



**Federal Aviation  
Administration**

**Aeronautical Information Services**

# **Aeronautical Chart Users' Guide**

**Effective as of 12 June 2025**



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# INTRODUCTION

This Chart Users' Guide is an introduction to the Federal Aviation Administration's (FAA) aeronautical charts and publications. It is useful to new pilots as a learning aid, and to experienced pilots as a quick reference guide.

The FAA is the source for all data and information utilized in the publishing of aeronautical charts through authorized publishers for each stage of Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) air navigation including training, planning, departures, enroute (for low and high altitudes), approaches, and taxiing charts. Digital charts are available online at:

- [VFR Charts](#)
- [IFR Charts](#)
- [Terminal Procedures Publication](#)
- [Chart Supplements](#)

Paper copies of the charts are available through an FAA Approved Print Provider. A complete list of current providers is available at [http://www.faa.gov/air\\_traffic/flight\\_info/aeronav/print\\_providers/](http://www.faa.gov/air_traffic/flight_info/aeronav/print_providers/).

The FAA Aeronautical Information Manual (AIM) Pilot/Controller Glossary defines all terms and abbreviations used throughout this publication. Unless otherwise indicated, miles are nautical miles (NM), altitudes indicate feet above Mean Sea Level (MSL), and times used are Coordinated Universal Time (UTC).

Notices to Airmen (NOTAMs) alert pilots to time-critical aeronautical information that is either temporary or not sufficiently known in advance to permit publication on aeronautical charts or in other operational publications. Pilots can access NOTAM information via Flight Service Stations (FSS) or online via NOTAM Search at <https://notams.aim.faa.gov/notam-Search/>.

In addition to NOTAMs, the Safety Alerts/Charting Notices page of the Aeronautical Information Services website is also useful to pilots.

## KEEP YOUR CHARTS CURRENT

Aeronautical information changes rapidly, so it is important that pilots check the effective dates on each aeronautical chart and publication. To avoid danger, it is important to always use current editions and discard obsolete charts and publications.

To confirm that a chart or publication is current, refer to the next scheduled edition date printed on the cover. Pilots should also check NOTAMs for important updates between chart and publication cycles that are essential for safe flight.

## EFFECTIVE DATE OF CHART USERS' GUIDE AND UPDATES

All information in this guide is effective as of **12 June 2025**. All graphics used in this guide are for educational purposes. Chart symbology may not be to scale. Please do not use them for flight navigation.

## COLOR VARIATION

Although the digital files are compiled in accordance with charting specifications, the final product may vary slightly in appearance due to differences in printing techniques/processes and/or digital display techniques.

## REPORTING CHART DISCREPANCIES

Your experience as a pilot is valuable and your feedback is important. We make every effort to display accurate information on all FAA charts and publications, so we appreciate your input. Please notify us concerning any requests for changes, or potential discrepancies you see while using our charts and related products.

FAA, Aeronautical Information Services  
1305 East-West Highway  
SSMC4, Room 3424  
Silver Spring, MD 20910-3281

Telephone Toll-Free 1-800-638-8972  
Aeronautical Inquiries: [https://www.faa.gov/air\\_traffic/flight\\_info/aeronav/aero\\_data/Aeronautical\\_Inquiries/](https://www.faa.gov/air_traffic/flight_info/aeronav/aero_data/Aeronautical_Inquiries/)



# WHAT'S NEW?

Update as of 12 June 2025

The following charting items have been added to the Chart Users' Guide since the Guide was last published on 17 April 2025:

## VFR CHARTS

No Significant Changes Applied

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## IFR ENROUTE CHARTS

No Significant Changes Applied

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## TERMINAL PROCEDURE PUBLICATION (TPP)

Taxiways on Airport Sketches:

Starting with the June 12, 2025 publication date, the grayscale taxiway data will be removed from instrument approach procedure (IAP) airport sketches at airports that have an associated airport diagram.

See the [25-02 TERM Charting Notice](#) for additional information.

Circling Minima:

In 2012, there was a change to the TERPS criteria that affected the circling area dimension by expanding the areas to provide improved obstacle protection. To indicate that the new criteria had been applied to a given procedure, a  was placed on the circling line of minimums. All circling areas have now been evaluated for the circling MDA protected area radius as shown in the table in the TPP Legend. Users may ignore the presence of the  symbol on charts, and it will be removed on a day-forward basis. See the [25-05 TERM Charting Notice](#) for additional information.

Obstacles:

Starting with the June 12, 2025 publication date, the following obstacle information on Instrument Approach Procedures (IAPs) and Airport Diagrams (ADs) will be removed:

- 67:1 slope obstacles (from IAPs)
- Spot elevations and highest obstacles from IAPs and ADs

Obstacles that are specifically requested for charting by the procedure specialist will continue to be charted on IAPs. See the [25-04 TERM Charting Notice](#) for additional information.



# EXPLANATION OF VFR TERMS AND SYMBOLS

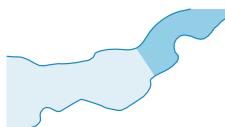
This chapter covers the Sectional Aeronautical Chart (Sectional). These charts include the most current data at a scale of (1:500,000), which is large enough to be read easily by pilots flying by sight under Visual Flight Rules. Sectionals are named after a major city within its area of coverage.

The chart legend includes aeronautical symbols and information about drainage, terrain, the contour of the land, and elevation. You can learn to identify aeronautical, topographical, and obstruction symbols (such as radio and television towers) by using the legend.

A brief description next to a small black square indicates the exact location for many of the landmarks easily recognized from the air, such as stadiums, pumping stations, refineries, etc. A small black open circle with descriptive type indicates oil, gas or mineral wells. A small black circle with descriptive type indicates water, oil or gas tanks. The scale for some items may be increased to make them easier to read on the chart.

Aeronautical Information Services' charts are prepared in accordance with specifications of the Interagency Air Committee (IAC) and are approved by representatives of the Federal Aviation Administration (FAA) and the Department of Defense (DoD).

## WATER FEATURES (HYDROGRAPHY)

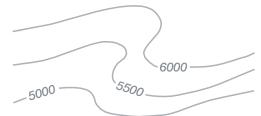


Water features are depicted using two tones of blue, and are considered either "Open Water" or "Inland Water." "Open Water," a lighter blue tone, shows the shoreline limitations of all coastal water features at the average (mean) high water levels for oceans and seas. Light blue also represents the connecting waters like bays, gulfs, sounds and large estuaries.

Exceptionally large lakes like the Great Lakes, Great Salt Lake, and Lake Okeechobee, etc., are considered Open Water features. The Open Water tone extends inland as far as necessary to adjoin the darker blue "Inland Water" tones. All other bodies of water are marked as "Inland Water" in the darker blue tone.

## LAND FEATURES (TERRAIN) AND OBSTRUCTIONS

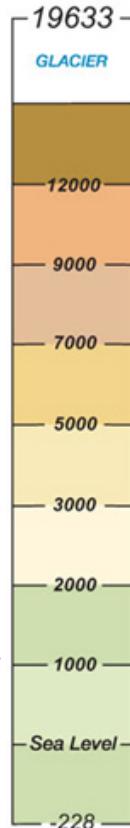
The elevation and configuration of the Earth's surface is important to pilots. Our Aeronautical Information Specialists are devoted to showing the contour of the earth and any obstructions clearly and accurately on our charts. We use five different techniques: contour lines, shaded relief, color tints, obstruction symbols, and Maximum Elevation Figures (MEF).

1. Contour lines join points of equal elevation. On Sectionals, basic contours are spaced at 500' intervals. Intermediate contours are typically at 250' intervals in moderately level or gently rolling areas. Auxiliary contours at 50', 100', 125', or 150' intervals occasionally show smaller relief features in areas of relatively low relief. The pattern of these lines and their spacing gives the pilot a visual concept of the terrain. Widely spaced contours represent gentle slopes, while closely spaced contours represent steep slopes.A diagram showing three contour lines labeled 5000, 5500, and 6000, representing elevations in feet. The lines are curved and spaced apart, illustrating a gentle slope.
2. Shaded relief shows how terrain may appear from the air. Shadows are shown as if light is coming from the northwest, because studies have shown that our visual perception has been conditioned to this view.A diagram showing a shaded relief terrain surface, appearing as a series of hills and valleys with varying shades of gray to represent elevation changes.

- Different color tints show bands of elevation relative to sea level. These colors range from light green for the lower elevations, to dark brown for the higher elevations.
- Obstruction symbols show man made vertical features that could affect safe navigation. The FAA maintains a database of obstacles. Aeronautical Specialists evaluate each obstacle based on charting specifications before adding it to a visual chart. When a Specialist is not able to verify the position or elevation of an obstacle, it is marked UC, meaning it is "under construction" or being reported, but has not been verified.

The FAA uses a Digital Obstacle File (DOF) to collect and disseminate data. Because land and obstructions frequently change, the source data on obstructions and terrain is occasionally incomplete or not accurate enough for use in aeronautical publications. For example, when the FAA receives notification about an obstruction, and there is insufficient detail to determine its position and elevation, the FAA Flight Edit Program conducts an investigation.

The Flight Edit crew visually verifies the cultural, topographic, and obstacle data. Charts are generally flight-checked every four years. This review includes checking for any obstruction that has been recently built, altered, or dismantled without proper notification.



- Obstacles less than 1000' AGL.** Sectional Charts and Terminal Area (TACs) typically show man-made obstacles extending more than 200' Above Ground Level (AGL), or more than 299' AGL in yellow city tint. Obstacles may be lit or unlit. Features considered to be hazardous obstacles to low-level flight are; smokestacks, tanks, factories, lookout towers, antennas, and wind turbines, etc.
- Obstacles 1000' AGL or greater.** **Wind Turbines.** Man-made features used by FAA Air Traffic Control as checkpoints use a graphic symbol shown in black with the required elevation data in blue. The elevation of the top of the obstacle above Mean Sea Level (MSL) and the height of the structure (AGL) is also indicated (when known or can be reliably determined by a Specialist). The AGL height is in parentheses below the MSL elevation. In extremely congested areas, the FAA typically omits the AGL values to avoid confusion.
- GARFIELD STACK** **5540 (650)** Whenever possible, the FAA depicts specific obstacles on charts. However, in high-density areas like city complexes, only the highest obstacle is represented on the chart using the group obstacle symbol to maximize legibility.
- If space is available the AGL height of the obstruction is shown in parentheses.** **5000 (1500) UC** Obstacles under construction are indicated by placing the letters UC adjacent to the obstacle type.
- Guy wires may extend outward from obstacles.** **Wind turbines with high intensity lighting.** Obstacles with high-intensity strobe lighting systems may operate part-time or by proximity activation and are shown as follows:
- 2894 UC** Concentrated obstructions of wind turbine farms shall be portrayed by an overlying hatched area and dotted outline to represent the approximate parameters of the farm. One or more single turbine symbols will populate the farm. A boxed elevation figure representing the MSL elevation of the highest wind turbine within the area shall be placed inside the farm or, if space is limited, just outside. Pilots are reminded that wind turbine blades and/or blade tips are not lighted. Wind turbine obstruction lights are located on top of the nacelle (generator) at the hub of wind turbines, which in some cases can be 200-300' below the rotating blade tips.

In this example the  
MEF represents  
12,500'.

5. The Maximum Elevation Figure (MEF) represents the highest elevation within a quadrant, including terrain and other vertical obstacles (towers, trees, etc.). A quadrant on Sectionals is the area bounded by ticked lines dividing each 30 minutes of latitude and each 30 minutes of longitude. MEF figures are rounded up to the nearest 100' value and the last two digits of the number are not shown.

MEFs over land and open water areas are used in areas containing man-made obstacles such as oil rigs.

In the determination of MEFs, the FAA uses extreme care to calculate the values based on the existing elevation data shown on source material. Aeronautical Information Specialists use the following procedure to calculate MEFs:

### MEF - Man-made Obstacle

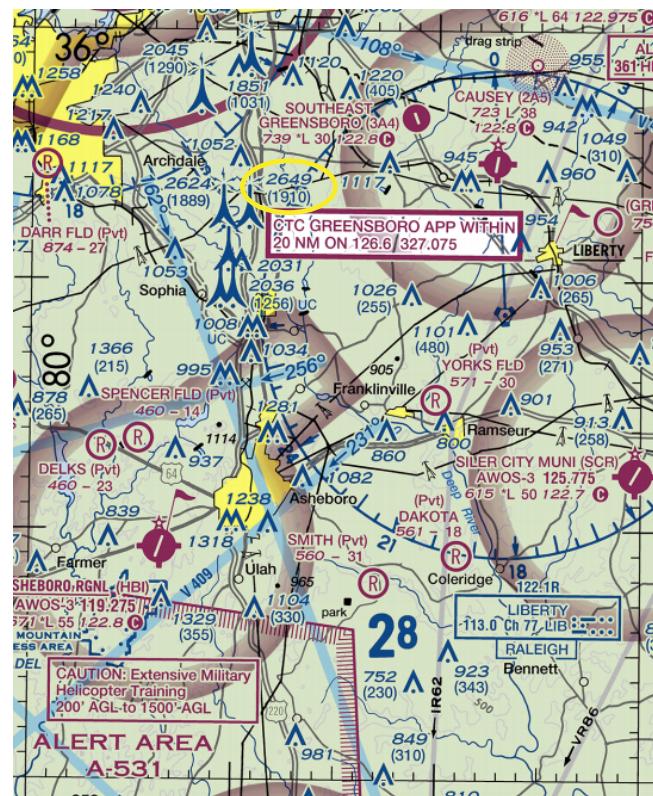
When a man-made obstacle is more than 200' above the highest terrain within the quadrant:

1. Determine the elevation of the top of the obstacle above MSL.
2. Add the possible vertical error of the source material to the above figure (100' or 1/2 contour interval when interval on source exceeds 200'. U.S. Geological Survey Quadrangle Maps with contour intervals as small as 10' are normally used).
3. Round the resultant figure up to the next higher hundred-foot level.

#### Example:

Elevation of obstacle top (MSL)	2649
Possible obstacle error	+100
equals	2749
Raise to the following 100' level	2800
Maximum Elevation Figure (MEF)	28

28



## MEF - Natural Terrain Feature or Natural Vertical Obstacle

When a natural terrain feature or natural vertical obstacle (e.g. a tree) is the highest feature within the quadrangle:

1. Determine the elevation of the feature.
2. Add the possible vertical error of the source to the above figure (100' or 1/2 the contour interval when interval on source exceeds 200').
3. Add a 200' allowance for uncharted natural or manmade obstacles. Chart specifications don't require the portrayal of obstacles below minimum height.
4. Round the figure up to the next higher hundred-foot level.

### Example:

Elevation of obstacle top (MSL) 13161

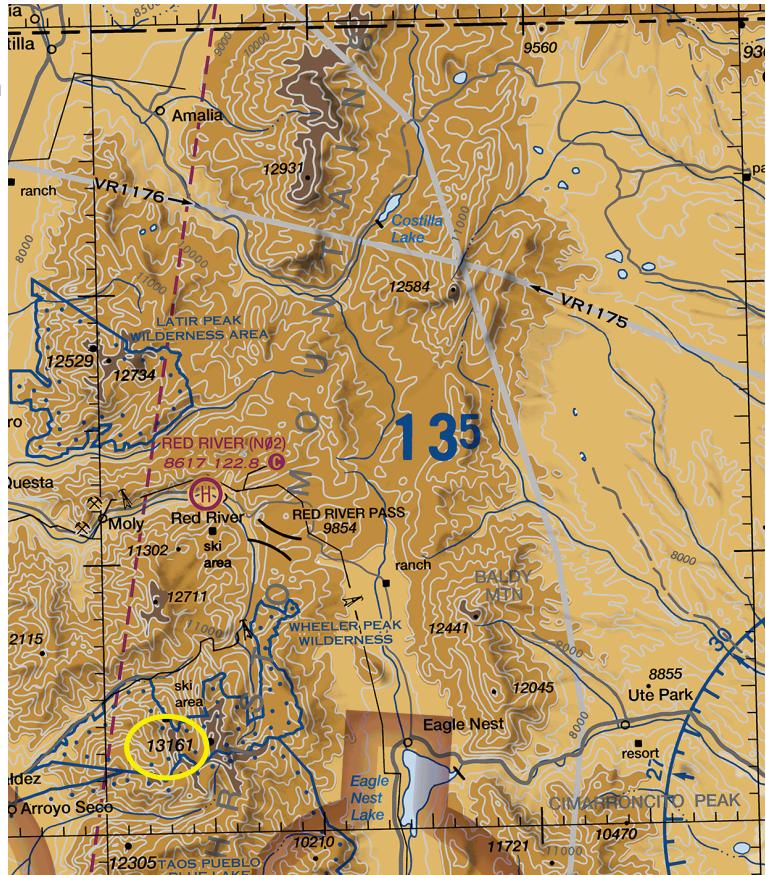
Possible vertical error +100

Obstacle Allowance +200

equals 13461

Raise to the following 100' level 13500

Maximum Elevation Figure (MEF) **135**

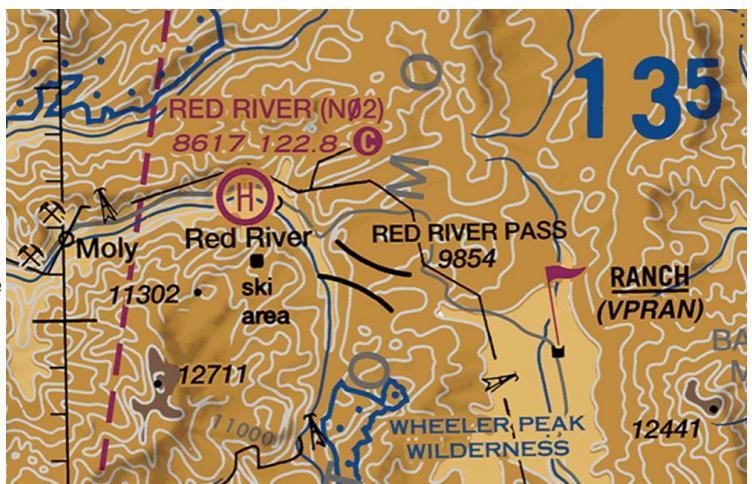


FAA Chart Users' Guide - VFR Terms and Symbols

Pilots should be aware that while the MEF is based on the best information available to the Specialist, the figures are not verified by field surveys. Also, users should consult the Aeronautical Information Services website to ensure that your chart has the latest MEF data available.

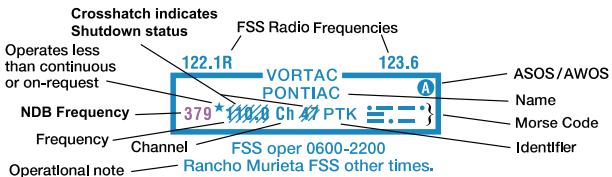
## LAND FEATURES - MOUNTAIN PASSES

The Mountain Pass symbol does not indicate a recommended route or direction of flight, and pass elevation does not indicate a recommended clearance altitude. Hazardous flight conditions may exist within and near mountain passes. For high-traffic mountain passes, VFR Checkpoints may be provided to increase situational awareness by indicating key landmarks inside confined terrain. A collocated VFR Waypoint and Checkpoint may be provided to assist with identifying natural entry points for commonly flown mountain passes.



## RADIO AIDS TO NAVIGATION

On VFR Charts, information about radio aids to navigation (NAVAID) are boxed, as illustrated. Duplication of data is avoided. When two or more radio aids in a general area have the same name with different frequencies, Tactical Air Navigation (TACAN) channel numbers, or identification letters, and no misinterpretation can result, the name of the radio aid may be indicated only once within the identification box. Very High Frequency/Ultra High Frequency (VHF/UHF) NAVAID names and identification boxes (shown in blue) take precedence. Only those items that differ (e.g., frequency, Morse Code) are repeated in the box in the appropriate color. The choice of separate or combined boxes is made in each case on the basis of economy of space and clear identification of the radio aids.



A NAVAID that is physically located on an airport may not always be represented as a typical NAVAID symbol. A small open circle indicates the NAVAID location when collocated with an airport icon.

The type of NAVAID will be identified by: "VOR," (VHF Omni-Directional Range) "VORTAC" (VOR Tactical Aircraft Control), "VOR-DME," (VOR-Distance Measuring Equipment) or "DME" (Distance Measuring Equipment) positioned on and breaking the top line of the NAVAID box.

DMEs are shown without the compass rose.

## AIRPORTS

Airports in the following categories are charted as indicated (additional symbols are shown later in this Section). Public use airports:

- Hard-surfaced runways greater than 8069' or some multiple runways less than 8069'
- Hard-surfaced runways 1500' to 8069'
- Other than hard-surfaced runways
- Seaplane bases

Military airports:

- Other than hard-surfaced runways

Foreign airports:

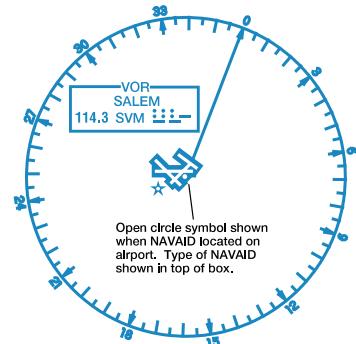


Hard-surfaced runways are depicted the same as public-use airports.

U.S. military airports are identified by abbreviations such as AAF (Army Air Field), AFB (Air Force Base), MCAS (Marine Corps Air Station), NAS (Naval Air Station), NAV (Naval Air Facility), and NAAS (Naval Auxiliary Air Station).

Fuel Available:

- Fuel availability indicated by use of tick marks around the basic airport symbol. Consult Chart Supplement for details and availability.



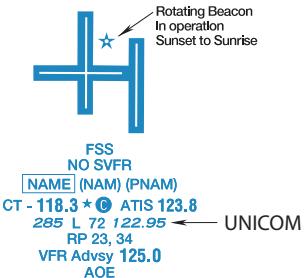
Other airports with or without fuel:



Airports are plotted in their true geographic position unless the symbol conflicts with a NAVAID at the same location. In such cases, the airport symbol will be displaced, but the relationship between the airport and the NAVAID will be retained. When a waypoint is collocated with a towered airport, the waypoint symbol will not be charted and the waypoint name followed by (WP) will be shown leadered to the waypoint true location. When depicting a seaplane base, the eye of the anchor symbol will be charted as close to the docking area as possible, with the remainder of the symbol in the water.

Airports are identified by their official FAA designated name.

The elevation of an airport is the highest point on the usable portion of the landing areas. Runway length is the length of the longest active runway, including displaced thresholds and excluding overruns. Runway length is shown to the nearest 100', using 70 as the rounding point; a runway 8070' in length is charted as 81, while a runway 8069' in length is charted as 80. If an airport has waterways, it will be indicated by a seaplane base symbol and additional elevation, lighting, and length information under primary airport information.



Flight Service Station on field	FSS	Elevation in feet	
Airports where fixed wing special VFR operations are prohibited (shown above airport name) FAR 91	NO SVFR	Lighting in operation Sunset to Sunrise	L
Indicates FAR 93 Special Air Traffic Rules and Airport Traffic Pattern		Lighting limitations exist; refer to Chart Supplement	*L
Location Identifier	(NAM)	Length of longest runway in hundreds of feet; usable length may be less	72
ICAO Location Identifier	(PNAM)	Aeronautical advisory station	122.95
Control Tower (CT) - primary frequency	CT - 118.3	Runways with Right Traffic Patterns (public use)	RP 23,34
Star indicates operation part-time. See tower frequencies tabulation for hours of operation	*	See Chart Supplement	*RP
Follows the Common Traffic Advisory Frequency (CTAF)	C	VFR Advisory Service Shown when ATIS is not available and frequency is other than the primary CT frequency	VFR Advsy 125.0
Automatic Terminal Information Services	ATIS 123.8	Weather Camera (Alaska)	WX CAM
Automatic Flight Information Service	AFIS 135.2	Airport of Entry	AOE
Automated Surface Weather Observing Systems; shown when full-time ATIS is not available	ASOS/AWOS 135.42	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.	

Airports with Control Towers (CT) and their related data are shown in blue. All other airports and their related data are shown in magenta. The L symbol indicates that runway lights are on from dusk to dawn. \*L indicates that the pilot must consult the Chart Supplement to determine runway lighting limitations, such as: available on request (by radio-call, letter, phone, etc), part-time lighting, or pilot/airport controlled lighting. Lighting codes refer to runway edge lights. The lighted runway may not be the longest runway available, and lights may not be illuminated along the full length of the runway. The Chart Supplement has a detailed description of airport and air navigation lighting aids for each airport. A dash represents no runway edge lights.

The symbol  indicates the existence of a rotating or flashing airport beacon operating from dusk to dawn. The Aeronautical Information Manual (AIM) thoroughly explains the types and uses of airport lighting aids.

Right traffic information is shown using the abbreviation 'RP' for right pattern, followed by the appropriate runway number(s) (RP 18). Special conditions or restrictions to the right pattern are indicated by the use of an asterisk (\*RP) to direct the pilot to the Chart Supplement for special instructions and/or restrictions.

The type "OBJECTIONABLE" associated with an airport symbol indicates that an objectionable airspace determination has been made for the airport per FAA JO 7400.2 Section 4, Airport Charting and Publication of Airport Data. Objectionable airspace determinations are based upon a number of factors including conflicting traffic patterns with another airport, hazardous runway conditions, or natural or man-made obstacles in close proximity to the landing area. FAA Regional Airports Offices are responsible for airspace determinations. Address any challenges to objectionable airspace determinations to your FAA Regional Airports Office.

## AIRSPACE

### CONTROLLED AIRSPACE

Controlled airspace consists of those areas where some or all aircraft may be subject to air traffic control, such as: Class A, Class B, Class C, Class D, Class E Surface (SFC) and Class E Airspace.

**Class A Airspace** within the United States extends from 18,000' up to FL600. While visual charts do not depict Class A, it is important to note its existence.

**Class B Airspace** is shown on the Sectional Aeronautical Chart (Sectional) and Terminal Area Chart (TAC). Class B MSL Altitudes   The MSL ceiling and floor altitudes of each sector are shown in solid blue figures with the last two zeros omitted. Floors extending "upward from above" a certain altitude are preceded by a (+). Operations at and below these altitudes are outside of Class B Airspace. Radials and arcs used to define Class B are prominently shown on TACs. Detailed rules and requirements associated with the particular Class B are shown. The name by which the Class B is shown as [LAS VEGAS CLASS B](#) for example.

**Class C Airspace** is shown on Sectionals and TACs. The MSL ceiling and floor altitudes of each sector are Class C MSL Altitudes   shown in solid magenta figures with the last two zeros eliminated.

  A ceiling value of "T" indicates the ceiling is to, but not including, the floor of the overlying Class B airspace.  
Surface.

Class C Airspace is identified by name: **BURBANK CLASS C**

Separate notes, enclosed in magenta boxes, give the approach control frequencies to be used by arriving VFR aircraft to establish two-way radio communication before entering the Class C (generally within 20 NM):

Class C operating less than continuous is indicated by the following note: See NOTAMs/Supplement for Class C eff hrs

CTC BURBANK APP WITHIN  
20 NM ON 124.6 395.9

**Class D Airspace** is identified with a blue dashed line. Class D operating less than continuous is indicated by the following note: See NOTAMs/Supplement for Class D eff hrs

Ceilings of Class D are shown as follows: **[30]**

A minus in front of the figure is used to indicate "from surface to, but not including..."

**Class E Surface (SFC) Airspace** is symbolized with a magenta dashed line. Class E (SFC) operating less than continuous is indicated by the following note: See NOTAMs/Supplement for Class E (sfc) eff hrs

**Class E Airspace** exists at 1200' AGL unless designated otherwise. The lateral and vertical limits of all Class E, (up to, but not including 18,000') are shown by narrow bands of vignette on Sectionals and TACs.

Controlled airspace floors of 700' above the ground are defined by a magenta vignette; floors other than 700' that laterally abut uncontrolled airspace (Class G) are defined by a blue vignette; differing floors greater than 700' above the ground are annotated by a symbol and a number indicating the floor.  

If the ceiling is less than 18,000' MSL, the value (preceded by the word "ceiling") is shown along the limits of the controlled airspace. These limits are shown with the same symbol indicated above.

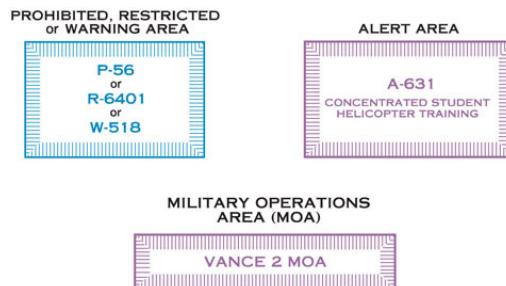
 CLASS G	Class E Airspace with floor 700 ft. above surface that laterally abuts Class G Airspace.
 CLASS E	Class E Airspace with floor 700 ft. above surface that laterally abuts 1200 ft. or higher Class E Airspace
 CLASS E	Class E Airspace with floor 1200 ft. or greater above surface that laterally abuts Class G Airspace

## UNCONTROLLED AIRSPACE

**Class G Airspace** within the United States extends up to 14,500' Mean Sea Level. At and above this altitude is Class E, excluding the airspace less than 1500' above the terrain and certain special use airspace areas.

