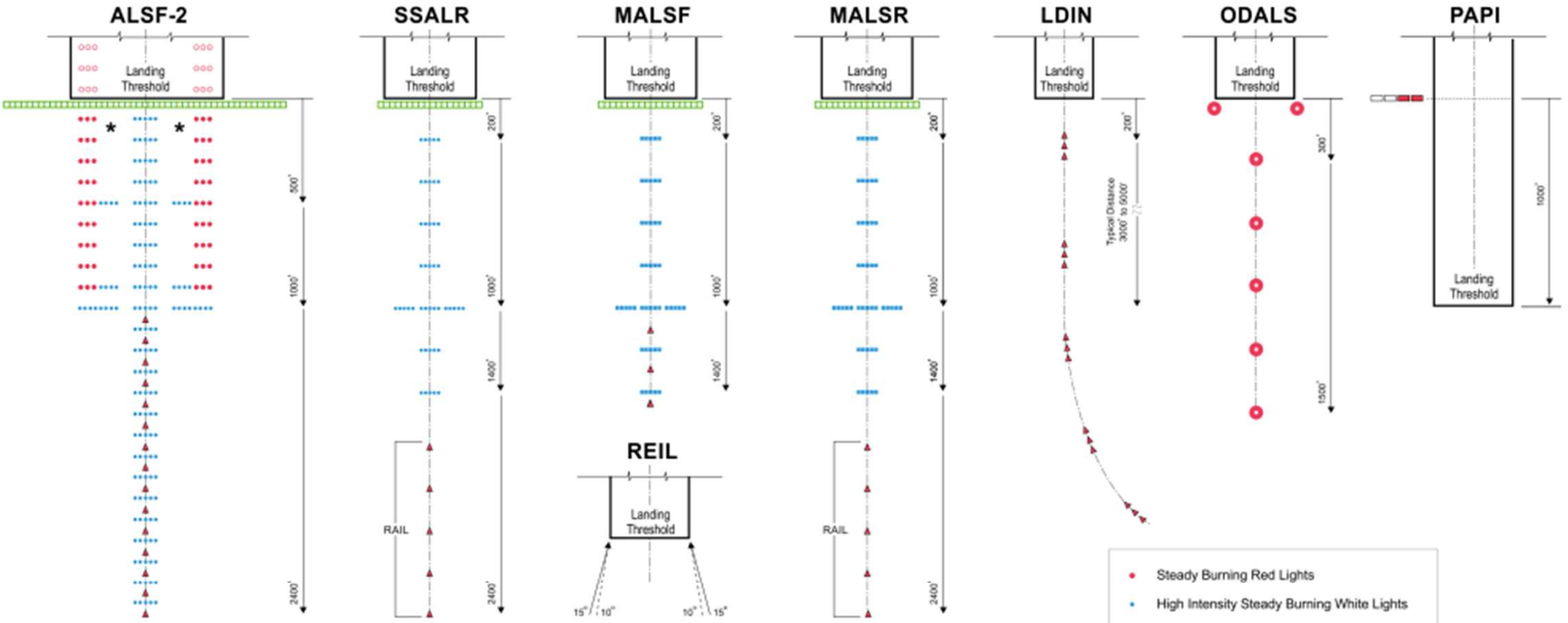
Approach Lights (IFR)

Symbol and color letters	Description
G R	Runway threshold / End lights Green (G) / Red (R)
Y W	Runway edge light (see note 3) Yellow (Y) / White (W)
W	Runway edge light White (W)
W	Runway edge light (in-pavement) White (W)
R	Runway threshold / End light Red (R)
B	Taxiway edge light Blue (B)
Y R	Runway edge light at displaced threshold Yellow (Y) / Red (R)
G Y	Threshold / Runway edge lights at displaced threshold Green (G) / Yellow (Y)
G UNI	Runway threshold light with a unidirectional green (G UNI)

Approach Lights (IFR)



Approach Lights (IFR)



ALSF-2 High Intensity Approach Lighting System with Sequenced Flashing Lights (CAT II Standard)

SSALR Simplified Short Approach Lighting System with Runway Alignment Indicator Lights

MALSF Medium Intensity Approach Lighting System with Sequenced Flashing Lights

MALSR Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (CAT I Standard)

PAPI Precision Approach Path Indicator Lights

LDIN Lead-In Lights

REIL Runway End Identifier Lights

RAIL Runway Alignment Indicator Lights

ODALS Omnidirectional Approach Lighting System

Approach Lights (IFR)

Washington DC SFRA