## SPECIAL USE AIRSPACE

**Special Use Airspace (SUA)** confines certain flight activities and restricts entry, or cautions other aircraft operating within specific boundaries. Except for Controlled Firing Areas, SUA areas are depicted on VFR Charts. Controlled Firing Areas are not charted because their activities are suspended immediately when spotter aircraft, radar, or ground lookout positions indicate an aircraft might be approaching the area. Nonparticipating aircraft are not required to change their flight paths. SUA areas are shown in their entirety (within the limits of the chart), even when they overlap, adjoin, or when an area is designated within another area. The areas are identified by type and identifying name/number, and are positioned either within or immediately adjacent to the area.



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

## OTHER AIRSPACE AREAS

**Mode C Required Airspace** (from the surface to 10,000' MSL) within a 30 NM radius of the primary airport(s) for which a Class B is designated, is depicted by a solid magenta line.



Mode C is required, but not depicted for operations within and above all Class C up to 10,000' MSL.

Enroute Mode C requirements (at and above 10,000' MSL except in airspace at and below 2500' AGL) are not depicted. See FAR 91.215 and the AIM.

**FAR 93** Airports and heliports under Federal Aviation Regulation 93 (FAR 93), (Special Air Traffic Rules and Airport Traffic Patterns), are shown by "boxing" the airport name.



**FAR 91** Airports where fixed wing special visual flight rules operations are prohibited (FAR 91) are shown with the type "NO SVFR" above the airport name.

TRUCKEE - TAHOE

**National Security Areas** indicated with a broken magenta line  and Special Flight Rules Areas (SFRAs) indicated with the following symbol:  , consist of airspace with defined vertical and lateral dimensions established at locations where there is a requirement for increased security and safety of ground facilities. Pilots should avoid flying through these depicted areas. When necessary, flight may be temporarily prohibited.

**The Washington DC Flight Restricted Zone (FRZ)** is related to National Security. It is depicted using the Prohibited/Restricted/Warning Area symbology  and is located within the SRA. It is defined as the airspace within approximately a 13 to 15 NM radius of the DCA VOR-DME. Additional requirements are levied upon aviators requesting access to operate inside the National Capital Region.

**Temporary Flight Restriction (TFR) Areas Relating to National Security** are indicated with a broken blue line . A Temporary Flight Restriction (TFR) is a type of Notice to Airmen (NOTAM). A TFR defines an area where air travel is restricted due to a hazardous condition, a special event, or a general warning for the entire airspace. The text of the actual TFR contains the fine points of the restriction. It is important to note that only TFRs relating to National Security are charted.

**Air Defense Identification Zones (ADIZs)** are symbolized using the ADIZ symbol: . As defined in Code of Federal Regulations 14 (CFR 14) Part 99, an ADIZ is an area in which the ready identification, location, and control of all aircraft is required in the interest of national security. ADIZ boundaries include Alaska, Hawaii, Guam and the Contiguous U.S.

**National Defense Airspace Temporary Flight Restriction (TFR) Areas** are bounded with cross hatching: . These areas include airspace that is subject to routine TFRs published as NOTAMs that have a 12+ month duration.

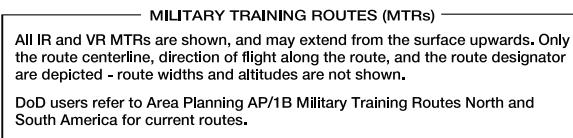
**Terminal Radar Service Areas (TRSAs)** are shown in their entirety, symbolized by a screened black outline of the entire area including the various sectors within the area .

The outer limit of the entire Terminal Radar Service Areas (TRSA) is a continuous screened black line. The various sectors within the TRSA are symbolized by narrower screened black lines.

Each sector altitude is identified in solid black color by the MSL ceiling and floor values of the respective sector, eliminating the last two zeros. A leader line is used when the altitude values must be positioned outside the respective sectors because of charting space limitations. The TRSA name is shown near the north position of the TRSA as follows: **PALM SPRINGS TRSA**. Associated frequencies are listed in a table on the chart border.

**Military Training Routes (MTRs)** are shown on Sectionals and TACs. They are identified by the route designator: . Route designators are shown in solid black on the route centerline, positioned along the route for continuity. The designator IR or VR is not repeated when two or more routes are established over the same airspace, e.g., IR201-205-227. Routes numbered 001 to 099 are shown as IR1 or VR99, eliminating the initial zeros. Direction of flight along the route is indicated by small arrowheads adjacent to and in conjunction with each route designator.

The following note appears on Helicopters, Sectionals and TACs except for Hawaiian Islands, which is different.



**There are IFR (IR) and VFR (VR) routes as follows:**

**Route identification:**

- a. MTRs with no segment above 1500' are identified by four-digit numbers; e.g., VR1007, etc. These routes are generally developed to be flown under Visual Flight Rules.
- b. MTRs that include one or more segments above 1500' AGL are identified by three or fewer digit numbers; e.g., IR21, etc. These routes are developed to be flown, to the maximum extent possible under Instrument Flight Rules.

Route width varies for each MTR and can extend several miles on either side of the charted MTR centerline. Detailed route width information is available in the Flight Information Publication (FLIP) AP/1B (a Department of Defense publication), or through the 56 Day NASR Subscription from the National Flight Data Center (NFDC).

**Special Military Activity** areas are indicated on Sectionals by an underlying IFR Military Training Route with the lateral limits of the route shown by a gray Special Use Airspace symbol. A boxed note accompanies the area. The note contains radio frequency and route identifier information to use for obtaining area activity status.

SPECIAL MILITARY ACTIVITY  
FOR IR850, IR851, IR852 CTC BANGOR RADIO  
ON 122.4 255.4 FOR ACTIVITY STATUS

The following guidance appears in the margin of applicable Sectional Charts.

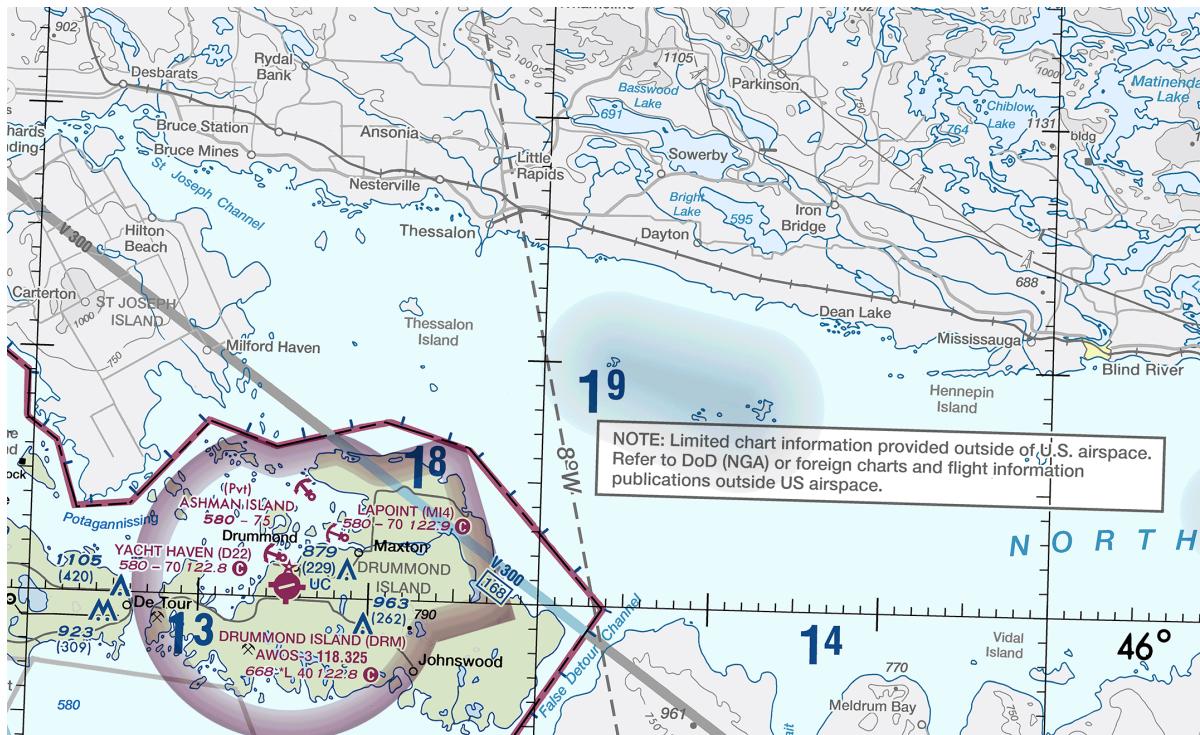
SPECIAL MILITARY ACTIVITY

The chart identifies IFR Military Training Routes and Military Operations Area within which the Department of Defense conducts periodic operations involving Unmanned Aircraft Systems. These aircraft may be accompanied by military or other aircraft which provide the pilots of the Unmanned Aircraft Systems visual observation information about other aircraft operations near them. Status of these routes and areas may be obtained by contacting the FAA/DoD facility on designated frequencies along the IFR route, referencing the identifier, e.g., IR214 as depicted on this chart. The lateral limits of these specified routes are shown by the Special Use Airspace symbol. Altitudes for these route segments are also shown.



## FOREIGN AREAS

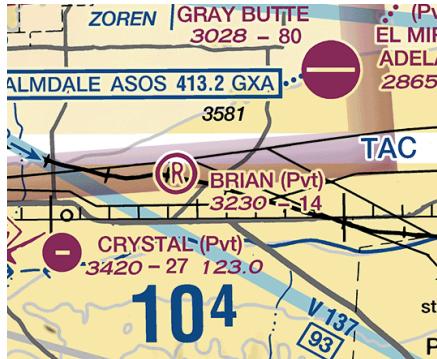
The data depicted in areas outside the U.S. is skeletonized on all VFR aeronautical charts. Only major airports, NAVAIDs, and airways are charted in foreign areas in screened black. Cultural features, hydrographic information and geographic relief are depicted in subdued and different shades of gray. A note regarding the expectation of the use of foreign charts and flight information publications is depicted along the boundary.



## TERMINAL AREA CHART (TAC) COVERAGE

TAC coverage is shown on appropriate Sectionals by a 1/4" masked line as indicated below. Within this area pilots should use TACs, which provide greater detail. A note indicating that the area is on the TAC appears near the masked boundary line.

**LOS ANGELES TERMINAL AREA**  
Pilots are encouraged to use the Los Angeles VFR Terminal Area Chart for flights at or below 10,000'

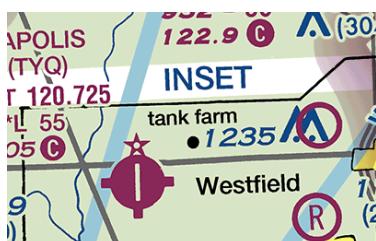


## INSET AND SPECIAL CHART COVERAGE

Inset and Special Chart Coverage (.i.e., Grand Canyon Chart) is shown on appropriate Sectionals by a 1/8" masked line as indicated below. A note to this effect appears near the masked boundary line. (Additional examples shown in VFR Sectional and Terminal Charts > Navigational and Procedural Information > Chart Limits.)

If inset chart is on the same chart as outline:  
**INDIANAPOLIS INSET**  
See inset chart for additional detail

If inset chart is on a different chart:  
**INDIANAPOLIS INSET**  
See inset chart on the St. Louis Sectional for additional information



## CHART TABULATIONS

**Airport Tower Communications** are provided in a columnized tabulation for all tower-controlled airports that appear on the respective chart. Airport names are listed alphabetically. If the airport is military, the type of airfield, e.g., AAF, AFB, NAS, is shown after the airfield name. In addition to the airport name, tower operating hours, primary Very High Frequency/Ultra High Frequency (VHF/UHF) local Control Tower (CT), Ground Control (GND CON), and Automatic Terminal Information Service (ATIS) frequencies, when available, will be given. Airport Surveillance Radar (ASR) and/or Precision Approach Radar (PAR) procedures are listed when available.

**Approach Control Communications** are provided in a columnized tabulation listing Class B, Class C, Terminal Radar Service Areas (TRSA) and Selected Approach Control Facilities when available. Primary VHF/UHF frequencies are provided for each facility. Sectorization occurs when more than one frequency exists and/or is approach direction dependent. Availability of service hours is also provided.

**Special Use Airspace (SUA):** Prohibited, Restricted and Warning Areas are presented in blue and listed numerically for U.S. and other countries. A tabulation of Alert Areas (listed numerically) and Military Operations Areas (MOA) (listed alphabetically) appear on the chart in magenta. All are supplemented with altitude, time of use and the controlling agency/contact facility, and its frequency when available. Users need to be aware that a NOTAM addressing activation will NOT be issued to announce permanently listed times of use. The controlling agency will be shown when the contact facility and frequency data is unavailable.

Airports with control towers are indicated on the face of the chart by the letters CT followed by the primary VHF tower frequency(ies). Information for each tower is listed in the table below. Operational hours are local time. The primary VHF and UHF tower and ground control frequencies are listed.

Automatic Terminal Information Service (ATIS) frequencies shown on the face of the chart are arrival VHF/UHF frequencies. All ATIS frequencies are listed in the table below. ATIS operational hours may differ from tower operational hours.

ASR and/or PAR indicate Radar Instrument Approach available.

"MON-FRI" indicates Monday through Friday.

O/T indicates other times.

### Frequencies (VHF/UHF)

CONTROL TOWER	OPERATES	TOWER	GND CON	ATIS	ASR/PAR
AIRBORNE	0700 MON-1800 SAT 0600-1800 SUN	119.475	121.6	124.925	
BLUE GRASS	CONTINUOUS	119.1 257.8	121.9	126.3	
BOLTON	0730-1930	128.1	121.3 (E) 121.8 (W)		ASR/PAR
CHARLOTTESVILLE-ALBEMARLE	0600-2300	124.5 338.275	121.9 338.275	118.425	PAR
CINCINNATI/NORTHERN KENTUCKY INTL	CONTINUOUS Runway dependent	{ 118.3 (RWYS 18R/36L & 09/27) 118.975 360.85 (RWY 18L/36R)	121.3 (E) 121.7 (W)	134.375 (ARR) 135.3 (DEP)	ASR
COX DAYTON INTL	CONTINUOUS	119.9 257.8	121.9	125.8	
EASTERN WV RGNL/ SHEPHERD	0700-2200 TUE-THU 0700-1600 FRI-SAT 1300-1800 SUN O/T BY NOTAM	124.3 236.6	121.8 275.8		Approach direction dependent

Airport Name

Hours of Operation (local time)

Radar Instru Approach avai

### Frequencies (VHF/UHF)

#### CLASS B, CLASS C, TRSA AND SELECTED RADAR APPROACH CONTROL FREQUENCIES

FACILITY	FREQUENCIES	SERVICE AVAILABILITY
CINCINNATI CLASS B	VHF { 119.7 (RWY 09/27 090°-269°) (RWY 18R/36L 180°-359°) UHF { 123.875 (RWY 09/27 270°-089°) (RWY 18L/36R 360°-179°) 363.15	CONTINUOUS
CHARLESTON CLASS C	124.1 269.125 (N) 119.2 269.125 (S)	CONTINUOUS
COLUMBUS CLASS C	120.2 317.775 (280°-099°) 132.3 279.6 (100°-279°)	CONTINUOUS
DAYTON CLASS C	127.65 294.5 (360°-090°) 118.85 327.1 (091°-180°) 134.45 316.7 (181°-359°)	Sectors for VHF and UHF traffic
BRISTOL TRSA	134.425 349.0 (047°-227°) 125.5 317.5 (228°-046°) O/T 127.85 371.85 ZTL CNTR	0600-2400 local time
HUNTINGTON TRSA	119.75 257.8 (S) 132.95 257.8 (N)	CONTINUOUS
PERKINSON/BAAF RADAR	118.75 353.9	CONTINUOUS

Airspace Name

O/T indicates Other times

Radar Approach Control

### SPECIAL USE AIRSPACE ON 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 nearest FSS 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 — VHF/UHF
R-6602 A	TO BUT NOT INCL 4000	CONTINUOUS MAY 1-SEP 15 †24 HRS IN ADVANCE	WASHINGTON CNTR	118.75 377.1
R-6602 B	4000 TO BUT NOT INCL 11,000	BY NOTAM 24 HRS IN ADVANCE	WASHINGTON CNTR	118.75 377.1
R-6602 C	11,000 TO BUT NOT INCL 18,000	BY NOTAM 24 HRS IN ADVANCE	WASHINGTON CNTR	118.75 377.1
A-220	TO 4000 AGL	0800-2200	NO A/G	

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

MOA NAME	ALTITUDE*	TIME OF USE†	CONTROLLING AGENCY/CONTACT FACILITY	FREQUENCIES — VHF/UHF
BRUSH CREEK	100 AGL TO BUT NOT INCL 5000	0800-2200 MON-SAT	INDIANAPOLIS CNTR	134.0 135.57
BUCKEYE	5000	0800-2200 MON-FRI 0800-1600 SAT-SUN	INDIANAPOLIS CNTR	134.0 135.57
EVERS	1000 AGL	SR-SS BY NOTAM	WASHINGTON CNTR	

\*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.

Sunrise to Sunset



# VFR SECTIONAL AND TERMINAL AREA CHARTS

## GENERAL INFORMATION

The symbols shown in this section illustrate those that appear in the Sectional Aeronautical Charts (Sectionals) and Terminal Area Charts (TACs). The same symbology is utilized in VFR Flyway Planning Charts, Helicopter Route Charts and Caribbean Aeronautical Charts (CACs), however the scale of the symbols may be different due to the particular chart scales. Where symbology is distinctive to a given chart, examples and explanations are given in the additional examples. These charts are updated every 56 days.

## AIRPORTS

### Landplane: Civil

Airports having control towers (CT) are shown in blue, all others are shown in magenta.

Non-Towered      Towered



### Ultralight Flight Park

(Selected)



All recognizable runways, including some that may be closed, are shown for visual identification purposes. Fuel available.



Runway patterns will be depicted at airports with at least one hard surfaced runway 1500' or greater in length.



### Landplane: Civil-Military

Non-Towered      Towered



### Landplane: Landmark Value

Fuel not available



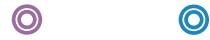
or  
Complete information is not available.



### Landplane: Military

Refueling and repair facilities not indicated.

Non-Towered      Towered



### Heliport

(Selected)

Non-Towered      Towered



### Foreign



### Foreign Airport Note

NOTE: Airports outside the U.S. Flight Information Region (FIR) are shown with the standard symbol.  
Only the airport names and ICAO identifiers are shown.

Appropriate note as required for hard surfaced runways only: "(CLOSED)"



**ABANDONED** - Depicted for landmark value or to prevent confusion with an adjacent usable landing area. (Normally at least 3000' paved).

## AIRPORTS (Continued)

### Seaplane

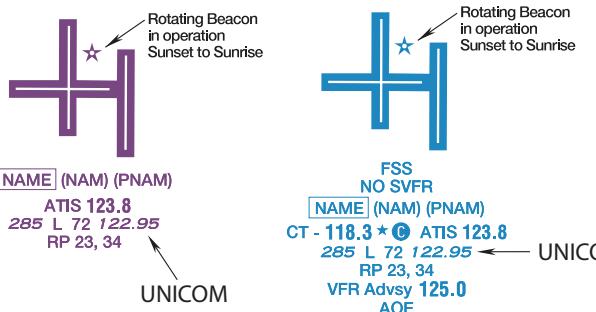


### Airport Data Grouping

Boxed airport name indicates airport for which a Special Traffic Rule has been established.

(Pvt): Non-public use having landmark value.

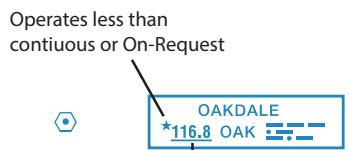
"OBJECTIONABLE": This airport may adversely affect airspace use.



Flight Service Station on field	FSS	Elevation in feet	285
Airports where fixed wing special VFR operations are prohibited (shown above airport name) FAR 91	NO SVFR	Lighting in operation Sunset to Sunrise	L
Indicates FAR 93 Special Air Traffic Rules and Airport Traffic Pattern		Lighting limitations exist; refer to Chart Supplement	*L
Location Identifier	(NAM)	Length of longest runway in hundreds of feet; usable length may be less.	72
ICAO Location Identifier	(PNAM)	Aeronautical advisory station	122.95
Control Tower (CT) - primary frequency	CT - 118.3	Runways with Right Traffic Patterns (public use)	RP 23,34
Star indicates operation part-time. See tower frequencies tabulation for hours of operation	*	See Chart Supplement	*RP
Follows the Common Traffic Advisory Frequency (CTAF)	C	VFR Advisory Service Shown when ATIS is not available and frequency is other than the primary CT frequency.	VFR Advsy 125.0
Automatic Terminal Information Services	ATIS 123.8	Weather Camera (Alaska)	WX CAM
Automatic Flight Information Service	AFIS 135.2	Airport of Entry	AOE
Automated Surface Weather Observing Systems; shown when full-time ATIS is not available.	ASOS/AWOS 135.42	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.	

# RADIO AIDS TO NAVIGATION

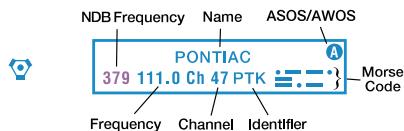
## VOR



Underline indicates no voice on this frequency

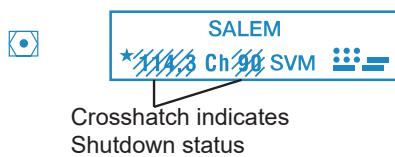
## VORTAC

When an NDB NAVAID shares the same name and Morse Code as the VOR NAVAID the frequency can be collocated inside the same box to conserve space.



Frequency Channel Identifier Morse Code

## VOR-DME



Crosshatch indicates Shutdown status

## DME

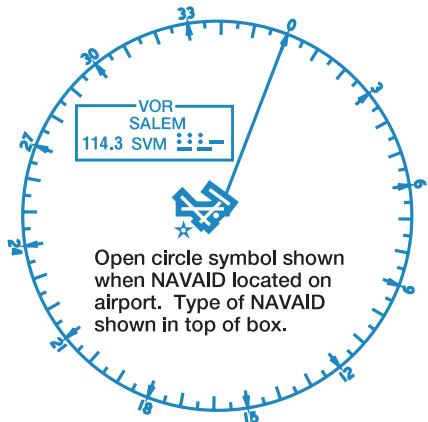


DME co-located at an airport  
Note: DMEs are shown without the compass rose.



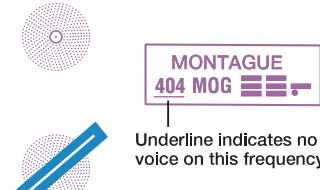
## Compass Rose

Compass Rose is "reference" oriented to magnetic north



Example of VOR NAVAID co-located at airport

## Non-Directional Radio Beacon (NDB)



Underline indicates no voice on this frequency

## NDB-DME



DME Ch 92 (114.5)

## NAVAID Used To Define Class B Airspace ILS Components

### ILS-DME



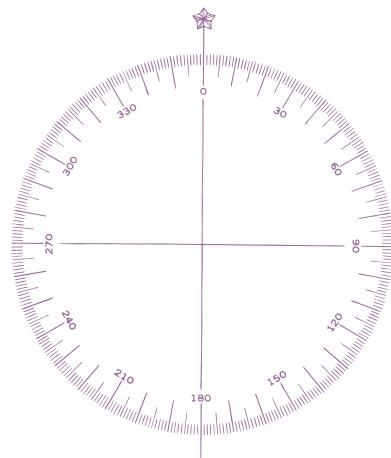
TAC - Shown when used in description of Class B airspace.



## Compass Rosette

Shown only in areas void of VOR roses.

Compass rosette will be based on the five year epoch magnetic variation model.



## RADIO AIDS TO NAVIGATION (Continued)

### Automated Weather Broadcast Services

Automated Weather Observing System (AWOS) / Automated Surface Observing System (ASOS).

VHF/UHF      LF/MF

**A**      **A**

### Flight Service Station (FSS)

Heavy line box indicates Flight Service Station (FSS). Frequencies 121.5, 122.2 and 243.0 are available at many Alaskan FSSs and are not shown above boxes. All other frequencies are shown. Frequencies transmit and receive except those followed by an R.

R - receive only

**PONTIAC PTK**

No NAVAID of the same name as FSS

OR

**122.1R**      **123.6**

**NORTHWAY**

**116.3 Ch 110 ORT**

FSS oper 0600-2200

Rancho Murieta FSS other times

NAVAID same name as FSS but not an RCO

### Off Airport AWOS/ASOS

SANDBERG ASOS 120.625 SDB

### Broadcast Stations (BS)

KFTM  
BS KFTM 1400

### Remote Communications Outlet (RCO)

Frequencies above thin line box are remoted to NAVAID site. Other frequencies at FSS providing voice communication may be available determined by altitude and terrain. Consult Chart Supplement for complete information.

**122.525**      **123.65**  
**HANCOCK RCO**  
**GREEN BAY**

**122.35**  
**ST PAUL**  
**108.6 STP**

**MINNEAPOLIS**

**122.35**  
**HUMPHREY**  
**275 HPY**

**MILES CITY**

FSS Radio providing voice communications

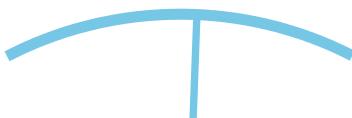
Thin line box without frequencies and controlling FSS name indicates no FSS frequency available.

## AIRSPACE INFORMATION

### Class B Airspace

#### Sectional

LAS VEGAS CLASS B



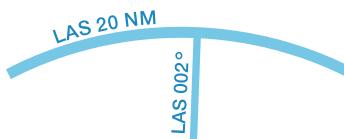
Appropriate notes as required may be shown.

Only the airspace effective below 18,000 feet MSL are shown.

(Mode C see FAR 91.215 / AIM)

### Terminal Area Chart (TAC)

LAS VEGAS CLASS B



CTC LAS VEGAS APP  
ON 121.1 OR 257.8

All mileages are nautical (NM).

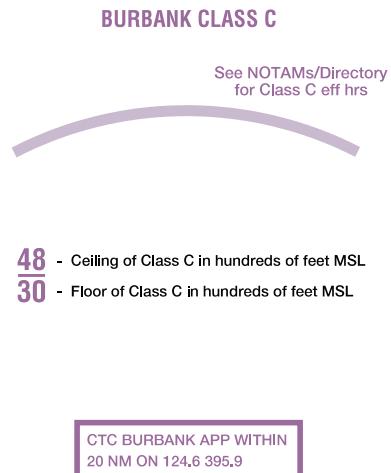
All radials are magnetic.

## AIRSPACE INFORMATION (Continued)

### Class C Airspace

Appropriate notes as required may be shown.

(Mode C see FAR 91.215/  
AIM)



### Class E Airspace

The limits of Class E airspace shall be shown by narrow vignettes or by the dashed magenta symbol. Individual units of designated airspace are not necessarily shown; instead, the aggregate lateral and vertical limits shall be defined by the following:

Airspace beginning at the surface (sfc) designated around airports.



Airspace beginning at 700 feet AGL that laterally abuts 1200 feet or higher Class E Airspace.



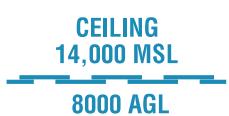
Airspace beginning at 700 feet AGL that laterally abuts uncontrolled (Class G) airspace.



Airspace beginning at 1200 feet AGL that laterally abuts uncontrolled (Class G) airspace.



Differentiates floors of airspace greater than 700 feet above the surface.



When the ceiling is less than 18,000 feet MSL, the value prefixed by the word "CEILING", shall be shown along the limits.

### Class D Airspace

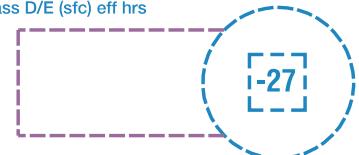
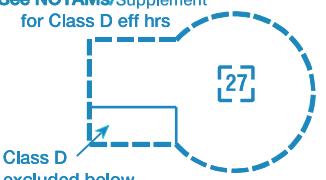
Altitude in hundreds of feet MSL

See NOTAMs/Supplement for Class D eff hrs

Class D excluded below 1500' MSL

See NOTAMs/Supplement for Class D/E (sfc) eff hrs

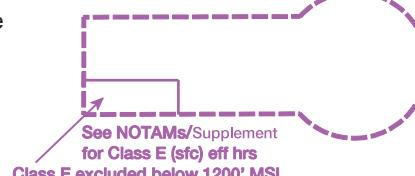
(A minus in front of the figure is used to indicate "from surface to but not including...")



Airspace beginning at the surface (sfc) designated around airports.



Airspace beginning at the surface with an airspace exclusion area where Class E airspace is excluded below 1200' MSL.



## AIRSPACE INFORMATION (Continued)

### Class E Airspace (Continued)

#### Low Altitude Airways VOR and LF/MF (Class E Airspace)

Low altitude Federal Airways are indicated by centerline.

Only the controlled airspace effective below 18,000 feet MSL is shown

V2N ← 270°

Alternate Airway radial

Total mileage  
between NAVAIDS  
on direct Airways.

25  
V2  
Enroute Airway radial

255°

R40

LF / MF Airway

T 319 TK 313

RNAV 2 Route (helicopter only)

BR 63V ← 265°

125 Bahama Route

A 301

Oceanic & ATS Route

AR5

Atlantic Route

B ROUTE 2

Class G Route

A 301 T 319

Federal / RNAV 2 Route

### Miscellaneous Air Routes

Combined Federal Airway/RNAV 2 "T" Routes are identified in solid blue type adjacent to the solid magenta federal airway identification.

The joint route symbol is screened magenta.

### Flight Information Regions (FIR)

No FIR exists this side - No ticks

MEXICO FIR MMFR

WINNIPEG FIR CZWG

NEW YORK OCEANIC CTA/FIR KZNY

### Oceanic Control Areas (OCA)

OAKLAND OCEANIC  
CONTROL AREA

### Control Areas (CTA)

MONTERREY CTA SECTOR 3

ATLANTIC LOW  
CONTROL AREA

Class G Airspace

9500 MSL

ATLANTIC LOW  
CONTROL AREA

8000 MSL

CONTROL AREA 1148L

### Offshore Control Areas

### Foreign Airspace Note

NOTE: Limited chart information provided outside of U.S. airspace. Refer to DoD (NGA) or foreign charts and flight information publications outside U.S. airspace.

## AIRSPACE INFORMATION (Continued)

### Special Conservation Areas

National Park, Wildlife Refuge, Primitive and Wilderness Areas, etc.



### Special Flight Rules Area (SFRA) Relating to National Security

Example: Washington DC

Appropriate notes as required may be shown.

Note: Delimiting line not shown when it coincides with International Boundary, projection lines or other linear features.

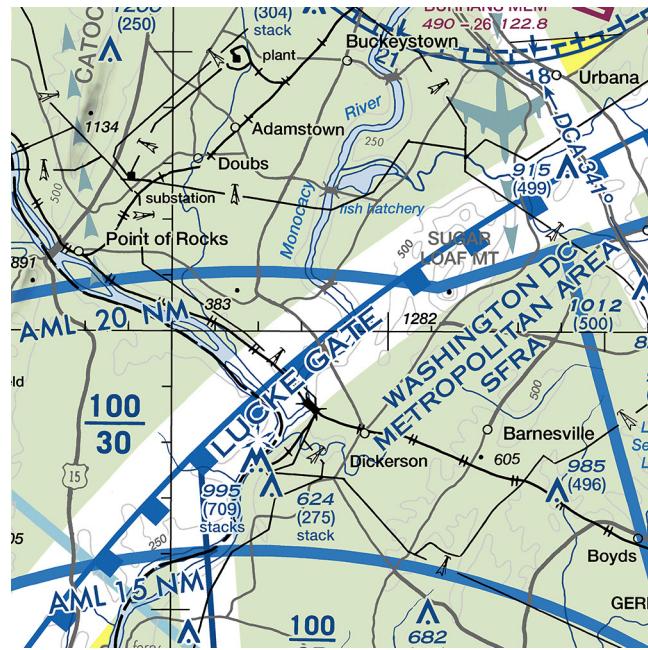


Washington DC Metropolitan Area Special Flight Rules Area/Flight Restricted Zone (DC SFRA & DC FRZ) (See description in Atlantic Ocean).

### NOAA Regulated National Marine Sanctuary Designated Areas



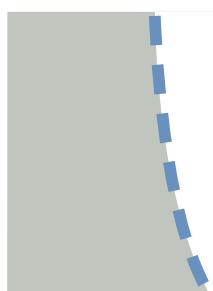
Flight operations below 1000' AGL over the designated areas within the Gulf of Farallones National Marine Sanctuary violate NOAA regulations (see 15 CFR 922).



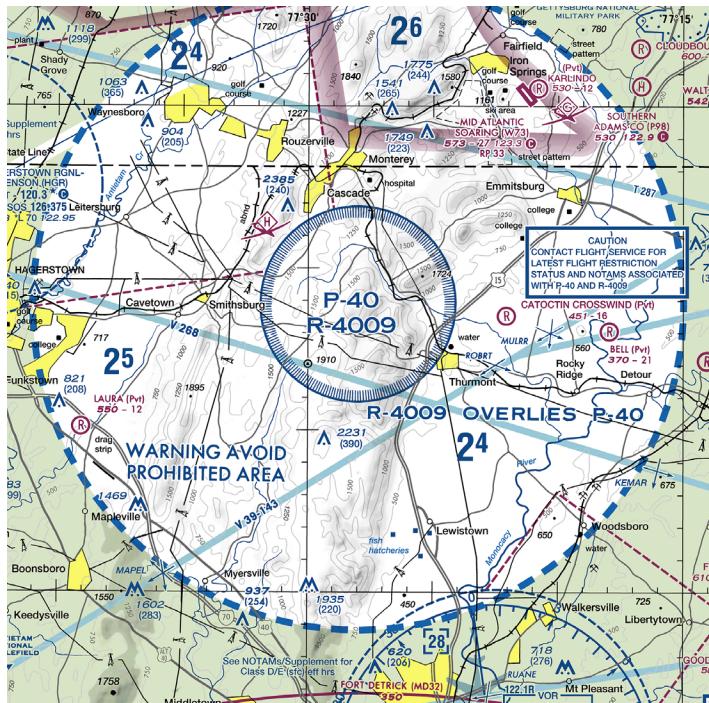
### Temporary Flight Restriction (TFR) Relating to National Security

Example: Washington DC

Appropriate notes as required may be shown.

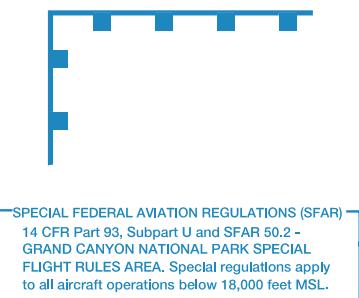


**CAUTION**  
CONTACT FLIGHT SERVICE FOR LATEST FLIGHT RESTRICTION STATUS AND NOTAMS ASSOCIATED WITH P-40 AND R-4009



## AIRSPACE INFORMATION (Continued)

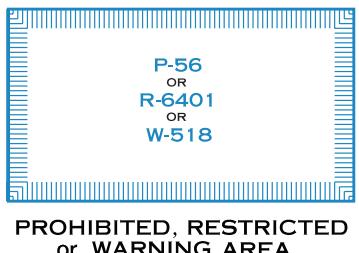
### Special Flight Rules Area (SFRA)



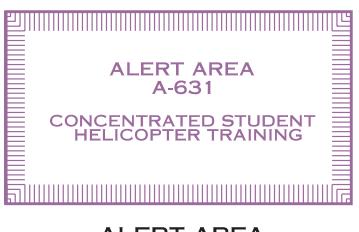
### Special Use Airspace

Only the airspace effective below 18,000 feet MSL is shown.

The type of area shall be spelled out in large areas if space permits.



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



### Special Air Traffic Rules / Airport Patterns (FAR Part 93)

Appropriate boxed note as required shown adjacent to area.

Inside the FAR Part 93 boundary area, the cross hatching is at a 45 degree angle. The hypsometric tint shall be masked within the area around the yellow city tint when applicable (should not be confused with white glacier tint).



**SPECIAL NOTICE**  
Pilots are required to obtain an ATC clearance prior to entering this area.

### Flight Restricted Zone (FRZ) Relating to National Security



### National Security Area

Appropriate notes as required may be shown



### Special Awareness Training Areas



### Mode C (FAR 91.215)

Appropriate notes as required may be shown.



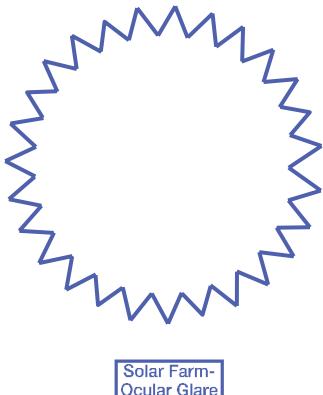
### Air Defense Identification Zone (ADIZ)

Note: Delimiting line not shown when it coincides with International Boundary, projection lines or other linear features.



## AIRSPACE INFORMATION (Continued)

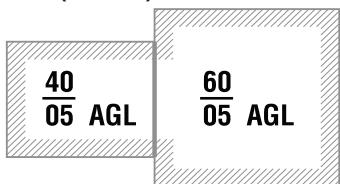
### High Energy Radiation Areas



### Military Training Routes (MTR)

VR269

### Special Military Activity Routes (SMAR)

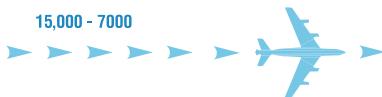


Boxed notes shown adjacent to route.

**40  
05 AGL**

### IFR Routes

Arrival



Departure

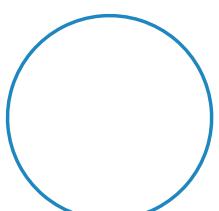


Arrival/Departure



TAC only

### Special Security Notice Permanent Continuous Flight Restriction Areas



**DISNEYLAND THEME PARK**  
See Note for requirements

### Sporting Event Temporary Flight Restriction (TFR) Sites

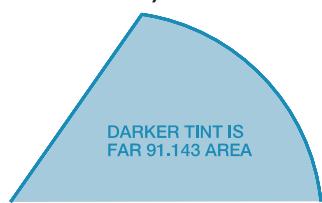


### National Defense Airspace Temporary Flight Restriction (TFR) Areas



**Dallas National Defense Airspace TFR Check NOTAMS**

### Space Operations Area (FAR Part 91.143)



### Miscellaneous Activity Areas

Aerobic Practice Area



Glider Operations



Hang Glider Activity



Ultralight Activity



Unmanned Aircraft Activity



Parachute Jumping Area with Frequency



Space Launch Activity Area



## AIRSPACE INFORMATION (Continued)

### VFR Transition Routes

Appropriate notes as required may be shown.

VFR TRANSITION ROUTE  
ATC CLEARANCE REQUIRED  
SEE SHOWBOAT GRAPHIC  
ON SIDE PANEL

Uni-directional



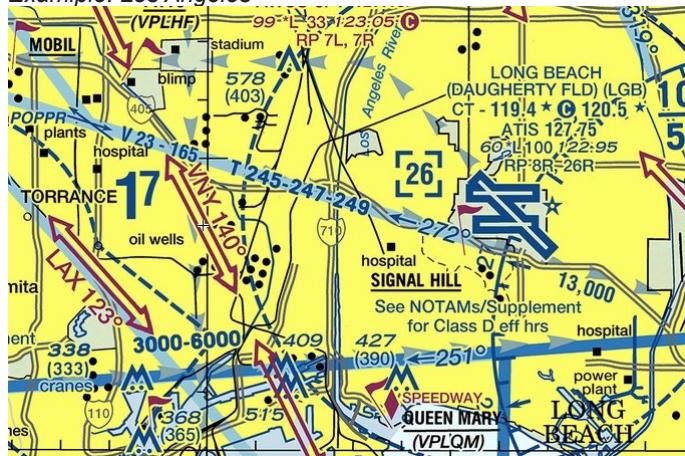
Bi-directional



Bi-directional with NAVAID Ident and Radial

VNY 140°  
TAC only

Example: Los Angeles



### Terminal Radar Service Area (TRSA)

TRSA Name

HARRISBURG TRSA

TRSA Boundaries



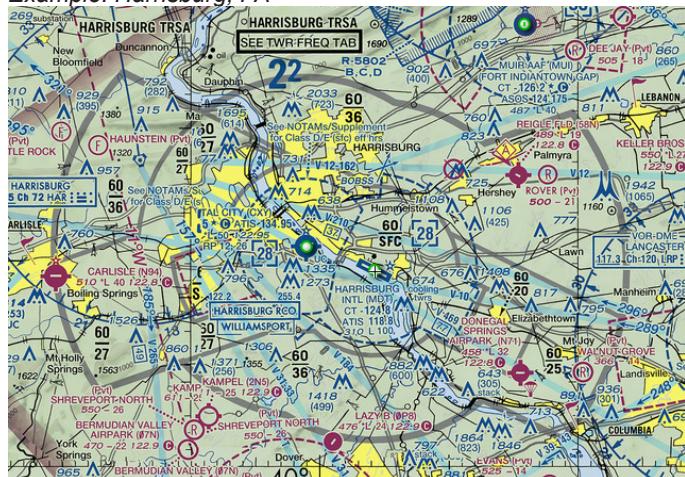
TRSA Sectors

Appropriate notes as required may be shown.

80  
40 - Ceiling of TRSA in hundreds of feet MSL  
- Floor of TRSA in hundreds of feet MSL

SEE TWR FREQ TAB

Example: Harrisburg, PA



## NAVIGATIONAL AND PROCEDURAL INFORMATION

### Isogonic Line and Value

Isogonic lines and values shall be based on the five year epoch magnetic variation model.

42°E

### Local Magnetic Notes

Unreliability Notes

Magnetic disturbance of as much as 78° exists at ground level and 10° or more at 3000 feet above ground level in this vicinity.

### Aeronautical Lights

By Request



Rotating or Oscillating

Isolated Location

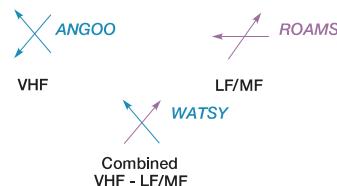


Rotating Light with Flashing Code  
Identification Light



### Intersections

Named intersections used as reporting points. Arrows are directed toward facilities that establish intersection.



Rotating Light with Course Lights and Site Number



## NAVIGATIONAL AND PROCEDURAL INFORMATION (Continued)

### Airport Beacons

Rotating or Flashing

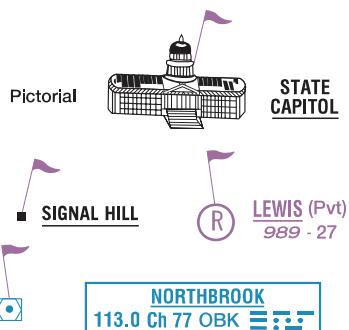


Isolated Locations

2520

### VFR Checkpoints

Underline indicates proper name of VFR Checkpoint.



### Waypoints

RNAV

GRANT

VFR Stand-Alone

VPXYZ

VFR Collocated with Checkpoint

NAME (VPXYZ)

### Obstruction

Above 200' & below 1000' AGL  
(above 299' AGL in urban area)

1473 (394)  
bldg

Under Construction (UC) or reported and position/elevation unverified

628 UC

1000' and higher (AGL)

3368 (1529)

Wind Turbine

2179 (315)

### High-Intensity Obstruction Lights

Less than 1000' (AGL)



1000' and higher (AGL)



Wind Turbine



Group obstruction



Wind Turbines



High-intensity lights may operate part-time or by proximity activation.

### Marine Lights

With Characteristics of Light

Oc  
R SEC  
Land Light

Red	R
White	*W
Green	G
Blue	BU
Orange	OR
Black	B
Yellow	Y
Sector	SEC
Fixed	F
Single Occulting	Oc
Group Occulting	Oc (2)
Composite Group Occulting	Oc (2+1)
Isophase	Iso
Flashing	Fl
Group Flashing	Fl (2)
Composite Group Flashing	Fl (2+1)
Quick	Q
Interrupted Quick/Interrupted Quick Flashing	IQ
Morse Code	Mo (A)
Fixed and Flashing	FFI
Alternating	AI
Group	Gp
Long Flash	LFI
Group Quick Flashing	Q (3)
Very Quick Flashing	VQ
Group Very Quick Flashing	VQ (3)
Interrupted Very Quick Flashing	IVQ
Ultra Quick Flashing	UQ
Interrupted Ultra Quick Flashing	IUQ

\* Marine Lights are white unless otherwise noted. Alternating lights are red and white unless otherwise noted.

### Group Obstruction

Above 200' & below 1000' AGL  
(above 299' AGL in urban area)

1062 (227)

1000' and higher (AGL)

4977 (1432)

At least two in group  
1000' and higher (AGL)

2889 (1217)

Wind Turbines

2735 (415)

### Wind Turbine Farms

When highest wind turbine is unverified,  
UC will be shown after MSL value.



### Maximum Elevation Figure (MEF)

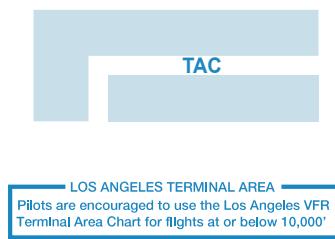
(see VFR Terms tab for explanation)

135

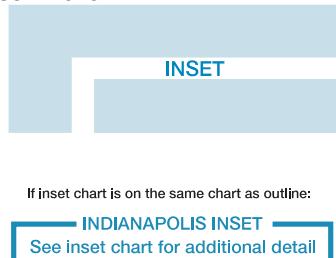
## NAVIGATIONAL AND PROCEDURAL INFORMATION (Continued)

### Chart Limits

#### Outline on Sectional of Terminal Area Chart



#### Outline on Sectional of Inset Chart



#### Outline of Special Chart on Sectional and Terminal Area Chart



If inset chart is on the same chart as outline:  
**INDIANAPOLIS INSET**  
See inset chart for additional detail

If inset chart is on a different chart:  
**INDIANAPOLIS INSET**  
See inset chart on the St. Louis Sectional for additional information

## CULTURE

### Railroads

Single Track



Double Track



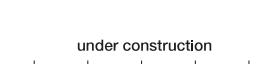
More Than Two Tracks



Electric



Non-operating, Abandoned or Under Construction



### Roads

Dual-Lane Divided Highway  
Category 1



Primary  
Category 2



Secondary  
Category 2



### Trails

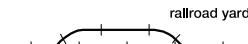
Category 3



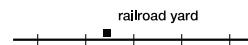
Provides symbolization for dismantled railroad when combined with label "dismantled railroad."

### Railroad Yards

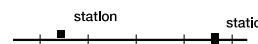
Limiting Track To Scale



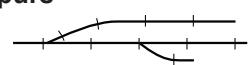
Location Only



### Railroad Stations



### Railroad Sidings and Short Spurs



### Road Markers

Interstate Route No.



U.S. Route No.



Air Marked Identification Label



### Road Names

LINCOLN HIGHWAY



### Roads Under Construction

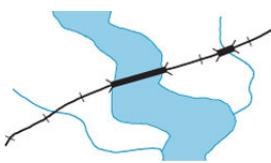


## CULTURE (Continued)

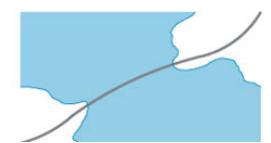
### Related Features to Railroads and Roads

#### Bridges and Viaducts

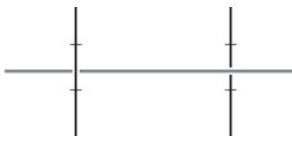
Railroad



Causeways



Overpasses and Underpasses



Tunnels-Road and Railroad



#### Populated Places

Yellow tinted areas indicate populated places.

Small circle indicates an area too small to depict using yellow tint.



Font Style and Size indicate the category of the populated area:

Large Cities Category 1

- population more than 250,000

Cities and Large Towns Category 2

- population 25,000 to 250,000

Towns and Villages Category 3

- population less than 25,000

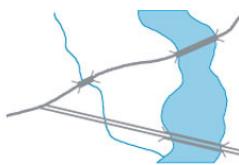
ST LOUIS

NASHVILLE

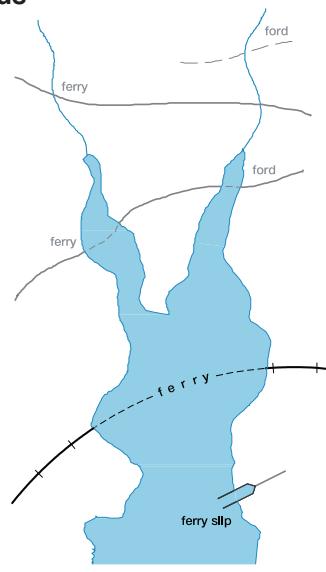
Frankfort

#### Bridges and Viaducts

Road



#### Ferries, Ferry Slips and Fords



## CULTURE (Continued)

### Boundaries

#### International



#### State or Province

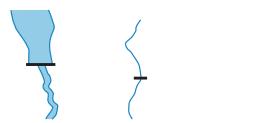


#### Convention or Mandate Line



### Miscellaneous Cultural Features

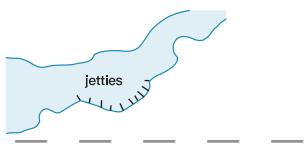
#### Dams



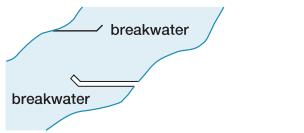
#### Passable Locks



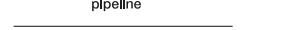
#### Weirs and Jetties



#### Breakwaters



#### Pipelines



#### Underground



#### Landmark Features

- substation
- fort
- cemetery

#### Mines or Quarries

##### Shaft Mines or Quarries



#### Wells

##### Other than water



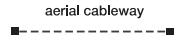
#### Lookout Towers

(Elevation Base of Tower)



618

#### Aerial Cableways, Conveyors, Etc.



### Time Zones

PST  
+8 (+1DT) = UTC  
MST  
+7 (+6DT) = UTC

#### Date Line



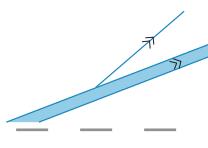
(Monday)

(Sunday)

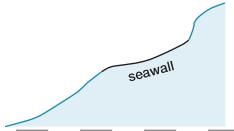
#### Dam Carrying Road



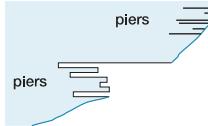
#### Small Locks



#### Seawalls



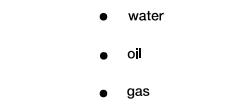
#### Piers, Wharfs, Quays, etc.



#### Power Transmission and Telecommunication Lines



#### Tanks



#### Outdoor Theater



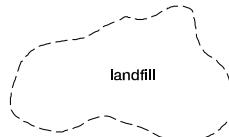
#### Race Tracks



#### Coast Guard Station



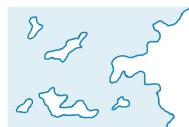
#### Landmark Areas



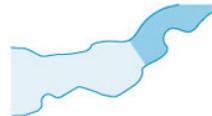
landfill

# HYDROGRAPHY

## Open Water



## Open/Inland Water



## Lakes

Label as required.



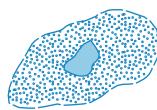
## Perennial

When too numerous to show individual lakes, show representative pattern and descriptive note. Number indicates elevation.



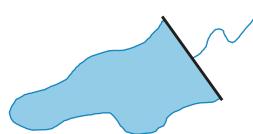
## Non-Perennial

(dry, intermittent, etc.) Illustration includes small perennial lake.



## Reservoirs

Natural Shorelines



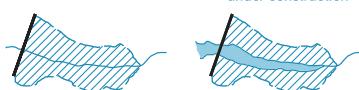
Man-made Shorelines  
Label when necessary for clarity



Too small to show to scale



Under Construction

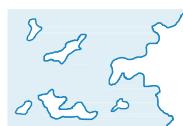


## Inland Water



## Shorelines

Definite



Fluctuating



Unsurveyed  
Indefinite



Man-made



## HYDROGRAPHY (Continued)

### Streams

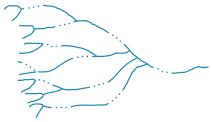
Perennial



Non-Perennial



Fanned Out



Alluvial fan



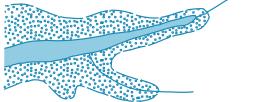
Braided



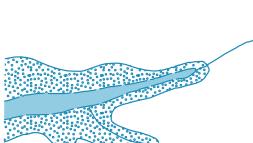
Disappearing



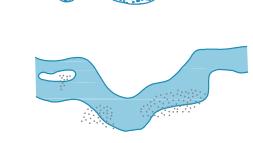
Seasonally Fluctuating



with undefined limits



with maximum bank limits,  
prominent and constant

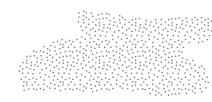


Sand Deposits in and along  
riverbeds



### Wet Sand Areas

Within and adjacent to desert areas



### Canals

ERIE



To Scale



Abandoned or Under Construction

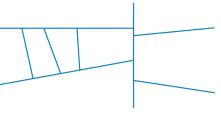


Abandoned to Scale

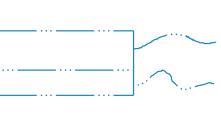


### Small Canals and Drainage / Irrigation Ditches

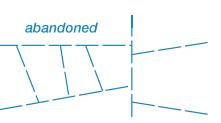
Perennial



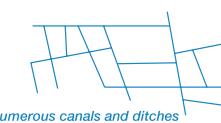
Non-Perennial



Abandoned or Ancient  
Numerous



Representative pattern and/or  
descriptive note.



*numerous canals and ditches*

### Aqueducts

aqueduct



Abandoned or Under Construction



Underground



Suspended or Elevated



Tunnels



Kanats

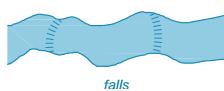


Underground with Air Vents

## HYDROGRAPHY (Continued)

### Falls

Double-Line

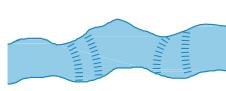


Single-Line



### Rapids

Double-Line



Single-Line



### Salt Evaporators and Salt Pans Man Exploited

*salt pans*



### Hummocks and Ridges



### Peat Bogs



### Rice Paddies

Extensive areas indicated  
by label only.



### Springs, Wells and Waterholes



### Swamps, Marshes and Bogs



### Mangrove And Nipa



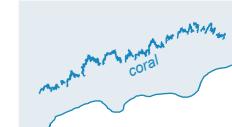
### Cranberry Bogs



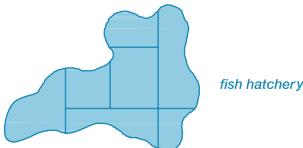
### Land Subject To Inundation



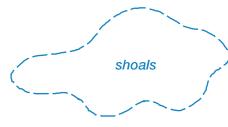
### Reefs-Rocky or Coral



### Fish Ponds and Hatcheries



### Miscellaneous Underwater Features Not Otherwise Symbolized



### Wrecks

Exposed



### Rocks-Isolated

Bare or Awash



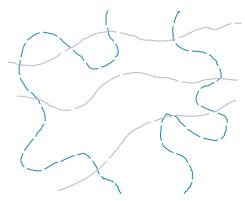
### Tundra

tundra

## HYDROGRAPHY (Continued)

### Permanent Snow and Ice Areas

#### Glaciers



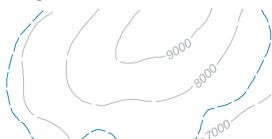
#### Glacial Moraines



#### Ice Cliffs

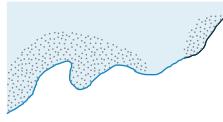


#### Snowfields, Ice Fields And Ice Caps



#### Foreshore Flats

Tidal flats exposed at low tide.



### RELIEF

#### Contours

##### Basic



##### Approximate



##### Intermediate

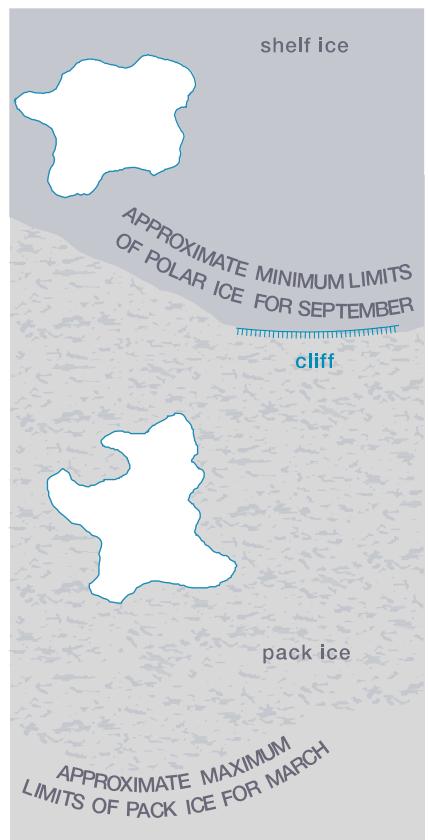


##### Auxiliary



#### Ice

##### Permanent Polar Ice

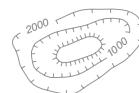


##### Pack Ice

#### Ice Peaks



Depression  
(Illustration includes mound within depression)



##### Values

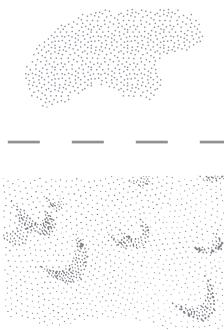


## RELIEF (Continued)

### Sand or Gravel Areas

#### Sand Dunes

To Scale



#### Hachuring



#### Spot Elevations

Position Accurate

2216



Position Accurate, Elevation Approximate

2260



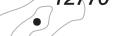
Highest in General Area

6973



Highest on Chart

12770



#### Mountain Pass

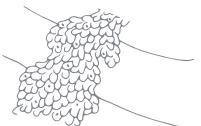
BRENNER  
PASS  
12632



#### Distorted Surface Areas

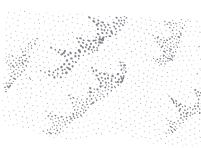


#### Lava Flows



#### Sand Ridges

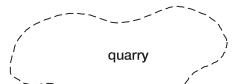
To Scale



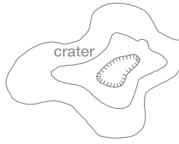
### Shaded Relief



### Quarries To Scale

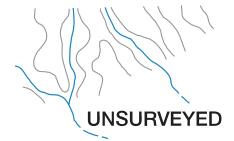


### Craters



### Unsurveyed Areas

Label appropriately as required



### Levees And Eskers



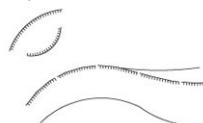
### Rock Strata Outcrop



### Strip Mines, Mine Dumps And Tailings

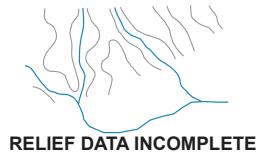


### Escarpsments, Bluffs, Cliffs, Depressions, Etc.



### Uncontoured Areas

Label appropriately as required





# VFR FLYWAY PLANNING CHARTS

## GENERAL INFORMATION

**VFR Flyway Planning Charts** are printed on the reverse sides of the Baltimore-Washington, Charlotte, Chicago, Cincinnati, Dallas-Ft. Worth, Denver, Detroit, Houston, Las Vegas, Los Angeles, Miami, Orlando, New Orleans, Phoenix, St. Louis, Salt Lake City, San Diego, San Francisco, Seattle, and Tampa Terminal Area Charts (TACs). The scale is 1:250,000, with area of coverage the same as the associated TACs. Flyway Planning Charts depict flight paths and altitudes recommended for use to by-pass areas heavily traversed by large turbine-powered aircraft. Ground references on these charts provide a guide for visual orientation. VFR Flyway Planning charts are designed for use in conjunction with TACs and are not to be used for navigation. These charts are updated every 56 days.

## AIRPORTS

### Landplane

No distinction is made between airports with fuel and those without fuel. Runways may be exaggerated to clearly portray the pattern. Hard-surfaced runways that are closed but still exist are included in the charted pattern.

FAR 91 - Fixed wing special VFR operations prohibited.

(Pvt): Non-public use having landmark value.

"OBJECTIONABLE": This airport may adversely affect airspace use.

### RADIO AIDS TO NAVIGATION

#### VHF Omni-Directional Radio Range (VOR)



#### VORTAC



#### VOR-DME



#### DME



Example: DME co-located at an airport.



### Landplane (continued)

ABANDONED - Depicted for landmark value or to prevent confusion with an adjacent usable landing area. Only portrayed beneath or close to the VFR flyway routes or requested by the FAA.  
(Normally at least 3000' paved).

FOREIGN



### Foreign Airport Note

NOTE: Airports outside the U.S. Flight Information Region (FIR) are shown with the standard symbol.  
Only the airport names and ICAO identifiers are shown.

### Non-Directional Radio Beacon (NDB)

NDB-DME



WDP 396

Underline indicates no voice on this frequency



LSJ 206

### NAVAIDS Used to Define Class Airspace

ILS - DME



Shared ILS - DME



## AIRSPACE INFORMATION

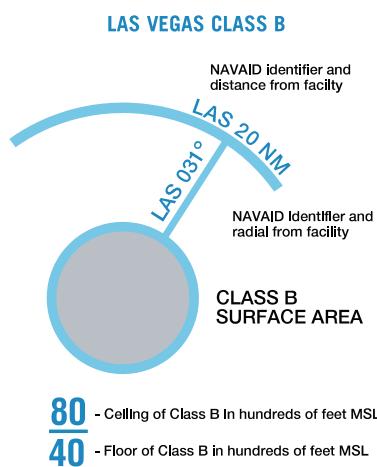
### Class B Airspace

Appropriate notes as required may be shown.

(Mode C see FAR 91.215/AIM)

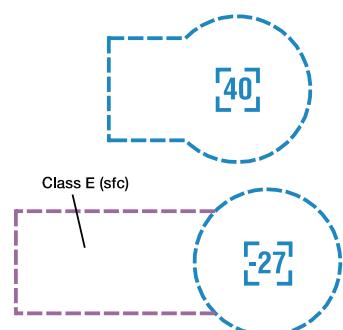
All mileages are nautical (NM).

All radials are magnetic.



Floors extending "upward and above" a certain altitude are preceded by a +. Operations at or below these altitudes are outside of the Class B Airspace.)

### Class D Airspace



(A minus sign in front of the figure used to indicate "from surface to but not including...")

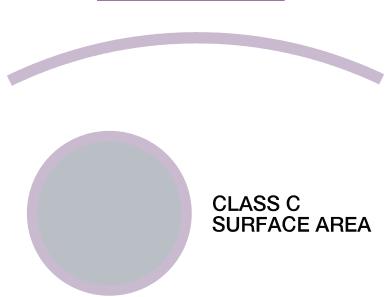
ALTITUDE IN HUNDREDS OF FEET MSL.

### Class C Airspace

Appropriate notes as required may be shown.

(Mode C see FAR 91.215/AIM)

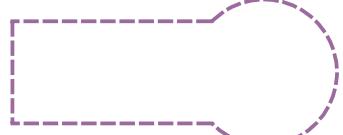
### EL TORO CLASS C



48 - Ceiling of Class C in hundreds of feet MSL  
30 - Floor of Class C in hundreds of feet MSL

T - Ceiling is to but not including floor of Class B  
SFC - Surface

### Class E Surface (SFC) Airspace



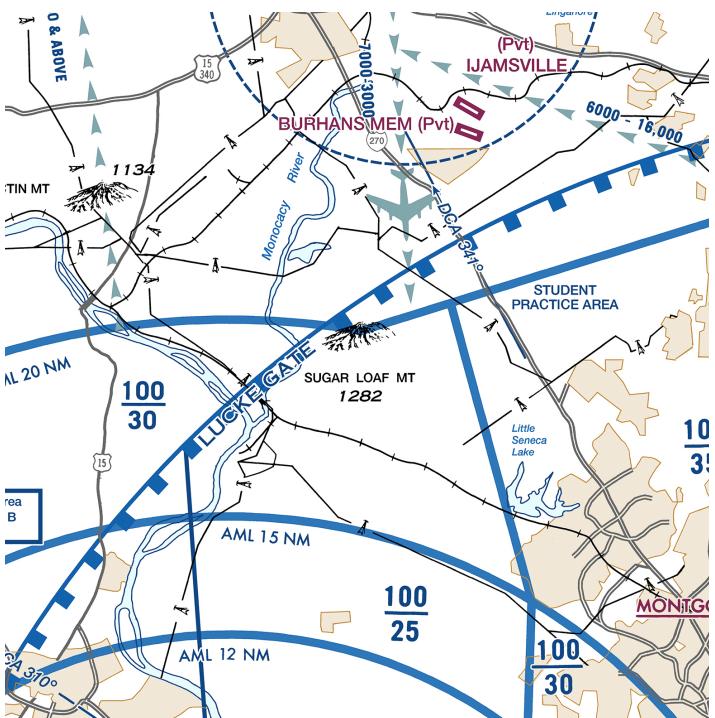
### Special Airspace Areas

#### Special Flight Rules Area (SFRA) Relating to National Security

Example: Washington DC

Appropriate notes as required may be shown.

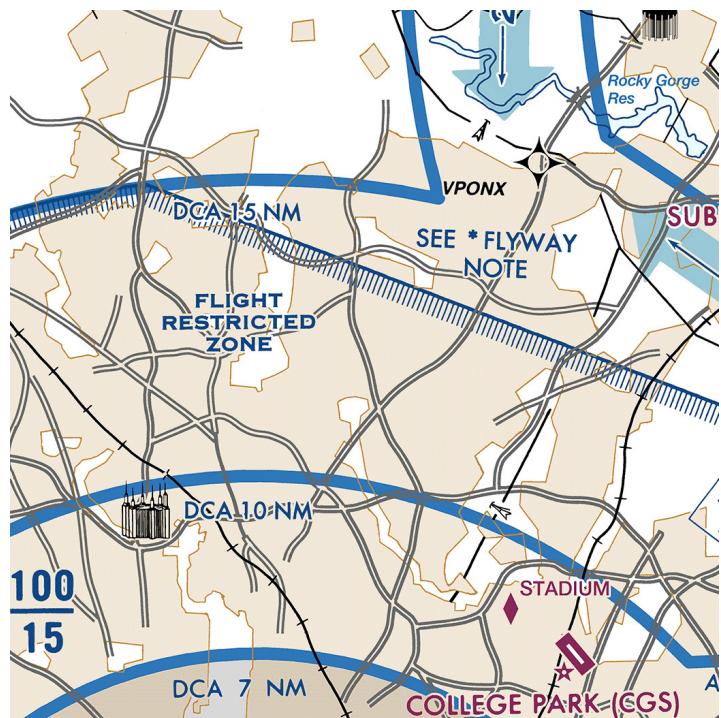
Note: Delimiting line not shown when it coincides with International Boundary, projection lines or other linear features.



## AIRSPACE INFORMATION (Continued)

### Flight Restricted Zone (FRZ) Relating To National Security

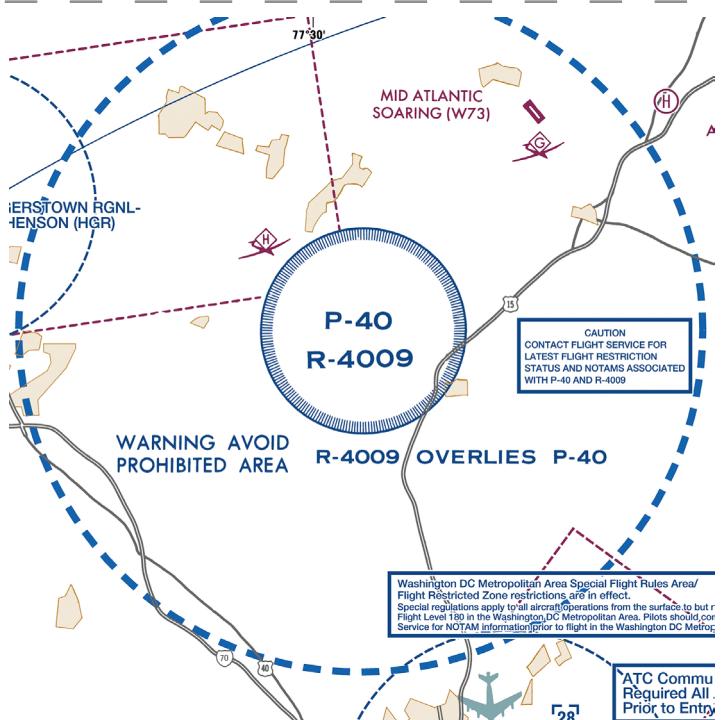
Example: Washington DC



### Temporary Flight Restriction (TFR) Relating To National Security

Example: Washington DC

Appropriate notes as required may be shown.



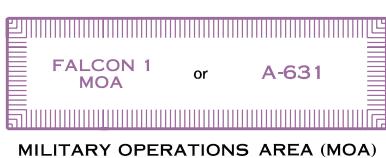
### Special Use Airspace

Only the airspace effective below 18,000 feet MSL is shown.



PROHIBITED, RESTRICTED  
or WARNING AREA

The type of area shall be spelled out in large areas if space permits.



MILITARY OPERATIONS AREA (MOA)  
or ALERT AREA

### Air Defense Identification Zone (ADIZ)

Note: Delimiting line not shown when it coincides with International Boundary, projection lines or other linear features.

**CONTIGUOUS U.S. ADIZ**

### Foreign Airspace Note

NOTE: Limited chart information provided outside of U.S. airspace. Refer to DoD (NGA) or foreign charts and flight information publications outside U.S. airspace.

## AIRSPACE INFORMATION (Continued)

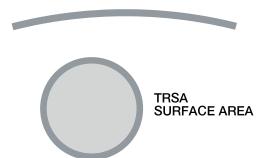
### Special Air Traffic Rules/Airport Traffic Areas (FAR Part 93)

Appropriate boxed note as required shown adjacent to area. Inside the FAR Part 93 boundary area, the cross hatching is at a 45 degree angle.



### Terminal Radar Service Area (TRSA)

PALM SPRINGS TRSA



**100** • Ceiling of TRSA in hundreds of feet MSL  
• Floor of TRSA in hundreds of feet MSL

### IFR Routes

Arrival



Departure



Arrival/Departure



### VFR Transition Routes

Appropriate notes as required may be shown.



Uni-directional



Bi-directional



Bi-directional with NAVAID Ident and Radial



### Special Conservation Areas

NOAA Regulated National Marine Sanctuary Designated Areas



Flight operations below 1000' AGL over the designated areas within the Gulf of Farallones National Marine Sanctuary violate NOAA regulations (see 15 CFR 922).

### Mode C (FAR 91.215)

Appropriate notes as required may be shown.



### Sporting Event Temporary Flight Restriction (TFR) Sites



### National Defense Airspace Temporary Flight Restriction (TFR) Areas



Dallas National Defense Airspace TFR Check NOTAMs

### Miscellaneous Activity Areas

Aerobic Practice Area



Glider Operations



Hang Glider Activity



Ultralight Activity



Unmanned Aircraft Activity



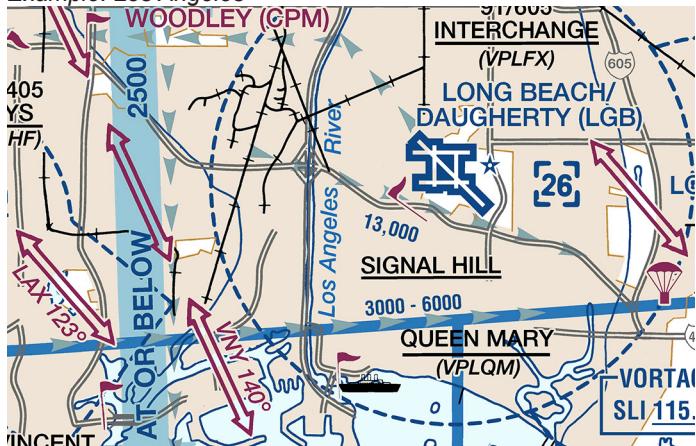
Parachute Jumping Area with Frequency



Space Launch Activity Area

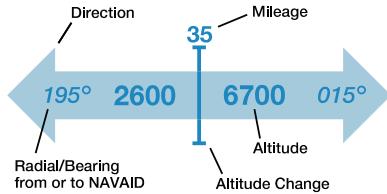


Example: Los Angeles



## AIRSPACE INFORMATION (Continued)

### Suggested VFR Flyway And Altitude



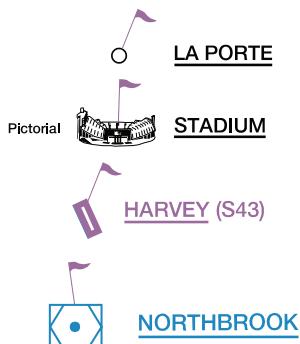
### Military Training Routes (MTR)



## NAVIGATIONAL AND PROCEDURAL INFORMATION

### VFR Checkpoints

Underline indicates proper name of VFR Checkpoint



### VFR Waypoints

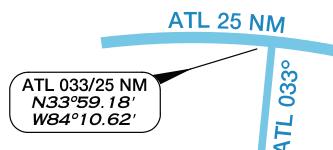
Stand-Alone



Collocated with VFR Checkpoint



### Navigational Data



### Obstructions

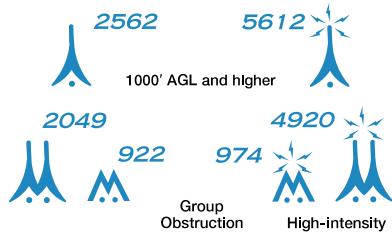
Obstacles may be lit or unlit.



Only obstacles greater than 999' above ground level (AGL) or specified by the local ATC Facility shall be shown.



AGL heights are not shown. High-intensity lights may operate part-time or by proximity activation.



Under Construction or reported and position/elevation unverified.

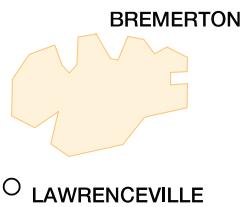


**CULTURE****Railroads**

Single and Multiple Tracks

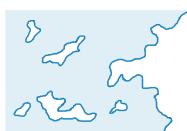
**Populated Places**

Built-up Areas



Towns

LAWRENCEVILLE

**BOUNDARIES****International****HYDROGRAPHY****Shorelines****RELIEF****Spot Elevations**Position Accurate  
Mountain Peaks**Roads**

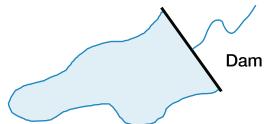
Dual-Lane



Divided Highway Primary

**Prominent Pictorials****Power Transmission Lines****Landmarks**

POWER PLANT

**Reservoirs****Major Lakes and Rivers**



# HELICOPTER ROUTE CHARTS

## GENERAL INFORMATION

**Helicopter Route Charts** are three-color charts that depict current aeronautical information useful to helicopter pilots navigating in areas with high concentrations of helicopter activity. Information depicted includes helicopter routes, four classes of heliports with associated frequency and lighting capabilities, NAVAIDS, and obstructions. In addition, pictorial symbols, roads, and easily identified geographical features are portrayed. The scale is 1:125,000. These charts are updated every 56 days.

## AIRPORTS

### Landplane

All recognizable runways, including some that may be closed, are shown for visual identification.



Public



Private



Unverified



Abandoned



Foreign



### Airport Data Grouping

Boxed airport name indicates airport for which a Special Traffic Rule has been established.

(Pvt): Non-public use having landmark value.

"OBJECTIONABLE": This airport may adversely affect airspace use.

Flight Service Station on field

FSS

Airspace where fixed wing special visual flight rules operations are prohibited (shown above airport name) FAR 91

NO SVFR

Indicates FAR 93 Special Air Traffic Rules and Airport Traffic

NAME

Location Identifier

(NAM)

ICAO Location Identifier

(PNAM)

Control Tower (CT) - primary frequency

CT - 119.1

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

\*

When lighting 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. Dashes are not shown on heliports or helipads unless additional information follows the elevation (e.g. UNICOM, CTAF).

### Seaplane



### Heliport



Heliports public and private

Medical Center



Helipads located at major airports  
(when requested)



### Ultralight Flight Park



### Foreign Airport Note

NOTE: Airports outside the U.S. Flight Information Region (FIR) are shown with the standard symbol.  
Only the airport names and ICAO identifiers are shown.



FSS  
NO SVFR  
NAME (NAM) (PNAM)  
CT - 119.1\* (119.8 HELI)  
ATIS 115.4  
ASOS/AWOS 135.42  
285 L 122.95  
(Unverified)  
AOE

Automated Terminal  
Information Service

ATIS 115.4

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

ASOS/AWOS 135.42

Elevation in feet

285

Lighting in operation Sunset to Sunshine

L

Lighting limitations exists, refer  
to Chart Supplement

'L

UNICOM - Aeronautical advisory station

122.95

Follows the Common Traffic Advisory  
Frequency (CTAF)

C

Unverified Heliport

(Unverified)

Airport of Entry

AOE

# RADIO AIDS TO NAVIGATION

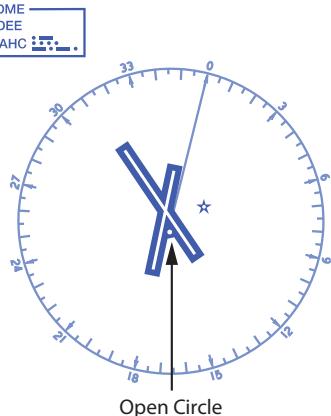
## NAVAIDS

### VHF Omni-Directional Radio (VOR) Range

Open circle symbol shown when NAVAID located on airport. Type of NAVAID shown in top of box.

Compass Rose is "reference" oriented to magnetic north.

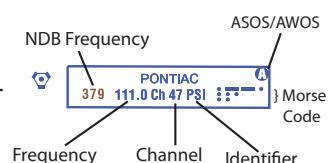
#### VOR



#### VORTAC

When an NDB NAVAID shares the same name and Morse Code as the VOR NAVAID the frequency can be collocated inside the same box to conserve space.

#### VOR-DME



#### DME



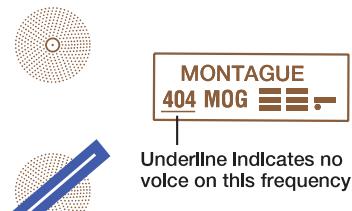
#### Flight Service Station (FSS)

Heavy line box indicates Flight Service Station (FSS). Frequencies 121.5, 122.2 and 243.0 are available at many Alaskan FSSs and are not shown above boxes. All other frequencies are shown.

Certain FSSs provide Airport Advisory Service, refer to Chart Supplement.

R - Receive Only

### Non-Directional Radio Beacon (NDB)



#### NDB-DME



### NAVAID Used to Define Class B Airspace



### Broadcast Stations (BS)

On request by the proper authority or when a VFR Checkpoint.



### Remote Communications Outlet (RCO)

Frequencies above thin line box are remoted to NAVAID site. Other FSS frequencies providing voice communications may be available as determined by altitude and terrain. Consult Chart Supplement for complete information.



# AIRSPACE INFORMATION

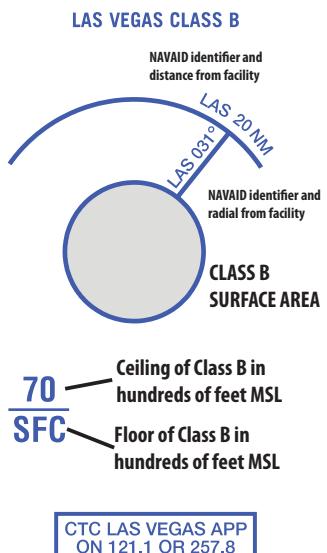
## Class B Airspace

Appropriate notes as required may be shown. (Mode C see FAR 91.215/AIM)

All mileages are nautical (NM)

(Floors extending "upward from above" a certain altitude are preceded by a +. Operations at and below these altitudes are outside of Class B Airspace.)

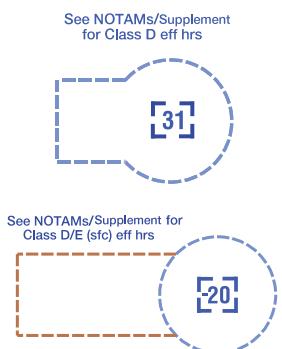
All radials are magnetic.



## Class D Airspace

(A minus in front of the figure is used to indicate "from surface to but not including...")

Altitudes in hundreds of feet MSL.



## Special Airspace Areas

### Special Flight Rules Area (SFRA) Relating to National Security

Example: Washington DC

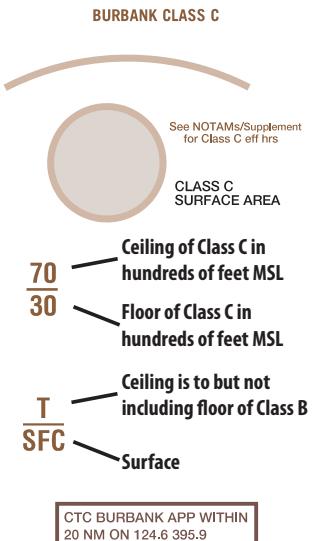
Appropriate notes as required may be shown.

Note: Delimiting line not shown when it coincides with International Boundary, projection lines or other linear features.

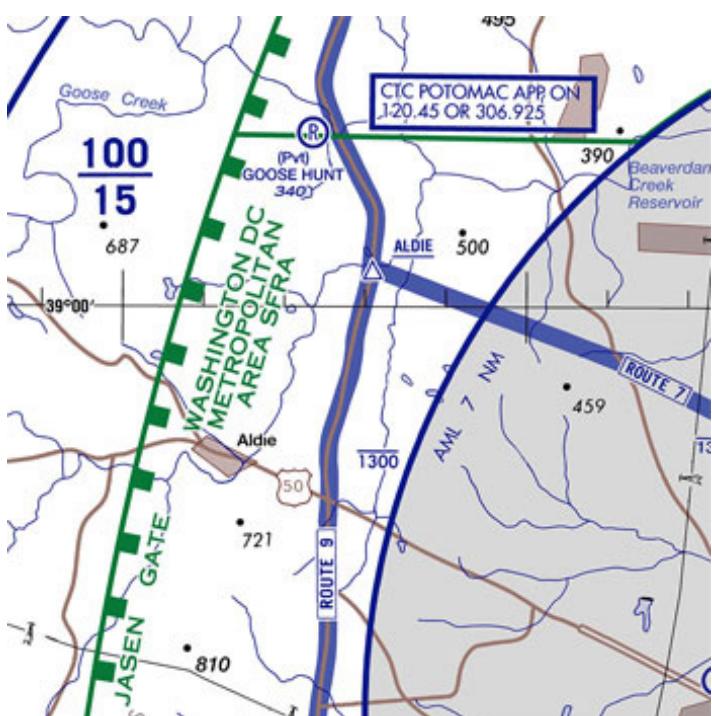


## Class C Airspace

Appropriate notes as required may be shown. (Mode C see FAR 91.215/AIM)



## Class E Surface (SFC) Airspace



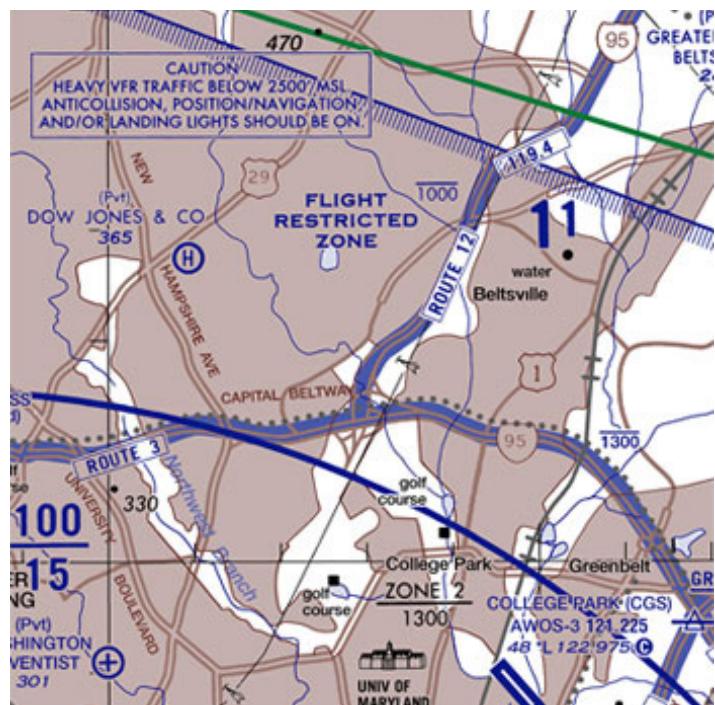
## AIRSPACE INFORMATION (Continued)

### Special Airspace Areas (Continued)

#### Flight Restricted Zone (FRZ) Relating to National Security



Example: Washington DC



#### Air Defense Identification Zone (ADIZ)

Note: Delimiting line not shown when it coincides with International Boundary, projection lines or other linear features.

#### CONTIGUOUS U.S. ADIZ



#### Special Security Notice Permanent Continuous Flight Restriction Areas

**DISNEYLAND THEME PARK**  
See Panel for requirements

#### Mode C (FAR 91.215)

Appropriate notes as required may be shown.

**MODE C & ADS-B OUT**  
30 NM

#### Terminal Radar Service Area (TRSA)

**PALM SPRINGS TRSA**



**SEE TWR FREQ TAB**

**80** - Ceiling of TRSA in hundreds of feet MSL  
**40** - Floor of TRSA in hundreds of feet MSL

#### Special Air Traffic Rules / Airport Traffic Areas (FAR Part 93)

Appropriate boxed notes as required shown adjacent to area. Inside the FAR Part 93 boundary area, the cross hatching is at a 45 degree angle.



**SPECIAL NOTICE**  
Pilots are required to obtain an ATC clearance prior to entering this area.

#### Sporting Event Temporary Flight Restriction (TFR) Sites



#### National Defense Airspace Temporary Flight Restriction (TFR) Areas



Dallas National Defense Airspace TFR  
Check NOTAMs

## AIRSPACE INFORMATION (Continued)

### Miscellaneous Activity Areas

Aerobatic Practice Area	
Glider Operations	
Hang Glider Activity	
Ultralight Activity	
Unmanned Aircraft Activity	
Parachute Jumping Area with Frequency	
Space Launch Activity Area	

### Military Training Routes (MTR)

### Helicopter Routes

Primary Route with Route Name and Tower Frequency

Secondary Route

Transition Symbol

### Reporting Points

Non-compulsory

Compulsory

Reporting Point Name

### Police Zones

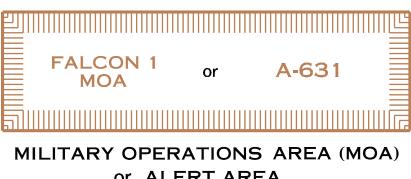
.....  
ZONE 8  
1000

### Special Use Airspace

Only the airspace effective below 18,000 feet MSL is shown.



The type of area shall be spelled out in large areas if space permits.



### One-way Route



### Altitude Changeover Point



### Recommended Altitudes

Maximum Altitude

Minimum Altitude

Recommended Altitude

### Foreign Airspace Note

NOTE: Limited chart information provided outside of U.S. airspace. Refer to DoD (NGA) or foreign charts and flight information publications outside U.S. airspace.

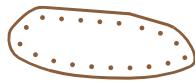
## AIRSPACE INFORMATION (Continued)

### Special Conservation Areas

National Park, Wildlife Refuge, Primitive and Wilderness Areas, etc.



NOAA Regulated National Marine Sanctuary Designated Areas

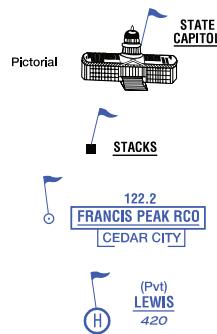


Flight operations below 1000' AGL over the designated areas within the Gulf of Farallones National Marine Sanctuary violate NOAA regulations (see 15 CFR 922).

## NAVIGATIONAL AND PROCEDURAL INFORMATION

### VFR Checkpoints

Underline indicates proper name of VFR Checkpoint.



### Obstruction

Above 299' and below 1000' AGL



1000' and higher AGL

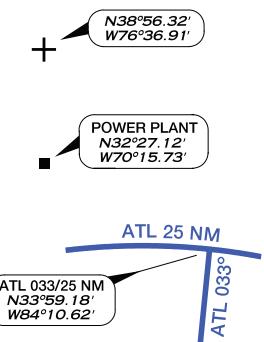


### High-Intensity Obstruction Lights

High-intensity lights may operate part-time or by proximity activation.



### Navigation Data



### VFR Waypoints

Stand-Alone



Collocated with VFR Checkpoint



Collocated with VFR Checkpoint & Reporting Point



### Group Obstruction

Above 299' and below 1000' AGL



1000' and higher AGL



### Wind Turbine Farms

When highest wind turbine is unverified, UC will be shown after MSL value.



### Maximum Elevation Figure (MEF)

(see VFR Terms tab for explanation)

**124**

## CULTURE

### Railroads

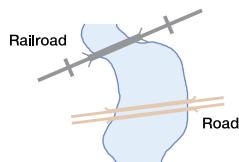
Single Track



Double Track

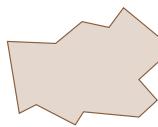


### Bridges



### Populated Places

Built-up Areas



### Roads

Dual-Lane:

Divided Highways



Major Boulevards & Major Streets

Primary



### Boundaries

International



State or Province



### Power Transmission Lines



### Prominent Pictorials



TEMPLE

### Landmarks

■ Landmark-stadium,  
factory, school, etc.

△ Lookout  
Tower

▲ Mines or  
Quarries

○ Race Track

● Outdoor  
Theater

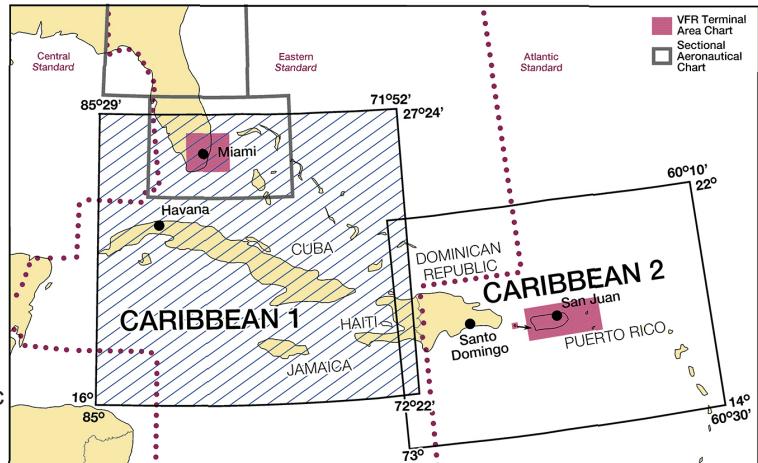
● Tank-water,  
oil or gas



# CARIBBEAN VFR AERONAUTICAL CHARTS (CAC)

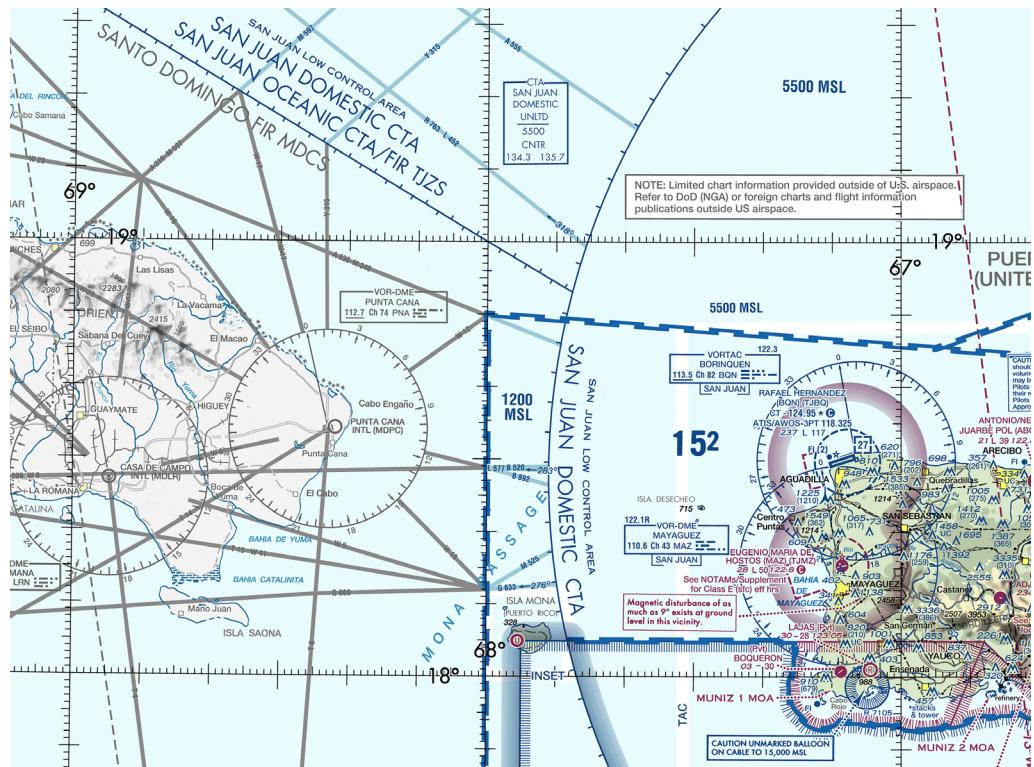
The Caribbean Charts are published as two VFR Charts: Caribbean 1 (CAC-1) covers Southern Florida, Cuba, Haiti and the Bahamas; Caribbean 2 (CAC-2) covers Puerto Rico, Haiti, Dominican Republic, the Lesser Antilles and Leeward Islands. Charts are updated every 56-day chart cycle.

Caribbean Charts are designed for VFR flights and provide aeronautical and topographic information of the Caribbean. The aeronautical information includes airports, radio aids to navigation, Class airspace and special use airspace in U.S. and major airports, and radio aids to navigation in foreign areas. The topographic information includes city tint, populated places, principal roads, drainage patterns and shaded relief.



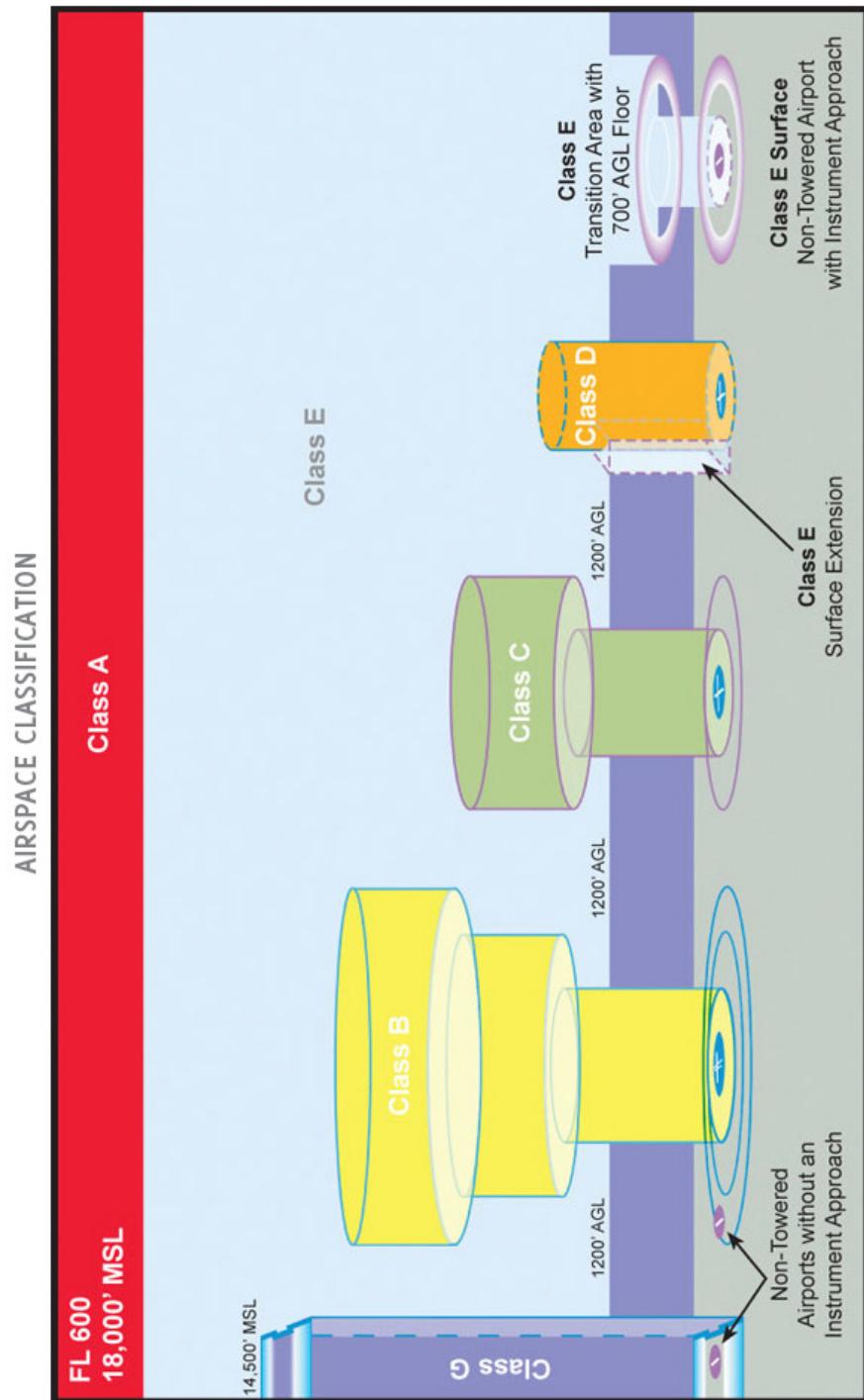
The chart symbols used on the Caribbean Charts are similar to those used in the Sectional and Terminal Area Charts, the major difference being in scale. The Caribbean VFR Chart scale is 1:1,000,000 versus the Sectional Chart Scale of 1:500,000 and Terminal Area Chart Scale of 1:250,000. Chart symbology will appear smaller on the Caribbean VFR Charts.

*Example from Caribbean 2 VFR Aeronautical Chart*

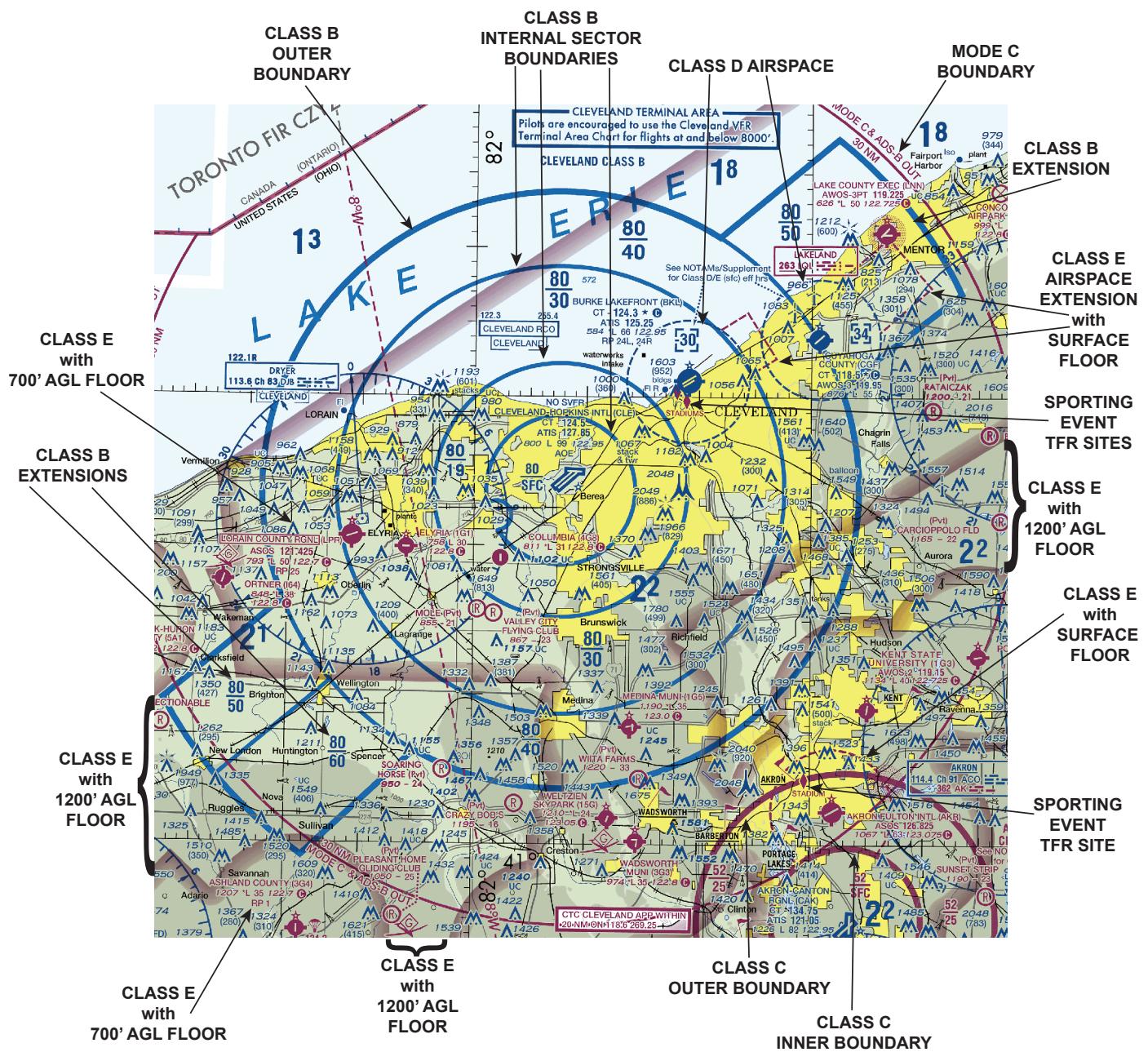




# AIRSPACE



U.S. Airspace depiction as shown on Visual Aeronautical Charts



Excerpt from Detroit Sectional Chart



# EXPLANATION OF IFR ENROUTE TERMS

FAA charts are prepared in accordance with specifications of the Interagency Air Committee (IAC), and are approved by representatives of the Federal Aviation Administration and the Department of Defense (DoD). Some information on these charts may only apply to military pilots.

The explanations of symbols used on Instrument Flight Rule (IFR) Enroute Charts and examples in this section are based primarily on the IFR Enroute Low Altitude Charts. Other IFR products use similar symbols in various colors. The chart legends portray aeronautical symbols with a brief description of what each symbol depicts. This section provides more details of the symbols and how they are used on IFR Enroute charts.

## AIRPORTS

Operational airports are shown on IFR Enroute Charts.

Low Charts:

- All IAP Airports are shown on the Low Altitude Charts (US and Alaska).
- Non-IAP Airports are shown on the U.S. Low Altitude Charts (Contiguous US) have a minimum hard surface runway of 3,000'.
- Non-IAP airports are shown on the U.S. Low Altitude Alaska Charts are show if the runway is 3000' or longer, hard or soft surface.
- Public heliports with an Instrument Approach Procedure (IAP) or requested by the FAA or DoD are depicted on the IFR Enroute Low Altitude Charts.
- Seaplane bases requested by the FAA or DoD are depicted on the IFR Enroute Low Altitude Charts.

On IFR Enroute Low Altitude Charts, airport tabulation is provided that identifies airport names, IDs and the panels they are located on.

High Charts:

- Airports shown on the U.S. High Enroute Charts (Contiguous US) have a minimum hard surface runway of 5000'.
- Airports shown on the U.S. High Enroute Alaska Charts have a minimum hard surface runway of 4000'.

Charted airports are classified according to the following criteria:



**Blue** - Airports with an Instrument Approach Procedure and/or RADAR MINIMA published in the high altitude DoD Flight Information Publications (FLIPs)

**Green** - Airports that have an approved Instrument Approach Procedure and/or RADAR MINIMA published in either the U.S. Terminal Procedures Publications (TPPs) or the DoD FLIPs

**Brown** - Airports without a published Instrument Approach Procedure or RADAR MINIMA

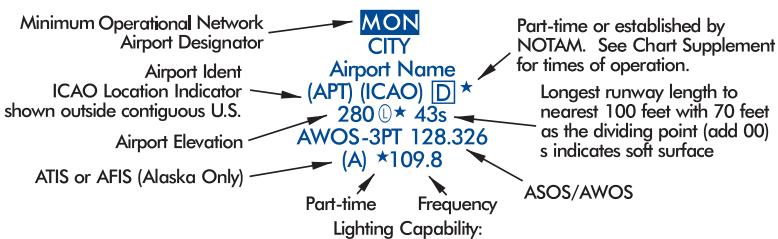
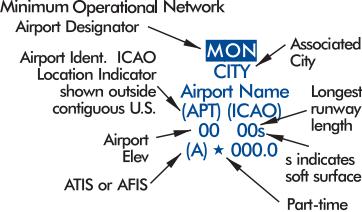
**Black** - Foreign airports

Airports are plotted at their true geographic position.

Airports are identified by the airport name. In the case of military airports, Air Force Base (AFB), Naval Air Station (NAS), Naval Air Facility (NAF), Marine Corps Air Station (MCAS), Army Air Field (AAF), etc., the abbreviated letters appear as part of the airport name.

Airports marked "Pvt" immediately following the airport name are not for public use, but otherwise meet the criteria for charting as specified above.

Runway length is the length of the longest active runway (including displaced thresholds but excluding overruns) and is shown to the nearest 100 feet using 70 feet as the division point; e.g., a runway of 8,070' is labeled 81. The following runway compositions (materials) constitute a hard-surfaced runway: asphalt, bitumen, chip seal, concrete, and tar macadam. Runways that are not hard-surfaced have a small letter "s" following the runway length, indicating a soft surface.

AIRPORT DATA DEPICTION	
Low Altitude	 <p>Minimum Operational Network Airport Designator</p> <p>Airport Ident ICAO Location Indicator shown outside contiguous U.S.</p> <p>Airport Elevation</p> <p>ATIS or AFIS (Alaska Only)</p> <p>Part-time</p> <p>Frequency</p> <p>Lighting Capability:</p> <p>MON CITY</p> <p>Airport Name (APT) (ICAO) D*</p> <p>280 0* 43s</p> <p>AWOS-3PT 128.326</p> <p>(A) *109.8</p> <p>Part-time or established by NOTAM. See Chart Supplement for times of operation.</p> <p>Longest runway length to nearest 100 feet with 70 feet as the dividing point (add 00) s indicates soft surface</p> <p>ASOS/AWOS</p>
1. Airport elevation given in feet above or below mean sea level	6. Associated city names for public airports are shown above or preceding the airport name. If airport name and city name are the same, only the airport name is shown. The airport identifier in parentheses follows the airport name. City names for military and private airports are not shown.
2. Pvt - Private use, not available to general public	7. Airport Ident ICAO Location Indicator shown outside contiguous U.S.
3. A solid line box enclosed the airport name indicates FAR 93 Special Requirements - see Directory/Supplement	8. AFIS Alaska only
4. "NO SVFR" above the airport name indicates FAR 91 fixed-wing special VFR flight is prohibited.	
5. C or D following the airport identifier indicates Class C or Class D Airspace	
High Altitude - U.S.	 <p>Minimum Operational Network Airport Designator</p> <p>Associated City</p> <p>Airport Name (APT)</p> <p>Airport Identifier</p>
High Altitude - Alaska	 <p>Associated City</p> <p>Longest runway length</p> <p>Part-time</p> <p>MON CITY</p> <p>Airport Name (APT) (ICAO)</p> <p>00 00s</p> <p>00.0</p> <p>Part-time</p> <p>Minimum Operational Network Airport Designator</p> <p>Airport Ident. ICAO Location Indicator shown outside contiguous U.S.</p> <p>Airport Elev</p> <p>ATIS or AFIS</p>
LIGHTING CAPABILITY	
L Lighting Available	★ Part-time or on request
(L) Pilot Controlled Lighting	- No lighting available At private facilities- indicates no lighting information is available

A **L** symbol between the airport elevation and runway length means that runway lights are in operation sunset to sunrise.

A **(L)** symbol indicates there is Pilot Controlled Lighting. A **L\*** symbol means the lighting is part-time or on request, the pilot should consult the Chart Supplement for light operating procedures. The Aeronautical Information Manual (AIM) thoroughly explains the types and uses of airport lighting aids.

### VOR Minimum Operational Network (MON) Airports Designator

MON Airports with the **MON** Airport designator at the top of the Airport Data Block. The MON designation is to alert pilots to those airports that have retained ILS and VOR instrument approach procedures for safe recovery in the event of a GPS outage. Refer to the Aeronautical Information Manual (AIM) for expanded MON Airport guidance.

## RADIO AIDS TO NAVIGATION

All IFR radio NAVAIDs that have been flight checked and are operational are shown on all IFR Enroute Charts. Very High Frequency/Ultrahigh Frequency (VHF/UHF) NAVAIDs, Very high frequency Omnidirectional Radio range (VORs), Tactical Air Navigation (TACANs) are shown in black, and Low Frequency/Medium Frequency (LF/MF) NAVAIDs, (Compass Locators and Aeronautical or Marine NDBs) are shown in brown.

On IFR Enroute Charts, information about NAVAIDs is boxed as illustrated below. To avoid duplication of data, when two or more NAVAIDs in a general area have the same name, the name is usually printed only once inside an identification box with the frequencies, TACAN channel numbers, identification letters, or Morse Code Identifications of the different NAVAIDs are shown in appropriate colors.

NAVAIDs in a shutdown status have the frequency and channel number crosshatched. Use of the NAVAID status "shutdown" is only used when a facility has been decommissioned but cannot be published as such because of pending airspace actions.

NAVIGATION AND COMMUNICATION BOXES - COMMON ELEMENTS	
LOW ENROUTE CHARTS	HIGH ENROUTE CHARTS
<i>RCO Frequencies</i> <i>NAVAID Name, SSV(s)</i> <i>FREQ, Ident, CH, Morse Code</i> <i>Latitude, Longitude</i> <i>Controlling FSS Name</i> <div style="text-align: center; margin-top: 20px;"> <span style="border: 1px solid black; padding: 2px;">000.0</span>  <span style="border: 1px solid black; padding: 2px;">NAME (VL) (T)</span>  <span style="border: 1px solid black; padding: 2px;">000.0 IDT 000 Ⓜ..</span>  <span style="border: 1px solid black; padding: 2px;">N00°00.00' W000°00.00'</span>  <span style="border: 1px solid black; padding: 2px;">NAME</span> </div>	<i>RCO Frequencies</i> <i>NAVAID Name</i> <i>Frequency, Ident, SSV(s), Channel</i> <i>Latitude, Longitude</i> <i>Controlling FSS Name</i> <div style="text-align: center; margin-top: 20px;"> <span style="border: 1px solid black; padding: 2px;">000.0</span>  <span style="border: 1px solid black; padding: 2px;">NAME</span>  <span style="border: 1px solid black; padding: 2px;">000.0 IDT (H) (DL) 000</span>  <span style="border: 1px solid black; padding: 2px;">N00°00.00' W000°00.00'</span>  <span style="border: 1px solid black; padding: 2px;">NAME</span> </div>
COMMON ELEMENTS (HIGH AND LOW CHARTS)	
<b>RCO FREQUENCY</b> <i>Single Frequency</i>  <i>Multiple Frequencies</i> <i>Frequencies transmit and receive except those followed by R and T:</i> <i>R - Receive Only      T - Transmit Only</i>	<div style="margin-bottom: 20px;"> <span style="border: 1px solid black; padding: 2px;">122.6</span> </div> <div style="margin-bottom: 20px;"> <span style="border: 1px solid black; padding: 2px;">255.4</span>  <span style="border: 1px solid black; padding: 2px;">243.0 123.6 122.65</span>  <span style="border: 1px solid black; padding: 2px;">122.2 122.1R 121.5</span> </div>
<b>NAVAID BOX</b>  <i>Thin line NAVAID boxes without frequency(s) and FSS radio name indicates no FSS frequencies available.</i>  <i>Shadow NAVAID box indicates NAVAID and Flight Service Station (FSS) have same name.</i>	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <span style="border: 1px solid black; padding: 5px; display: inline-block;">VHF/UHF</span> </div> <div style="text-align: center;"> <span style="border: 1px solid black; padding: 5px; display: inline-block;">LF/MF</span> </div> </div> <div style="margin-top: 20px;"> <span style="border: 1px solid black; padding: 5px; display: inline-block;"></span> <span style="border: 2px solid gold; padding: 5px; display: inline-block;"></span> </div>

**NAVAID STANDARD SERVICE VOLUME (SSV) CLASSIFICATIONS**

<b>SSV Class</b>	<b>Altitudes</b>	<b>Distance (NM)</b>
(T) Terminal	1000' to 12,000'	25
(L) Low Altitude	1000' to 18,000'	40
(H) High Altitude	1000' to 14,500' 14,500' to 18,000' 18,000' to 45,000' 45,000' to 60,000'	40 100 130 100
(VL) VOR Low	1000' to 5,000' 5,000' to 18,000'	40 70
(VH) VOR High	1000' to 5,000' 5,000' to 14,500' 14,500' to 18,000' 18,000' to 45,000' 45,000' to 60,000'	40 70 100 130 100
(DL) DME Low & (DH) DME High*	1000' to 12,900'	40 increasing to 130
(DL) DME Low	12,900' to 18,000'	130
(DH) DME High	12,900' to 45,000' 45,000' to 60,000'	130 100

\* Between 1000' to 12,900', DME service volume follows a parabolic curve used by flight management computers.

**Notes:** For NAVAIDs with two SSVs, the SSV for each component is shown in paired parentheses with the VOR SSV shown first followed by the DME or TACAN SSV. Additionally, High Altitude facilities provide Low Altitude and Terminal service volume and Low Altitude facilities provide Terminal service volume. Altitudes are with respect to the station's site elevation. Coverage is not available in a cone of airspace directly above the facility. In some cases local conditions (terrain, buildings, trees, etc.) may require that the service volume be restricted. The public shall be informed of any such restriction by a remark in the NAVAID entry or by a NOTAM.

<b>DISTANCE MEASURING EQUIPMENT</b>	
<i>Facilities that operate in the "Y" mode for DME reception</i>	(Y)
<b>VOICE COMMUNICATIONS VIA NAVAID</b>	
Voice Transmitted	112.6
No Voice Transmitted	111.0
<b>NAVAID SHUTDOWN STATUS</b>	
	VHF/UHF      LF/MF  
<b>PART TIME OR ON-REQUEST</b>	
	VHF/UHF      LF/MF ★      ★
<b>AUTOMATED WEATHER BROADCAST SERVICES</b>	
ASOS/AWOS - Automated Surface Observing Station/Automated Weather Observing Station	VHF/UHF      LF/MF Ⓐ      Ⓛ
	<i>Automated weather, when available, is broadcast on the associated NAVAID frequency.</i>
<b>LATITUDE AND LONGITUDE</b>	
<i>Latitude and Longitude coordinates are provided for those NAVAIDs that make up part of a route/airway or a holding pattern. All TACAN facilities will include geographic coordinates.</i>	LOW ENROUTE N00°00.00' W000°00.00' HIGH ENROUTE N00°00.00' W000°00.00'

# AIRSPACE INFORMATION

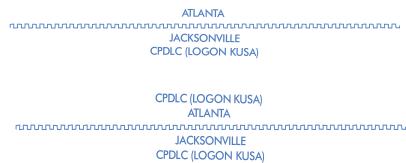
## CONTROLLED AIRSPACE

Controlled airspace consists of those areas where some or all aircraft are subjected to air traffic control within the following airspace classifications of A, B, C, D, & E.

Air Route Traffic Control Centers (ARTCC) are established to provide Air Traffic Control to aircraft operating on IFR flight plans within controlled airspace, particularly during the enroute phase of flight. Boundaries of the ARTCCs are shown in their entirety using the symbol below.

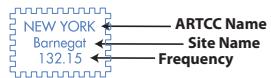


When Controller Pilot Data Link Communication (CPDLC) exists for an ARTCC, the text CPDLC (LOGON KUSA) will be shown parallel to the boundary above or below the ARTCC identification as shown below.



*Air Route Traffic Control Center (ARTCC) with  
Controller Pilot Data Link Communication (CPDLC)*

The responsible ARTCC Center names are shown adjacent and parallel to the boundary line. ARTCC sector frequencies are shown in boxes outlined by the same symbol.



*ARTCC Remoted Sites with  
discrete VHF and UHF frequencies*

**Class A** Airspace is depicted as open area (white) on the IFR Enroute High Altitude Charts. It consists of airspace from 18,000 Mean Sea Level (MSL) to FL600.

**Class B** Airspace is depicted as screened blue area with a solid line encompassing the area.

**Class C** Airspace is depicted as screened blue area with a dashed line encompassing the area with a letter "C" enclosed in a box following the airport name.

Class B and Class C Airspace consist of controlled airspace extending upward from the surface or a designated floor to specified altitudes, within which all aircraft and pilots are subject to the operating rules and requirements specified in the Federal Aviation Regulations (UHF) 71. Class B and C Airspace are shown in abbreviated forms on IFR Enroute Low Altitude Charts. A general note adjacent to Class B airspace refers the user to the appropriate VFR Terminal Area Chart.

**Class D** Airspace (airports with an operating control tower) are depicted as open area (white) with a letter "D" enclosed in a box following the airport name.

**Class E** Airspace is depicted as open area (white) on the IFR Enroute Low Altitude Charts. It consists of airspace below FL180.

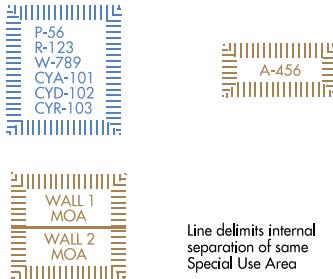
## UNCONTROLLED AIRSPACE

**Class G** Airspace within the United States extends to 14,500' MSL. This uncontrolled airspace is shown as screened brown.

## SPECIAL USE AIRSPACE

Special Use Airspace (SUA) confines certain flight activities, restricts entry, or cautions other aircraft operating within specific boundaries. SUA areas are shown in their entirety, even when they overlap, adjoin, or when an area is designated within another area. SUA with altitudes from the surface and above are shown on the IFR Enroute Low Altitude Charts. Similarly, SUA that extends above 18,000' MSL are shown on IFR Enroute High Altitude Charts. IFR Enroute Charts tabulations identify the type of SUA, ID, effective altitudes, times of use, controlling agency and the panel it is located on.

Users need to be aware that a NOTAM addressing activation will NOT be issued to announce permanently listed times of use.

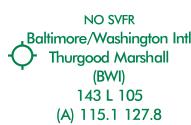


High and Low	Low Altitude Only
P - Prohibited Area	MOA - Military Operations Area
R - Restricted Area	A - Alert Area *
W - Warning Area	

\* Alert Areas do not extend into Class A, B, C and D airspace, or Class E airport surface areas.  
See Airspace Tabulation on chart for complete information.

## OTHER AIRSPACE

**FAR 91 Special Air Traffic Rules** are shown with the type NO SVFR above the airport name.



**FAR 93 Special Airspace Traffic Rules** are shown with a solid line box around the airport name, indicating FAR 93 Special Requirements see Chart Supplement.



**Mode C Required Airspace** (from the surface to 10,000' MSL) within 30 NM radius of the primary airport(s) for which a Class B airspace is designated, is depicted on IFR Enroute Low Altitude Charts as a blue circle labeled MODE C & ADS-B OUT 30 NM.



Mode C & ADS-B Out is also required for operations within and above all Class C airspace up to 10,000' MSL, but not depicted. See FAR 91.215 and the AIM.

## INSTRUMENT AIRWAYS

The FAA has established two fixed route systems for air navigation. The VOR and LF/MF system-designated from 1,200' Above Ground Level (AGL) to but not including FL 180 is shown on IFR Enroute Low Altitude Charts, and the Jet Route system designated from FL 180 to FL 450 inclusive is shown on IFR Enroute High Altitude Charts.

### VOR LF/MF AIRWAY SYSTEM (IFR LOW ALTITUDE ENROUTE CHARTS)

In this system VOR airways - airways based on VOR or VORTAC NAVAIDs - are depicted in black and identified by a "V" (Victor) followed by the route number (e.g., "V12").

LF/MF airways - airways based on LF/MF NAVAIDs - are sometimes called "colored airways" because they are identified by color name and number (e.g., "Amber One", charted as "A1"). In Alaska, Green and Red airways are plotted east and

west, and Amber and Blue airways are plotted north and south. Regardless of their color identifier, LF/MF airways are shown in brown.

## AIRWAY/ROUTE DATA

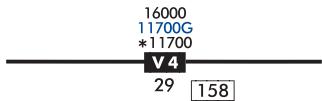
On both series of IFR Enroute Charts, airway/route data such as the airway identifications, magnetic courses bearings or radials, mileages, and altitudes (e.g., Minimum Enroute Altitudes (MEAs), Minimum Reception Altitudes (MRAs), Maximum Authorized Altitudes (MAAs), Minimum Obstacle Clearance Altitudes (MOCA), Minimum Turning Altitudes (MTAs) and Minimum Crossing Altitudes (MCAs)) are shown aligned with the airway.

As a rule the airway/route data is charted and in the same color as the airway, with one exception. Charted in blue, Global Navigation Satellite System (GNSS) MEAs, identified with a "G" suffix, have been added to "V" and "colored airways" for aircraft flying those airways using Global Positioning System (GPS) navigation.

Airways/Routes predicated on VOR or VORTAC NAVAIDs are defined by the outbound radial from the NAVAID. Airways/Routes predicated on LF/MF NAVAIDs are defined by the inbound bearing.

- **Minimum Enroute Altitude (MEA)** - The MEA is the lowest published altitude between radio fixes that assures acceptable navigational signal coverage and meets obstacle clearance requirements between those fixes. The MEA prescribed for a Federal airway or segment, RNAV low or high route, or other direct route applies to the entire width of the airway, segment, or route between the radio fixes defining the airway, segment, or route. MEAs for routes wholly contained within controlled airspace normally provide a buffer above the floor of controlled airspace consisting of at least 300 feet within transition areas and 500 feet within control areas. MEAs are established based upon obstacle clearance over terrain and man-made objects, adequacy of navigation facility performance, and communications requirements.
- **Minimum Reception Altitude (MRA)** - MRAs are determined by FAA flight inspection traversing an entire route of flight to establish the minimum altitude the navigation signal can be received for the route and for off-course NAVAID facilities that determine a fix. When the MRA at the fix is higher than the MEA, an MRA is established for the fix and is the lowest altitude at which an intersection can be determined.
- **Maximum Authorized Altitude (MAA)** - An MAA is a published altitude representing the maximum usable altitude or flight level for an airspace structure or route segment. It is the highest altitude on a Federal airway, jet route, RNAV low or high route, or other direct route for which an MEA is designated at which adequate reception of navigation signals is assured.
- **Minimum Obstruction Clearance Altitude (MOCA)** - The MOCA is the lowest published altitude in effect between radio fixes on VOR airways, off-airway routes, or route segments that meets obstacle clearance requirements for the entire route segment and assures acceptable navigational signal coverage only within 25 statute (22 nautical) miles of a VOR. A MOCA is only shown on the Enroute Low Charts and only published when it is lower than the MEA. When shown, it is preceded by an asterisk.
- **Minimum Turning Altitude (MTA)** - Minimum turning altitude (MTA) is a charted altitude providing vertical and lateral obstruction clearance based on turn criteria over certain fixes, NAVAIDs, waypoints, and on charted route segments. When a VHF airway or route terminates at a NAVAID or fix, the primary area extends beyond that termination point. When a change of course on VHF airways and routes is necessary, the enroute obstacle clearance turning area extends the primary and secondary obstacle clearance areas to accommodate the turn radius of the aircraft. Since turns at or after fix passage may exceed airway and route boundaries, pilots are expected to adhere to airway and route protected airspace by leading turns early before a fix. The turn area provides obstacle clearance for both turn anticipation (turning prior to the fix) and flyover protection (turning after crossing the fix). Turning fixes requiring a higher MTA are charted with a flag along with accompanying text describing the MTA restriction.

- Minimum Crossing Altitude (MCA)** - An MCA is the lowest altitude at certain fixes at which the aircraft must cross when proceeding in the direction of a higher minimum enroute IFR altitude. MCAs are established in all cases where obstacles intervene to prevent pilots from maintaining obstacle clearance during a normal climb to a higher MEA after passing a point beyond which the higher MEA applies. The same protected enroute area vertical obstacle clearance requirements for the primary and secondary areas are considered in the determination of the MCA.

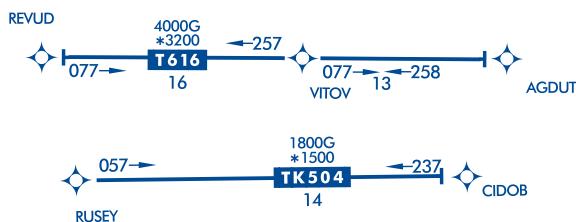


Victor Route (with RNAV/GPS MEA shown in blue)

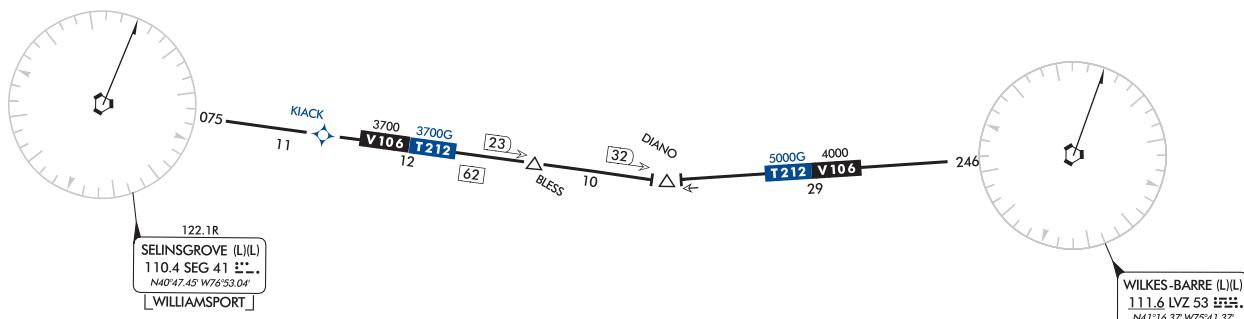
## AREA NAVIGATION (RNAV) "T" ROUTE SYSTEM

The FAA has created new low altitude area navigation (RNAV) "T" routes for the enroute and terminal environments. The RNAV routes will provide more direct routing for IFR aircraft and enhance the safety and efficiency of the National Airspace System. To utilize these routes aircraft are required to be equipped with IFR approved GNSS. In Alaska, TSO-145a and 146a equipment is required.

Low altitude RNAV only routes are identified by the prefix "T", and the prefix "TK" for RNAV helicopter routes followed by a three digit number (T-200 to T-500). Routes are depicted in blue on the IFR Enroute Low Altitude Charts. RNAV route data (route line, identification boxes, mileages, waypoints, waypoint names, magnetic reference courses and MEAs) will also be printed in blue. Magnetic reference courses will be shown originating from a waypoint, fix/reporting point or NAVAID. GNSS MEA for each segment is established to ensure obstacle clearance and communications reception. GNSS MEAs are identified with a "G" suffix.

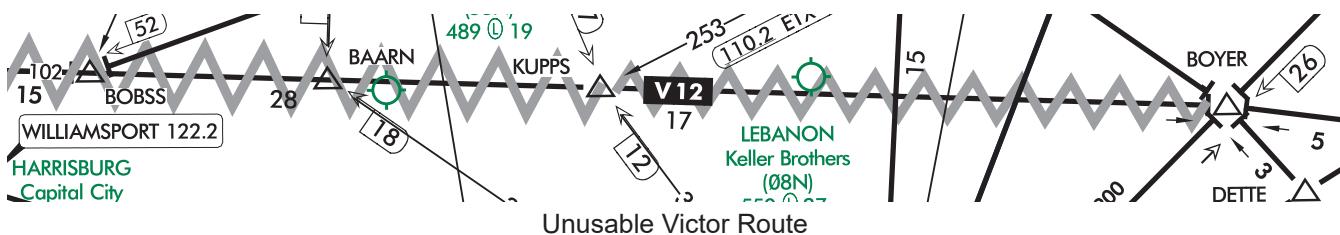


Joint Victor/RNAV routes are charted as outlined above except as noted. The joint Victor route and the RNAV route identification boxes are shown adjacent to each other. Magnetic reference courses are not shown. MEAs are charted above the appropriate identification box or stacked in pairs, GNSS and Victor. On joint routes, RNAV specific information will be printed in blue.



## UNUSABLE AIRWAY/ROUTE SEGMENTS

Airway/Route segments designated by the FAA as unusable will be depicted as shown below.



Unusable Victor Route

Pilots should not file a flight plan for or accept a clearance that includes navigation on any route or route segment depicted as unusable. Pilots using RNAV may request ATC clearance to fly point-to-point between valid waypoints or fixes, even those on routes depicted as unusable (refer to AC 90-108 for RNAV eligibility).

### Coincident Airways/Routes with Unusable Segment

When two airways/routes are coincident, but only one airway/route is designated as unusable, the following note indicating which airway the unusable symbology applies to will be placed in close proximity to the airway/route identifiers.



### OFF ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)

The Off Route Obstruction Clearance Altitude (OROCA) is depicted on IFR Enroute Low Altitude and Pacific charts and is represented in thousands and hundreds of feet above MSL. OROCAs are shown in every 30 x 30 minute quadrant on Area Charts, every one degree by one degree quadrant for IFR Enroute Low Altitude Charts - U.S. and every two degree by two degree quadrant on IFR Enroute Low Altitude Charts - Alaska. The OROCA is based on the highest known terrain feature or obstruction in each quadrangle, bounded by the ticked lines of latitude/longitude including data 4 NM outside the quadrant. In this example the OROCA represents 12,500 feet.

OROCA is computed just as the Maximum Elevation Figure (MEF) found on Visual Flight Rule (VFR) Charts except that it provides an additional vertical buffer of 1,000 feet in designated non-mountainous areas and a 2,000 foot vertical buffer in designated mountainous areas within the United States. Evaluating the area around the quadrant provides the chart user the same lateral clearance an airway provides should the line of intended flight follow a ticked line of latitude or longitude. OROCA altitudes are not assessed for NAVAID signal coverage, air traffic control surveillance, or communications coverage, and are published for general situational awareness, flight planning, and in-flight contingency use. OROCAs can be found over all land masses and open water areas containing man-made obstructions (such as oil rigs).

12<sup>5</sup>

### MILITARY TRAINING ROUTES (MTRs)

Military Training Routes (MTRs) are routes established for the conduct of low-altitude, high-speed military flight training (generally below 10,000 feet MSL at airspeeds in excess of 250 knots Indicated Air Speed). These routes are depicted in brown on IFR Enroute Low Altitude Charts, and are not shown on inset charts or on IFR Enroute High Altitude Charts. IFR Enroute Low Altitude Charts depict all IFR Military Training Routes (IRs) and VFR Military Training Routes (VRs), except those VRs that are entirely at or below 1,500 feet AGL.

MTRs are identified by designators (IR-107, VR-134) that are shown in brown on the route centerline. Arrows are shown to indicate the direction of flight along the route. The width of the route determines the width of the line that is plotted on the chart:

Route segments with a width of 5 NM or less, both sides of the centerline, are shown by a .02" line.



Route segments with a width greater than 5 NM, either or both sides of the centerline, are shown by a .035" line.



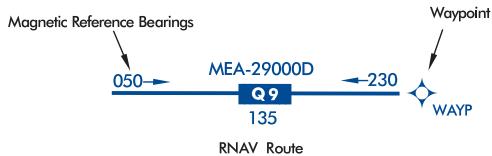
MTRs for particular chart pairs (ex. L1/2, etc.) are alphabetically, then numerically tabulated. The tabulation includes MTR type and unique identification and altitude range.

## JET ROUTE SYSTEM (HIGH ALTITUDE ENROUTE CHARTS)

Jet routes are based on VOR or VORTAC NAVAIDs, and are depicted in black with a "J" identifier followed by the route number (e.g., "J12"). In Alaska, Russia and Canada some segments of jet routes are based on LF/MF NAVAIDs.

## AREA NAVIGATION (RNAV) "Q" ROUTE SYSTEM (IFR ENROUTE HIGH ALTITUDE CHARTS)

The FAA has adopted certain amendments to Title 14, Code of Federal Regulations, which paved the way for the development of new area high altitude navigation (RNAV) "Q" routes in the U.S. National Airspace System (NAS). These amendments enable the FAA to take advantage of technological advancements in navigation systems such as the GPS. RNAV "Q" Route MEAs are shown when other than FL 180 MEAs for DME/DME/Inertial Reference Unit (IRU) RNAV aircraft have a "D" suffix.



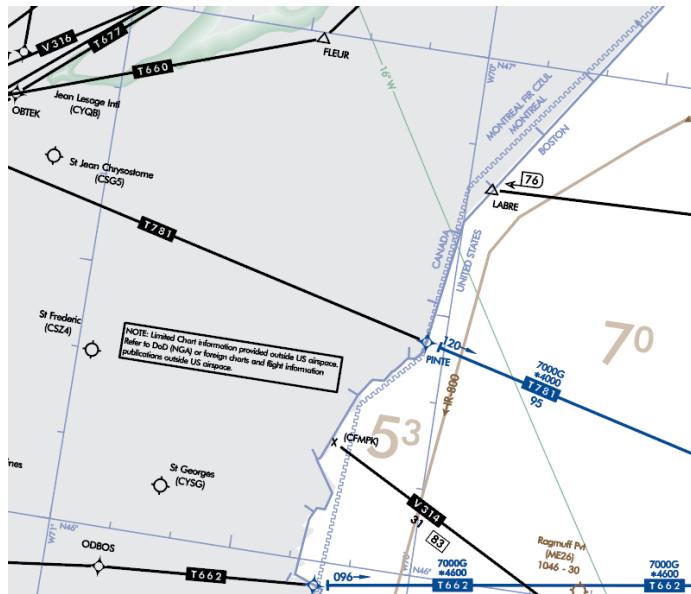
RNAV routes and associated data are charted in blue. "Q" Routes on the IFR Gulf of Mexico charts are shown in black. Magnetic reference courses are shown originating from a waypoint, fix/reporting point, or NAVAID.

Joint Jet/RNAV route identification boxes will be located adjacent to each other with the route charted in black. With the exception of Q-Routes in the Gulf of Mexico, GNSS or DME/DME/IRU RNAV are required, unless otherwise indicated. Q-Routes in Alaska are GNSS Only. Altitude values are stacked highest to lowest.



## FOREIGN AREAS

Limited data is depicted in areas outside the U.S. on all appropriate Enroute U.S., Alaska and Pacific High/Low IFR aeronautical charts. The data provided outside the U.S. is for situational awareness and transition planning. Areas outside of the U.S. have been skeletonized and symbolized in black and/or a black screen applied. This highlights the intent that U.S. charts should only be used for navigation within domestic airspace and charts of other countries should be used within their respective airspace.



## TERRAIN CONTOURS ON AREA CHARTS

Based on a recommendation of the National Transportation Safety Board, terrain contours have been added to the Enroute Area Charts and are intended to increase pilots' situational awareness for safe flight over changes in terrain. The following Area Charts portray terrain: Anchorage, Denver, Fairbanks, Juneau, Los Angeles, Nome, Phoenix, San Francisco, Vancouver and Washington.

When terrain rises at least a 1,000 feet above the primary airports' elevation, terrain is charted using shades of brown with brown contour lines and values. The initial contour will be 1,000 or 2,000 feet above the airports' elevation. Subsequent intervals will be 2,000 or 3,000 foot increments.

Contours are supplemented with a representative number of spots elevations and are shown in solid black. The highest elevation on an Area Chart is shown with a larger spot and text.

The following boxed note is added to the affected Area Charts.

NOTE: TERRAIN CONTOURS HAVE BEEN  
ADDED TO THOSE AREA CHARTS WHERE  
THE TERRAIN ON THE CHART IS 1000 FOOT  
OR GREATER THAN THE ELEVATION  
OF THE PRIMARY AIRPORT



# IFR ENROUTE LOW / HIGH ALTITUDE SYMBOLS (U.S., PACIFIC AND ALASKA CHARTS)

## AIRPORTS

### Airport Data - Low/High Altitude

Civil	Charts: High/Low 	Seaplane - Civil	Charts: Low 
Civil And Military	Charts: High/Low 	Heliport	Charts: Low 
Military	Charts: High/Low 	Emergency Use Only	Pacific Only 

Facilities in BLUE or GREEN have an approved Instrument Approach Procedure and/or RADAR MINIMA published in either the FAA Terminal Procedures Publication or the DoD FLIPs. Those in BLUE have an Instrument Approach Procedure and/or RADAR MINIMA published at least in the High Altitude DoD FLIPs. Facilities in BROWN do not have a published Instrument Procedure or RADAR MINIMA. Facilities in BLACK are foreign airports.

All IAP Airports are shown on the Low Altitude Charts.

Non-IAP Airports shown on the U.S. Low Altitude Charts have a minimum hard surface runway of 3000'.

Airports shown on the U.S. High Altitude Charts have a minimum hard surface runway of 5000'.

Airports shown on the Alaska High Altitude Charts have a minimum hard or soft surface runway of 4000'.

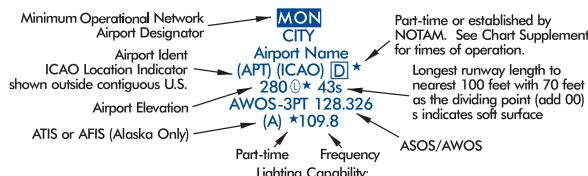
Associated city names for public airports are shown above or preceding the airport name and city name are the same only the airport name is shown. City names for military and private airports are not shown.

The airport identifier in parentheses follows the airport name or Pvt.

Pvt - Private Use

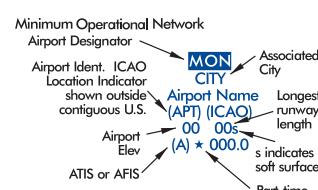
## AIRPORT DATA DEPICTION

### Low Altitude



1. Airport elevation given in feet above or below mean sea level
2. Pvt - Private use, not available to general public
3. A solid line box enclosed the airport name indicates FAR 93 Special Requirements - see Directory/Supplement
4. "NO SVFR" above the airport name indicates FAR 91 fixed-wing special VFR flight is prohibited.
5. C or D following the airport identifier indicates Class C or Class D Airspace
6. Associated city names for public airports are shown above or preceding the airport name. If airport name and city name are the same, only the airport name is shown. The airport identifier in parentheses follows the airport name. City names for military and private airports are not shown.
7. Airport Ident ICAO Location Indicator shown outside contiguous U.S.
8. AFIS Alaska only

### High Altitude - U.S.



## Airports (Continued)

### LIGHTING CAPABILITY

L Lighting Available

★ Part-time or on request

(L) Pilot Controlled Lighting

- No lighting available  
At private facilities- indicates no lighting information is available

### RADIO AIDS TO NAVIGATION

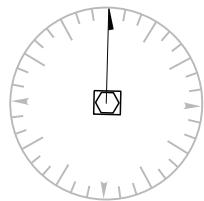
#### NAVAIDS

VOR	VOR/DME	TACAN	DME	NDB	NDB/DME	Reporting Function
						Non Compulsory Reporting or Off Airway
						Compulsory Reporting

Note: VHF/UHF is depicted in Black. LF/MF is depicted in Brown. RNAV is depicted in Blue

### Compass Roses

#### VHF/UHF



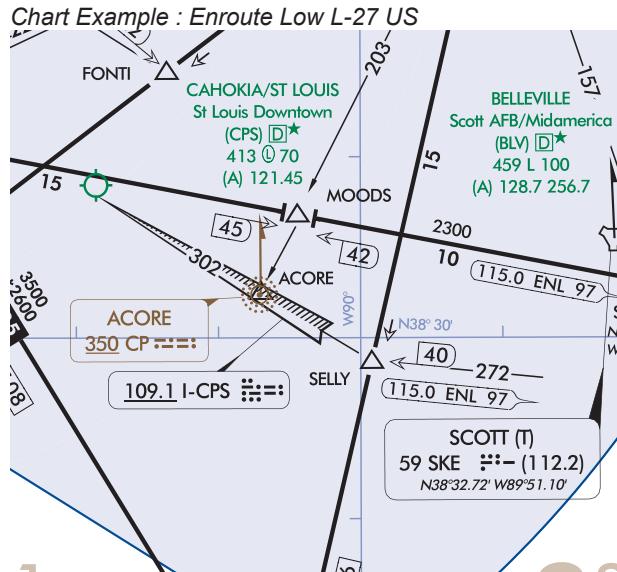
#### LF/MF



Compass Roses are oriented to Magnetic North of the NAVAID that cannot be adjusted to the charted isogonic values.

#### Compass Locator Beacon

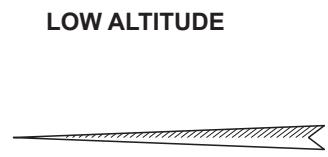
##### LOW ALTITUDE



## RADIO AIDS TO NAVIGATION (Continued)

### ILS LOCALIZER

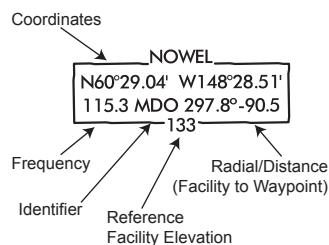
ILS Localizer Course with additional navigation function



ILS Localizer Back Course with additional navigation function

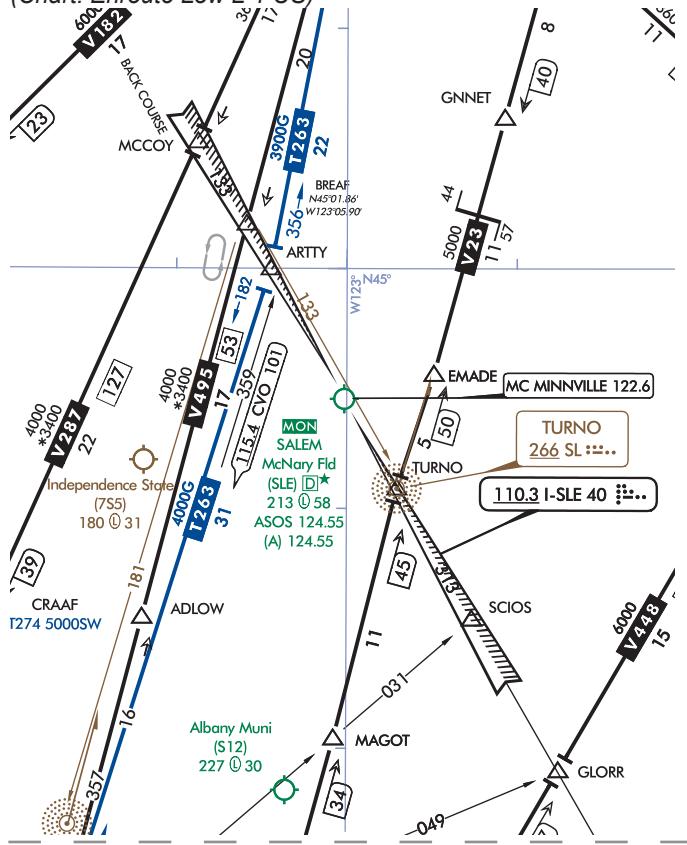


### HIGH ALTITUDE - ALASKA VOR/DME RNAV WAYPOINT DATA



### ILS Localizer Example with Back Course

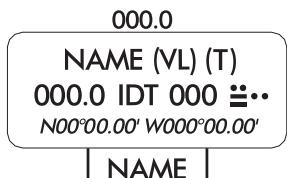
(Chart: Enroute Low L-1 US)



### NAVIGATION AND COMMUNICATION BOXES - COMMON ELEMENTS

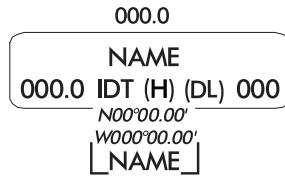
#### LOW ENROUTE CHARTS

RCO Frequencies  
NAVAID Name, SSV(s)  
FREQ, Ident, CH, Morse Code  
Latitude, Longitude  
Controlling FSS Name



#### HIGH ENROUTE CHARTS

RCO Frequencies  
NAVAID Name  
Frequency, Ident, SSV(s), Channel  
Latitude, Longitude  
Controlling FSS Name



### COMMON ELEMENTS (HIGH AND LOW CHARTS)

#### RCO Frequency

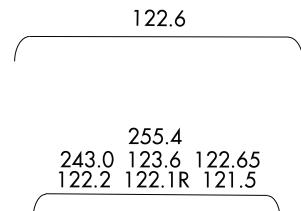
Single Frequency

Multiple Frequencies

Frequencies transmit and receive except those followed by R and T:

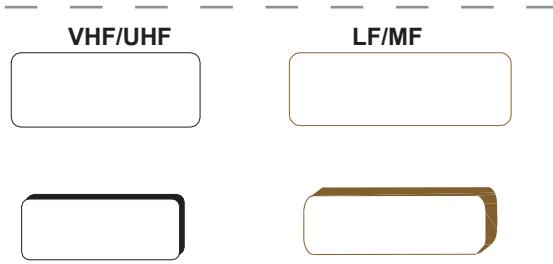
R - Receive Only

T - Transmit Only



#### NAVAID Box

Thin line NAVAID boxes without frequency(s) and FSS radio name indicates no FSS frequencies available.



Shadow NAVAID box indicates NAVAID and Flight Service Station (FSS) have same name.

## RADIO AIDS TO NAVIGATION (Continued)

### Navigation and Communication Boxes - Common Elements

#### NAVAID STANDARD SERVICE VOLUME (SSV) CLASSIFICATIONS

(VL), (T), etc. indicate SSV. See "NAVAID STANDARD SERVICE VOLUME (SSV) CLASSIFICATIONS" on page 66 or the Chart Supplement for SSV Altitude and Range Boundaries.

(T) (L) (VL) (H) (VH) (DL) (DH)

#### DISTANCE MEASURING EQUIPMENT

Facilities that operate in the "Y" mode for DME reception

(Y)

#### VOICE COMMUNICATIONS VIA NAVAID

Voice Transmitted

112.6

No Voice Transmitted

111.0

#### NAVAID SHUTDOWN STATUS

VHF/UHF

LF/MF

#### PART TIME OR ON-REQUEST

VHF/UHF

LF/MF

#### AUTOMATED WEATHER BROADCAST SERVICES

ASOS/AWOS - Automated Surface Observing Station/Automated Weather Observing Station

VHF/UHF      LF/MF

A

A

#### LATITUDE AND LONGITUDE

Latitude and Longitude coordinates are provided for those NAVAIDs that make up part of a route/airway or a holding pattern. All TACAN facilities will include geographic coordinates.

LOW ENROUTE

N00°00.00' W000°00.00'

HIGH ENROUTE

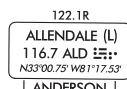
N00°00.00' W000°00.00'

### Navigation and Communication Boxes - Examples

#### LOW ENROUTE CHARTS

##### VOR

R - Receive only 122.1R



Controlling FSS Name - ANDERSON

(T) - Service Volume



Receive & Transmit on 122.35

(T) - Service Volume

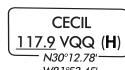
Latitude and Longitude

Controlling FSS Name - MACON



#### HIGH ENROUTE CHARTS

##### VOR



## RADIO AIDS TO NAVIGATION (Continued)

### Navigation And Communication Boxes - Examples (Continued)

LOW ENROUTE CHARTS	HIGH ENROUTE CHARTS
<b>VOR/DME</b>	
No Voice Communications (Y) Mode DME	ITTHACA 111.8 ITW (L) (DL) 55
R - Receive only 122.1R Controlling FSS Name - BUFFALO	122.1R ROCKDALE (L)(L) 112.6 RKA 73 N42°27.98' W75°14.36' [BUFFALO]
Shadow NAVAID Box FSS Associated with NAVAID	119.1 MIRABEL (L)(L) 116.7 YMX 114 N46°53.30' W74°22.54'
<b>TACAN</b>	
TACAN Channels are without voice but not underlined	SANTA ROSA (L) 63 NGS  (133.6) N30°36.91' W88°56.24'
Part Time NAVAID	PENSACOLA (L) *119 NPA  (117.2) N30°21.48' W87°16.99'
<b>VORTAC</b>	
	255.4 243.0 122.55 121.5 ALEXANDRIA (H)(H) 116.1 AEX 108 N31°15.40' W92°30.06' [DE RIDDER]
Shutdown status	BRUNSWICK (L)(L) *** NZH N43°32.41' W69°55.31'
<b>DME</b>	
DME Channel, Ident, Morse Code, VHF Frequency	MOULTRIE (L) 25 MGR  (108.8) N31°04.94' W82°48.25'
<b>NDB</b>	
A - ASOS/AWOS Available	SILVER BAY 350 BFW
Shutdown status	SHEMYA NS2°43.32' E174°03.62'
<b>NDB/DME</b>	
No Voice Communications (Y) Mode DME	122.3 CAPE LISBURNE 385 LUR 20(Y) (108.35) N68°52.28' W166°04.56' [KOTZEBUE]
Shadow NAVAID Box FSS Associated with NAVAID	123.6 ILIAMNA 411 IJ 91 (114.4) N59°44.88' W154°54.38'
<b>VOR/DME</b>	
Off Route (Greyed NAVAID Box and NAVAID)	
DME in Y Mode	109.65 ULW (L)(L) 33(Y) N42°55.65' W77°01.49'
Shadow NAVAID Box FSS Associated with NAVAID	119.1 MIRABEL 116.7 YMX (L)(L) 114 N46°53.30' W74°22.54'
<b>TACAN</b>	
Off Route	TYNDALL 64 PAM (H) (133.7) N30°04.44' W85°34.34'
Off Route - Part Time NAVAID (Greyed NAVAID Box and NAVAID)	PENSACOLA 119 NPA (L) (117.2) N30°21.48' W87°18.99'
<b>VORTAC</b>	
	122.55 ALEXANDRIA 116.1 AEX (H)(H) 108 N31°15.40' W92°30.06' [DE RIDDER]
Shutdown status	HANDLE 114.3 HLL (L) (DL) 90
<b>DME</b>	
DME Channel, Ident, VHF Frequency	DUNKIRK 109 DKK (H) (116.2)
<b>NDB</b>	
	FORT DAVIS 529 FDV N64°29.68' W165°18.91'
<b>NDB/DME</b>	
No Voice Communications (Y) Mode DME	CAPE NEWENHAM 385 EHM 18(M) (108.15) N58°39.36' W162°04.42'
Shadow NAVAID Box FSS Associated with NAVAID	ILLIAMNA 411 IJ 91 (114.4)
<b>Notes:</b> Morse Code is not shown on High NAVAID Boxes.	

## RADIO AIDS TO NAVIGATION (Continued)

### Stand Alone Flight Services and Communication Outlets

#### Flight Service Station (FSS)

Shadow NAVAID boxes indicate Flight Service Station (FSS) locations. Frequency 122.2 (Conterminous U.S.) and 121.5 and 243.0 (Alaska) are available at many FSSs and are not shown. All other frequencies are shown above the box.

Certain FSSs provide Local Airport Advisory (LAA) on 123.6.

Frequencies transmit and receive except those followed by R and T:

R - Receive Only  
T - Transmit Only

#### LOW CHARTS

##### Stand Alone FSS

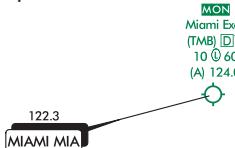


#### HIGH CHARTS

##### Stand Alone FSS



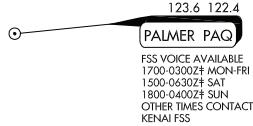
##### Stand Alone FSS Associated with an Airport



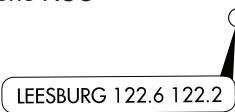
##### Stand Alone FSS Associated with an Airport



#### Part-time FSS



#### Stand Alone RCO



#### Stand Alone RCO



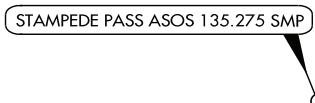
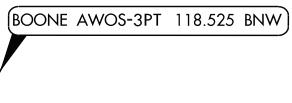
#### RCO Associated/Co-located with RCO Associated/Co-located with an Airport



### Remote Communications Outlet (RCO)

Thin line NAVAID boxes without frequencies and controlling FSS name indicate no FSS frequencies available. Frequencies positioned above the thin line boxes are remoted to the NAVAID sites. Other frequencies at the controlling FSS named are available, however altitude and terrain may determine their reception.

### Stand Alone AWOS & ASOS



## AIRSPACE INFORMATION

### Airway/Route Types

#### Low and High Enroute Airway Data:

Low Enroute Charts	
Victor Airways	<b>V0</b>
LF/MF Airway	<b>A0</b>
RNAV T Route	<b>T000</b>
GNSS Required	
RNAV TK Helicopter Route	<b>TK000</b>
GNSS Required	

Preferred Direction Victor Route	<b>V0</b>
Unusable Route Segment	

Military Training Routes (MTR)	
MTRs 5NM or less both sides of centerline	<b>IR-000</b>
MTRs greater than 5NM either or both sides of centerline	<b>VR-000</b>

Arrow indicates direction of route

See MTR tabulation for altitude range information

All IR and VR MTRs are shown except those VRs at or below 1500' AGL

CAUTION: Inset charts do not depict MTRs

#### Low and High Enroute Charts

ATS Route	<b>A0</b>	<b>A0</b>
Oceanic Route	<b>A00</b>	<b>A00</b>

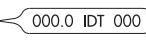
VHF/UHF Data is depicted in Black.

LF/MF Data is depicted in Brown.

RNAV Route data is depicted in Blue

High Enroute Charts	
Jet Routes	<b>J000</b>
Atlantic Routes	<b>AR0</b>
Bahama Routes	<b>BROL</b>
RNAV Q Routes	<b>Q00</b>
Alaska Q Routes require GNSS and radar surveillance. Within the CONUS, GNSS or DME/DME/IRU RNAV required, unless otherwise indicated. DME/DME/IRU aircraft require radar surveillance.	
Preferred Direction Jet Routes	<b>J0</b>
Preferred Direction RNAV Q Routes	<b>Q0</b>
Preferred Direction ATS Route	<b>R000</b>
Unusable Route Segment	

## Airspace Information (Continued)

FIXES		REPORTING FUNCTION	WAYPOINTS
VHF/UHF	LF/MF	<b>Compulsory Position Reporting</b>	RNAV
		<b>Non-Compulsory Position Reporting</b>	
N25°46.47' W76°16.28'	N29°36.00' W88°01.00'	<b>Fix or Waypoint Coordinates</b> <i>Fix Coordinates are shown for compulsory, offshore and holding fixes.</i>	N44°25.36' W64°11.00'
		<i>Waypoints Coordinates are shown when waypoint is not part of a RNAV route and when located on or beyond the boundary of the U.S. Continental Control (12 mile limit).</i>	
 — △ — 		<b>Off-set arrows indicate facility forming a fix</b> - Arrow points away from the VHF/UHF NAVAID - Arrow points towards the LF/MF NAVAID	N/A
 — △ — 		<b>Distance Measuring Equipment (DME) Fix</b> <i>Denotes DME fix (distance same as airway / route mileage)</i>	N/A
<b>VHF/UHF</b>		<b>Distance Measuring Equipment (DME) Fix</b>	RNAV
		<i>Denotes DME fix (encircled mileage shown when not otherwise obvious)</i>	N/A
 — △ —  — △ — 		<b>Example:</b> <i>First segment, 5NM; second segment 10NM; total mileage provided in encircled DME arrow.</i>	N/A
<b>VHF/UHF</b>	<b>LF/MF</b>	<b>Total Mileages between Compulsory Reporting Points or NAVAIDs</b>	RNAV
		<i>Note: All mileages are in Nautical Miles</i>	N/A
54	125	<b>MILEAGE BETWEEN OTHER FIXES, NAVAIDs AND/OR MILEAGE BREAKDOWN</b>	125
		<b>Mileage Breakdown or Computer Navigation Fix (CNF)</b> <i>Five letter identifier in parentheses indicates CNF with no ATC function</i>	N/A
 		<b>FACILITY LOCATOR BOATS</b>	N/A
 		<i>Crosshatch indicates Shutdown status of NAVAID</i>	
← 000 —	N/A	<b>RADIAL OUTBOUND FROM A VHF/UHF NAVAID</b>	N/A
N/A	— 000 →	<i>All Radials are magnetic.</i>	
N/A	N/A	<b>BEARING INBOUND TO AN LF/MF NAVAID</b>	N/A
		<i>All Bearings are magnetic.</i>	
		<b>MAGNETIC REFERENCE BEARING</b> , outbound from a NAVAID or Fix	
		<i>Note: Not shown on joint Victor/RNAV or Jet/RNAV Routes.</i>	000 →

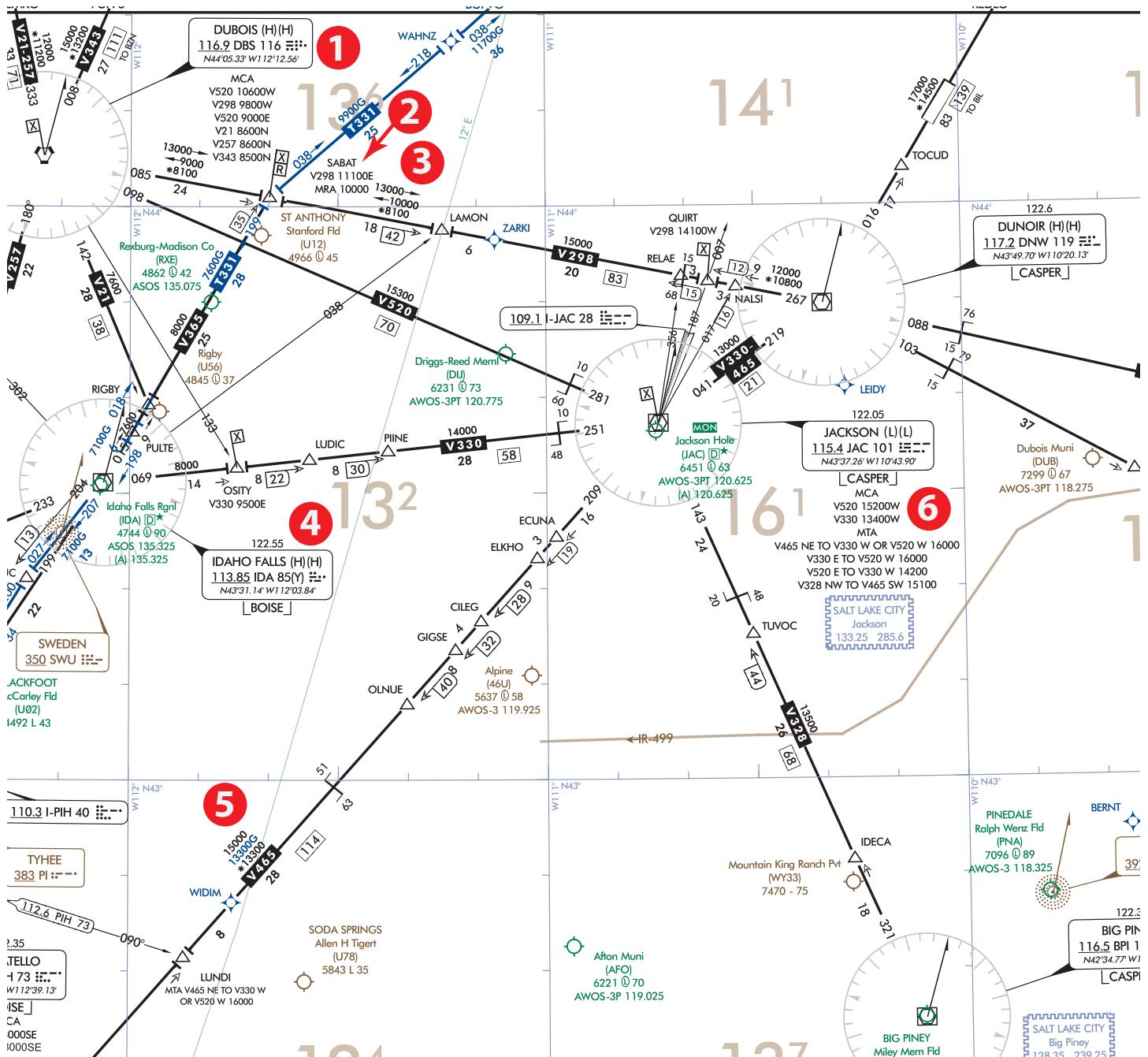
## Airspace Information (Continued)

VHF/UHF LOW CHARTS	LF/MF LOW CHARTS	MINIMUM ENROUTE ALTITUDE (MEA) All Altitudes Are MSL Unless Otherwise Noted.	RNAV LOW CHARTS
0000	0000	Directional MEAs	0000G
HIGH CHARTS	HIGH CHARTS	MEAs are shown on IFR High Altitude Charts when MEA is other than 18,000'.	HIGH CHARTS
MEA-29000	MEA-FL240		MEA for GNSS RNAV aircraft MEA-24000G
<hr/>			MEA for DME/DME/IRU RNAV aircraft MEA-24000D
<hr/>		<b>MINIMUM ENROUTE ALTITUDE (MEA) GAP</b>	N/A
		MEA is established when there is a gap in navigation signal coverage.	
<hr/>			
LOW CHARTS	LOW CHARTS	<b>Maximum Authorized Altitude (MAA)</b> All Altitudes Are MSL Unless Otherwise Noted.	LOW / HIGH CHARTS
			MAA-00000
<hr/>			
LOW / HIGH CHARTS	LOW / HIGH CHARTS	MAAs are shown on IFR High Altitude Charts when MAA is other than 45,000'.	
MAA-00000	MAA-00000		
<hr/>			
LOW CHARTS	LOW CHARTS	<b>Minimum Obstruction Clearance Altitude (MOCA)</b>	LOW CHARTS
*0000	*0000	All Altitudes Are MSL Unless Otherwise Noted.	*0000
<hr/>			
LOW CHARTS	LOW CHARTS	<b>Minimum Turning Altitude (MTA) and Minimum Crossing Altitude (MCA)</b>	LOW CHARTS
		See Low Enroute Chart Example below for examples of both MTAs and MCAs.	
<hr/>			
<hr/>			
<hr/>			
LOW / HIGH CHARTS	LOW / HIGH CHARTS	<b>MINIMUM RECEPTION ALTITUDE (MRA)</b>	N/A
<hr/>			
<b>ALTITUDE CHANGE</b> MEA, MOCA and/or MAA change at other than NAVAIDs			
<hr/>			
<b>CHANGEOVER POINT</b>			N/A
Changeover Point giving mileage to NAVAIDs (Not shown at midpoint locations.)			
<hr/>			
<b>HOLDING PATTERNS</b>			
RNAV Holding Pattern Magnetic Reference Bearing is determined by the isogonic value at the waypoint or fix.			
<hr/>			
Holding Pattern with maximum restriction airspeed 210K applies to altitudes 6000' to and including 14000'. 175K applied to all altitudes. Airspeed depicted is Indicated Airspeed (IAS)			
<hr/>			

## AIRSPACE INFORMATION (Continued)

### Enroute Chart Examples

#### Low Enroute Chart



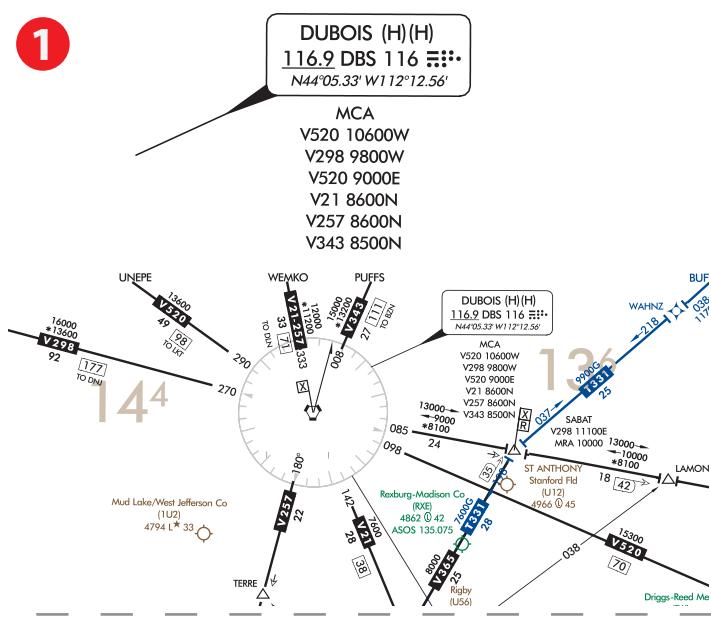
## AIRSPACE INFORMATION (Continued)

### Enroute Chart Examples

#### Low Enroute Chart (Continued)

##### Reference Number

**1**

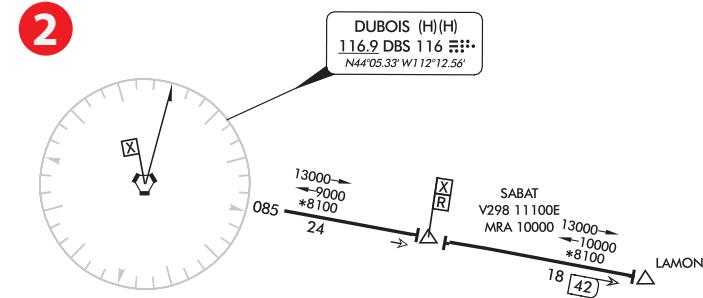


##### Description

#### Multiple MCAs at a NAVAID

V21 and V257 - MCA at DBS of 8600' traveling North  
V298 - MCA at DBS of 9800' traveling West  
V343 - MCA at DBS of 8500' traveling North  
V520 - MCA at DBS of 9000' traveling East  
V520 - MCA at DBS of 10600' traveling West

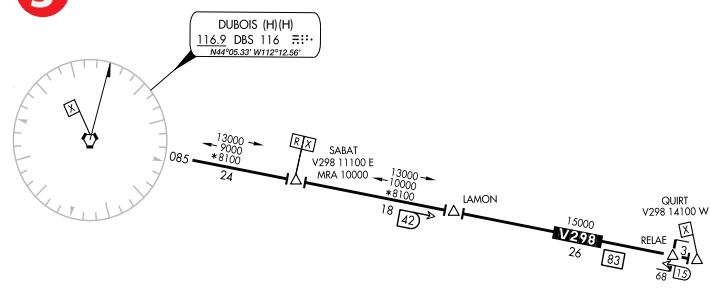
**2**



#### MCA and MRA at a Fix

MCA at SABAT on V298 of 11,100 traveling East.  
MRA at SABAT of 10000.

**3**



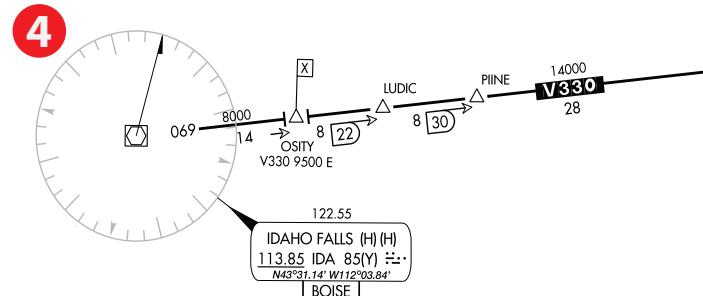
#### Example of MOCA and directional MEAs along a Victor Route

Traveling East from DBS, MEA 13,000' the first two segments, 15,000 along third segment.

Traveling West from QUIRT, MEA of 15,000' the first segment, MEA of 10,000 the second segment and MEA of 9,000 the third segment.

MOCA for DBS to SABAT and SABAT to LAMON segments of 8100

**4**



#### MCA Example

MCA at OSITY on V330. MCA of 9500' traveling East on V330 from Idaho Falls (IDA) VOR-DME.

## AIRSPACE INFORMATION (Continued)

### Enroute Chart Examples

#### Low Enroute Chart (Continued)

##### Reference Number

##### Description

5

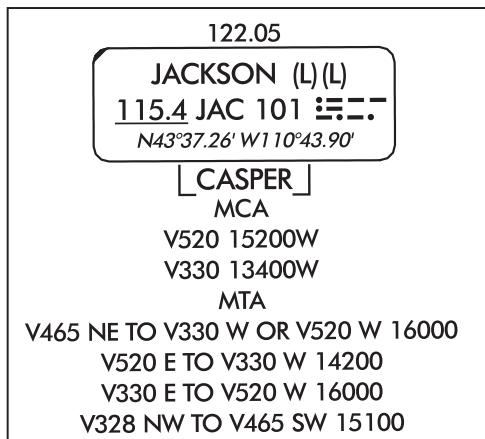


#### MEA VHF and RNAV Example

MEA for aircraft utilizing VHF NAVAID of 15000'  
MEA for aircraft utilizing RNAV of 13300'

MOCA of 13300'

6



#### MCA and MTA Example at a NAVAID

MCA for aircraft traveling West along V520 to cross JAC at 15200'  
MCA for aircraft traveling West along V330 to cross JAC at 13400'

MTA for aircraft crossing over and turning at JAC:

Aircraft traveling NE on V465 and turning to V330 on a W heading or turning to V520 on a W heading must turn at altitude of 16000' or higher

Aircraft traveling E on V520 and turning to V330 on a W heading must turn at altitude of 14200'

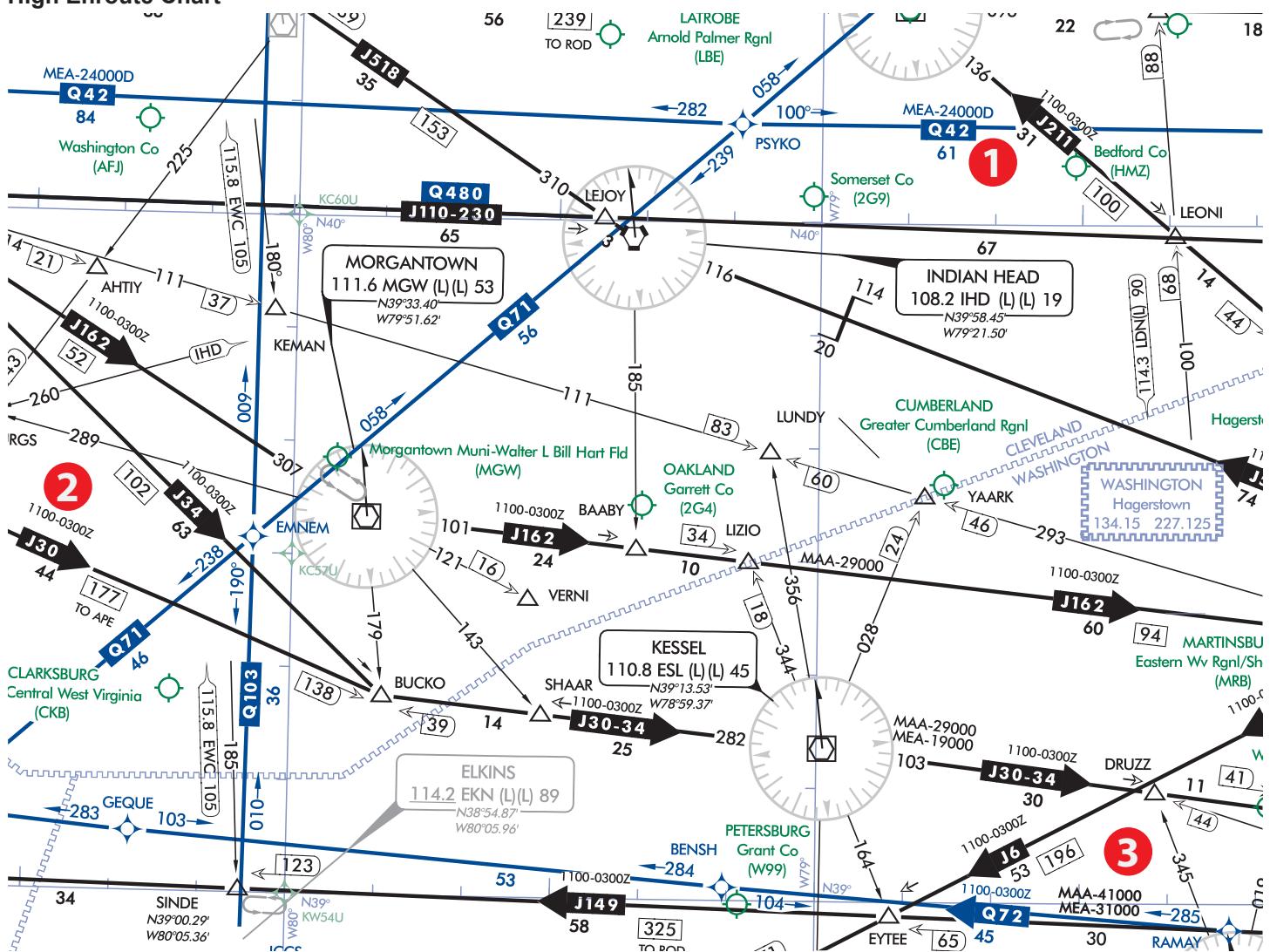
Aircraft traveling E on V330 and turning to V520 on a W heading must turn at altitude of 16000' or higher

Aircraft traveling NW on V328 and turning to V465 on a SW heading must turn at altitude of 15100' or higher.

## Airspace Information (Continued)

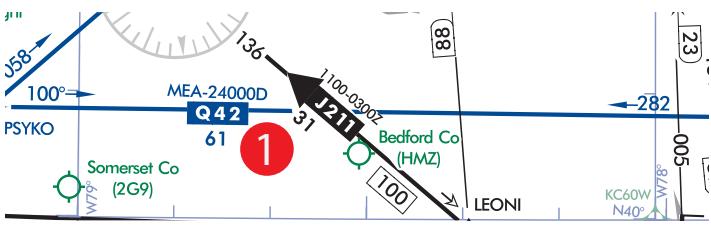
### Enroute Chart Examples

#### High Enroute Chart



FAA Chart Users' Guide - IFR Enroute Symbology

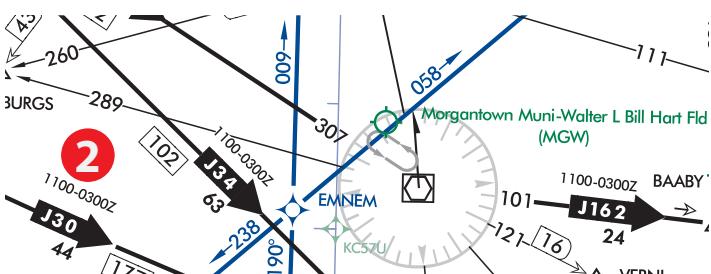
#### Reference Number



#### Description

**High RNAV Route with MEA for DME/DME/IRU RNAV Aircraft**

MEA of 24,000'



#### Preferred Directional Jet Route with Time Restrictions

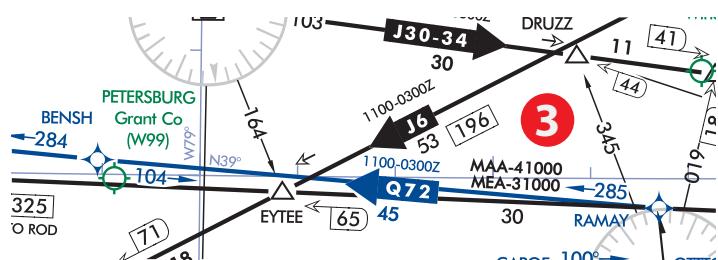
Jet Route 34 available between 1100 - 0300Z

## AIRSPACE INFORMATION (Continued)

### Enroute Chart Examples

#### High Enroute Chart (Continued)

##### Reference Number



##### Description

#### Preferred Directional Jet Route with Time Restrictions, MAA and MEA

Jet Route 149 available between 1100 - 0300Z  
MAA - 41,000'  
MEA - 31,000'

##### AIRSPACE BOUNDARIES

##### Air Defense Identification Zone (ADIZ)

##### LOW / HIGH CHARTS

CONTIGUOUS U.S. ADIZ

ALASKA ADIZ

CANADA ADIZ

##### Air Traffic Service Identification Data

##### LOW / HIGH CHARTS

CTA  
HOUSTON OCEANIC  
KZHU  
UNITD  
2500 ASAE  
NEW YORK RADIO  
129.4 2887  
5550 6577 8846 8918  
11396 13297 17907

Ceiling  
Floor  
Call Sign  
Frequency

FIR  
HOUSTON OCEANIC  
KZHU  
UNITD  
MSI  
NEW YORK RADIO  
129.4 2887  
5550 6577 8846 8918  
11396 13297 17907

Ceiling  
Floor  
Call Sign  
Frequency

##### Flight Information Regions (FIR)

##### LOW / HIGH CHARTS

TORONTO FIR CZYZ

MONTREAL FIR CZUL

TORONTO FIR CZYZ

##### Upper Information Regions (UIR)

##### Upper Control Areas (UTA)

##### HIGH ALTITUDE

MONTERREY UTA/UIR SECTOR 2 MMTY

MERIDA UTA/UIR SECTOR 1 MMID

MONTERREY UTA/UIR SECTOR 1 MATY

HOUSTON OCEANIC CTA/FIR KZHU

MONTERREY FIR/UIR MMTY

##### Control Areas (CTA)

##### LOW / HIGH CHARTS

NEW YORK OCEANIC CTA/FIR KZVY

MIAMI OCEANIC CTA/FIR KZMA

##### Adjoining CTA

##### Additional Control Areas

##### LOW ALTITUDE

CONTROL 1141L

##### HIGH ALTITUDE

CONTROL 1419 H

##### Foreign Airspace Note

NOTE: Limited chart information provided outside U.S. airspace.  
Refer to DoD (NGA) or foreign charts and flight information publications outside U.S. airspace.

## AIRSPACE INFORMATION (Continued)

### Airspace - U.S.

#### Class A

Open Area (White)

##### High Chart Only

That airspace from 18,000' MSL to and including FL 600, including the airspace overlying the waters within 12 NM of the coast of the contiguous United States and Alaska and designated offshore areas, excluding Santa Barbara Island, Farallon Island, the airspace south of latitude 25° 04'00" N, the Alaska peninsula west of longitude 160°00'00" W, and the airspace less than 1,500' AGL.

##### Controlled Airspace

That airspace from 18,000' MSL to and including FL 450, including Santa Barbara Island, Farallon Island, the Alaska peninsula west of longitude 160°00'00" W, and designated offshore areas.

#### Class B

Screened Blue with a Solid Blue Outline

##### Low Chart Only

##### Controlled Airspace



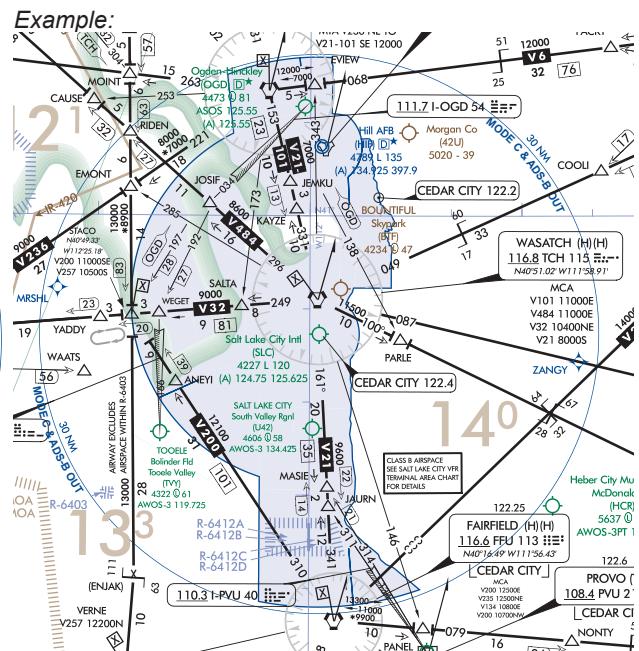
That airspace from the surface to 10,000' MSL (unless otherwise designated) surrounding the nation's busiest airports. Each Class B airspace area is individually tailored and consists of a surface area and two or more layers.

#### Mode C Area

A Solid Blue Outline

##### Low Chart Only

That airspace within 30 NM of the primary airports of Class B airspace and within 10 NM of designated airports. See Chart example above. Mode-C transponder and ADS-B Out equipment is required. (See FAR 91.215)



Example:

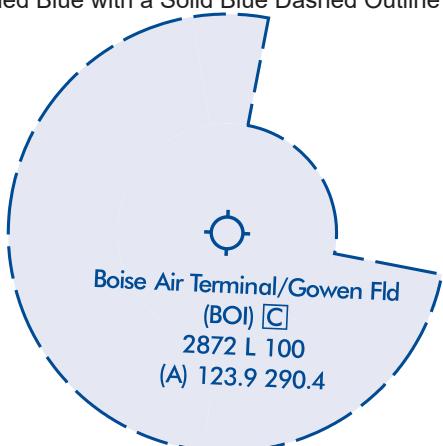
## AIRSPACE INFORMATION (Continued)

### Airspace - U.S. (Continued)

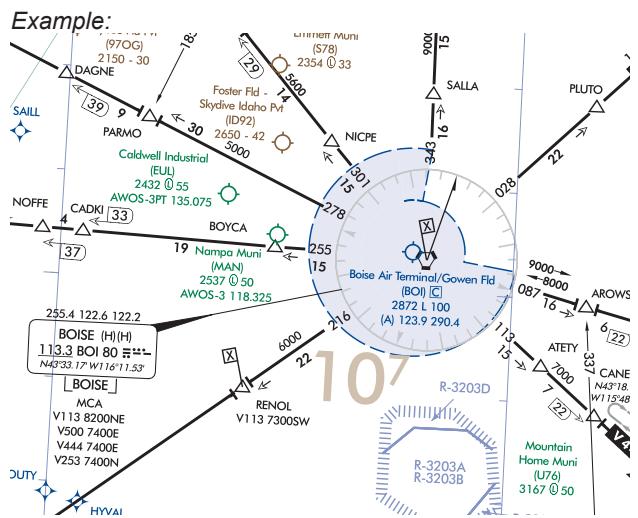
#### CLASS C Screened Blue with a Solid Blue Dashed Outline

*Low Chart Only*

*Controlled Air-space*



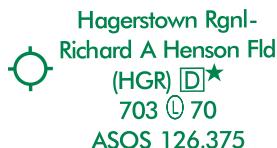
That airspace from the surface to 4,000' (unless otherwise designated) above the elevation of selected airports (charted in MSL). The normal radius of the outer limits of Class C airspace is 10NM. Class C airspace is also indicated by the letter C in a box following the airport name.



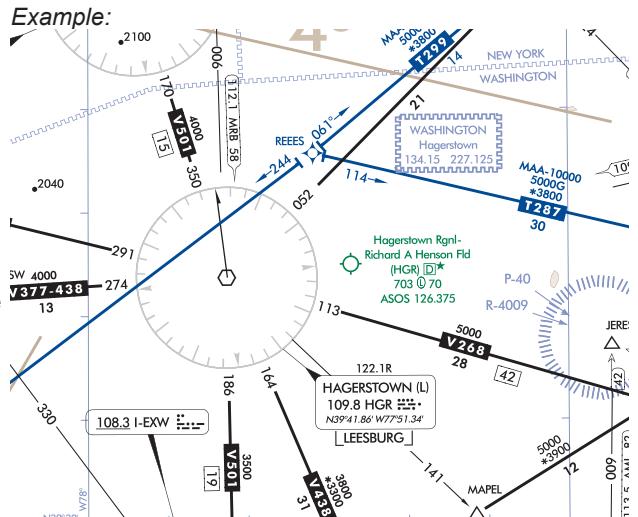
#### CLASS D Open Area (White)

*Low Chart Only*

*Controlled Air-space*



That airspace from the surface to 2,500' (unless otherwise designated) above the airport elevation (charted in MSL), surrounding those airports that have an operational control tower. Class D airspace is indicated by the letter D in a box following the airport name.



## Airspace Information (Continued)

### AIRSPACE - U.S.

#### CLASS E

Open Area (White)

*Low Chart Only*

The controlled airspace below 14,500' MSL that is not

*Controlled Air-*

*space*

Federal Airways from 1,200' AGL to but not including 18,000' MSL (unless otherwise specified).

Other designated control areas below 14,500' MSL.

Not Charted

That airspace from 14,500' MSL to but not including 18,000' MSL, including the airspace overlying the waters within 12 NM of the coast of the contiguous United States and Alaska and designated offshore areas, excluding the Alaska peninsula west of longitude 160°00'00" W, and the airspace less than 1,500' AGL.

#### CLASS G

*High and Low Chart*

Screened Brown Area



*Uncontrolled Airspace*

*Low Altitude*

*That portion of the airspace below 14,500' MSL that has not been designated as Class B, C, D or E Airspace.*

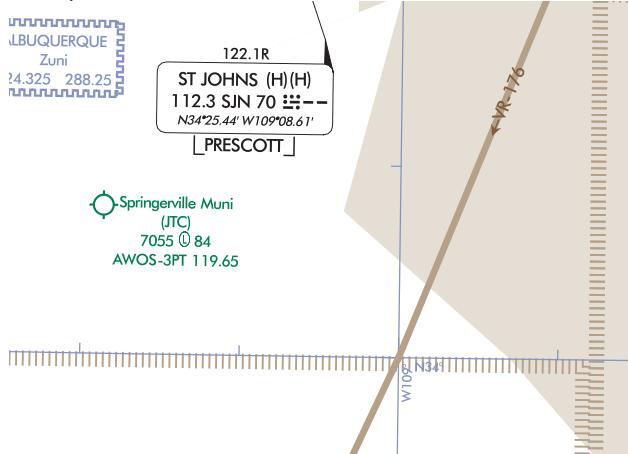
*High Altitude*

*That portion of the airspace from 18,000' MSL and above that has not been designated as Class A airspace.*

*Example:*

IBUQUERQUE  
Zuni  
14.325 288.25  
122.1R  
ST JOHNS (H)(H)  
112.3 SJN 70   
N34°25.44' W109°08.61'  
PREScott

Springerville Muni  
(JTC)  
7055 ① 84  
AWOS-3PT 119.65

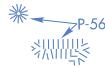


## AIRSPACE INFORMATION (Continued)

### Special Use Airspace - U.S.

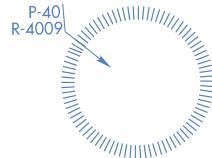
Low and High Charts      P - Prohibited Area

Example: P-56 -  
Washington DC, Area A-1 Chart



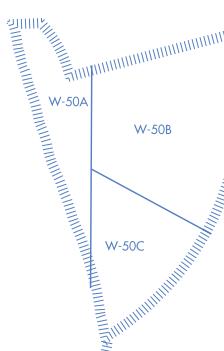
R - Restricted Area

Example: P-40 and R-4009 -  
Washington DC, Area A-1 Chart



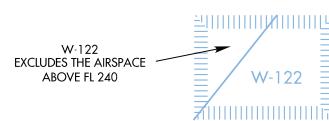
W - Warning Area

Example: W-50



See Airspace Tabulation on each chart for complete documentation information on:

*Area Identification  
Effective Altitude  
Operating Times  
Controlling Agency Voice Call*



Low Charts Only

A - Alert Area

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



MOA - Military Operations Area

See Airspace Tabulation on each chart for complete documentation information on:

*Area Identification  
Effective Altitude  
Operating Times  
Controlling Agency Voice Call*



## AIRSPACE INFORMATION (Continued)

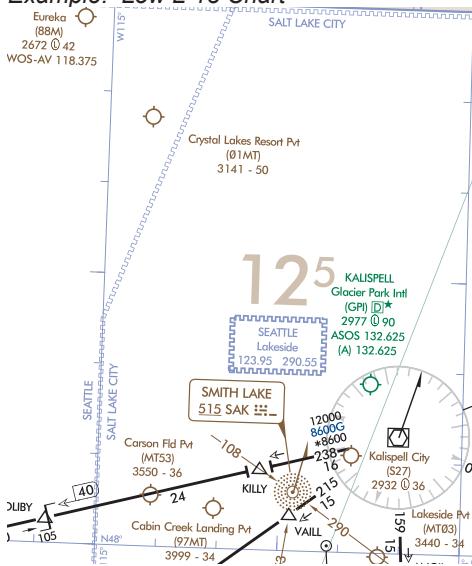
### Off Route Obstruction Clearance Altitude (OROCA)

**Low Charts Only** OROCA is computed similarly to the Maximum Elevation Figure (MEF) found on Visual charts except that it provides an additional vertical buffer of 1,000 feet in designated non-mountainous areas and a 2,000 foot vertical buffer in designated mountainous areas within the United States.

Example: 12,500 feet

**12<sup>5</sup>**

### Example: Low L-13 Chart



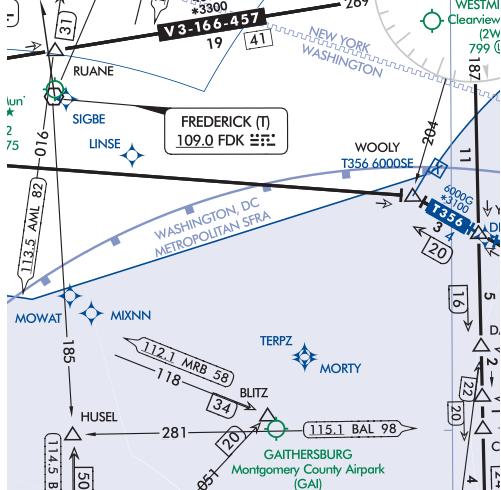
### Special Flight Rules Area (SFRA)

Low and High Charts

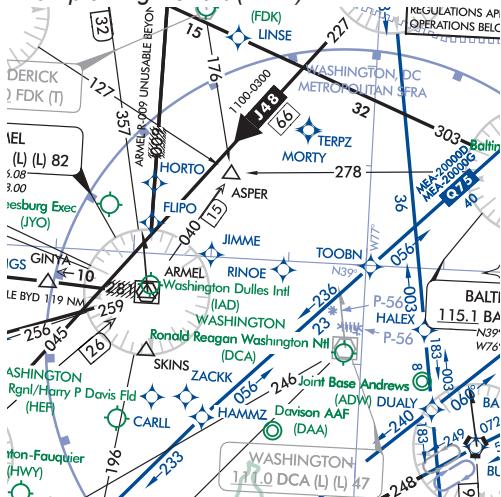
SFRA Symbology



### Example: Low Chart (Washington Area Chart)



### Example: High Chart (H-12)



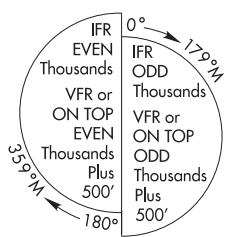
## NAVIGATIONAL AND PROCEDURAL INFORMATION

### Cruising Altitudes - Low Charts - U.S. Only

IFR outside controlled airspace.

IFR within controlled airspace as assigned by ATC.

ALL courses are magnetic.



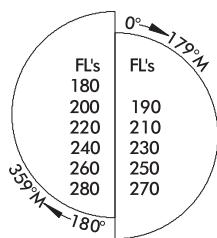
VFR above 3000' AGL unless otherwise authorized by ATC.

### Cruising Altitudes - High Charts - U.S. Only

IFR within controlled airspace as assigned by ATC

All courses are magnetic.

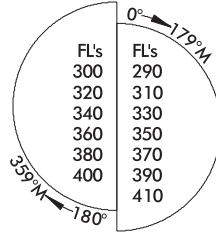
#### 18,000' MSL to FL280



VFR or VFR On Top add 500'

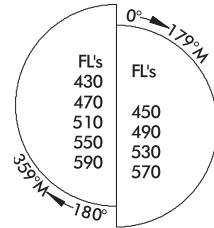
No VFR flights within Class A Airspace above 3000' AGL unless otherwise authorized

#### RVSM Levels FL290 to FL410



No VFR or VFR On Top authorized above FL285 in RVSM airspace.

#### FL430 and above



## Navigational and Procedural Information (Continued)

<b>ISOGONIC LINE AND VALUE</b>	<b>LOW/HIGH CHARTS</b>	<b>TIME ZONE</b>
		<i>All time is Coordinated Universal Time (UTC)</i>
<b>ENLARGEMENT AREA</b>		Mountain Std +7 = UTC  Central Std +6 = UTC
		<i>During periods of Daylights Savings Time (DT), effective hours will be one hour earlier than shown. All states observe DT except Arizona and Hawaii</i>
<b>MORSE CODE</b>	<b>MATCH MARK</b>	<b>LOW/HIGH CHARTS</b>
		

A --	F ....	K ---	P .....	U ...	1 .....-	6 -----
B ---	G -..	L ...	Q -...-	V ....	2 .....-	7 -----
C -..	H ...	M --	R ...	W ....	3 .....-	8 -----
D -..	I ..	N -.	S ...	X ....	4 .....-	9 -----
E .	J ....	O ---	T -	Y ....	5 .....-	0 -----
Z ---						

## CULTURE

### Boundaries

International

#### LOW/HIGH ALTITUDE

 (Not shown when coincident with ARTCC or FIR)

U.S./Russia Maritime Line

#### LOW/HIGH ALTITUDE



## HYDROGRAPHY

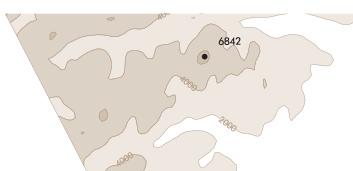
### SHORELINES



## TOPOGRAPHY

### TERRAIN

Area Charts



### Date Line

#### LOW/HIGH ALTITUDE

 INTERNATIONAL DATELINE

 SUNDAY  
MONDAY



# **U.S. TERMINAL PROCEDURES PUBLICATION**

The U.S. Terminal Procedures Publication (TPPs) includes the Instrument Approach Procedures (IAPs), Departure Procedures (DPs) charts, Standard Terminal Arrival (STAR) charts, Charted Visual Flight Procedure (CVFP) charts, and Airport Diagrams. Also included are Takeoff Minimums, (Obstacle) Departure Procedures, Diverse Vector Area (RADAR Vectors), RADAR and Alternate Minimum textual procedures.

## **EXPLANATION OF TPP TERMS AND SYMBOLS**

The information and examples in this section are based primarily on the IFR (Instrument Flight Rules) Terminal Procedures Publication (TPP). The publication legends list aeronautical symbols with a brief description of what each symbol depicts. This section will provide more detailed information of some of the symbols and how they are used on TPP charts.

FAA Terminal charts are prepared in accordance with specifications of the Interagency Air Committee (IAC) and their supporting technical groups for the purpose of standardization, which are approved by representatives of the Federal Aviation Administration (FAA), and the Department of Defense (DoD).

The Terminal Procedure Publication is made up of the following charts:

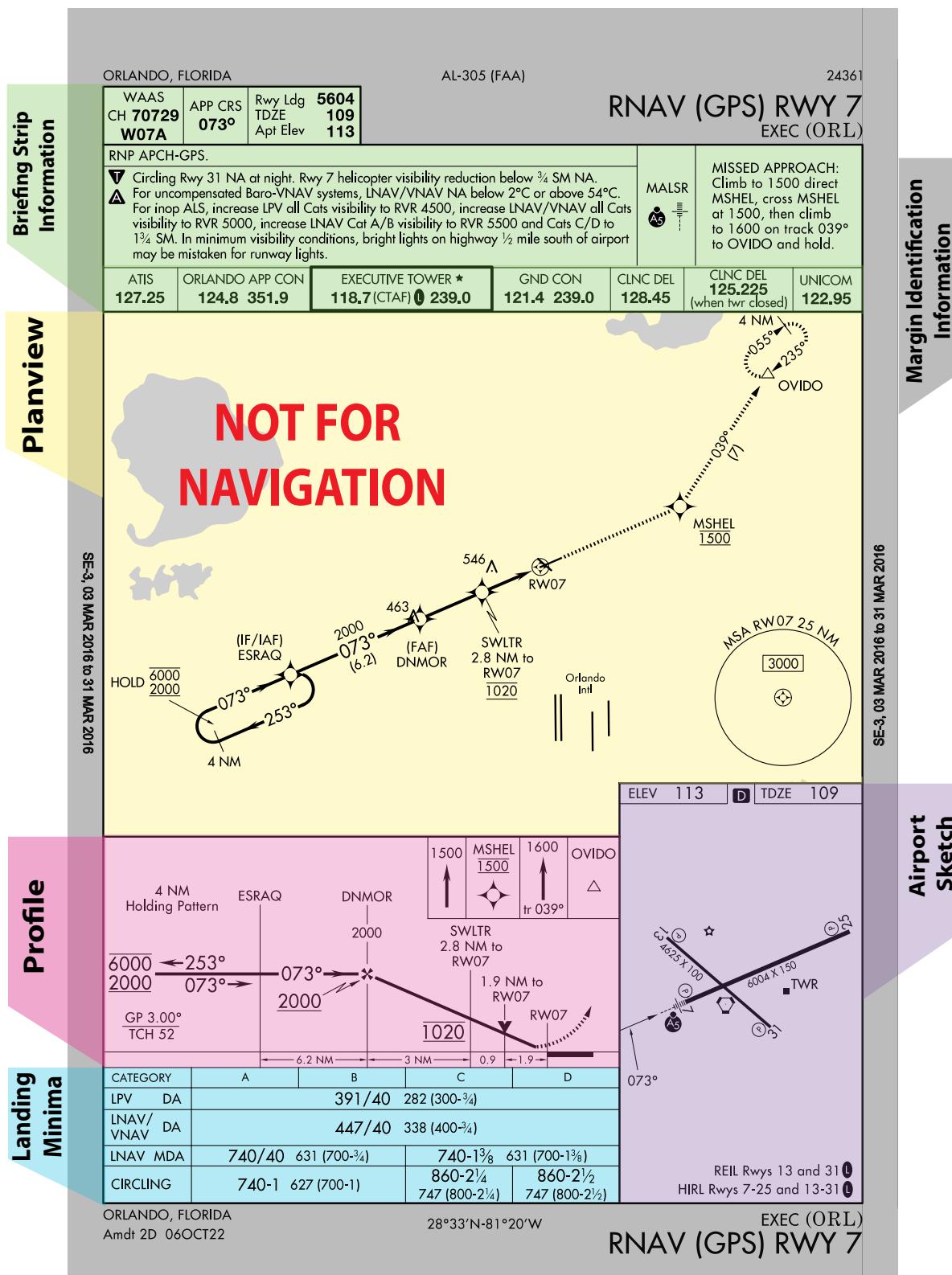
- Instrument Approach Procedure (IAP) Charts
- Airport Diagrams
- Departure Procedures (DP)
- Standard Terminal Arrival (STAR) Charts
- Charted Visual Flight Procedure (CVFP) Charts

# INSTRUMENT APPROACH PROCEDURE CHART

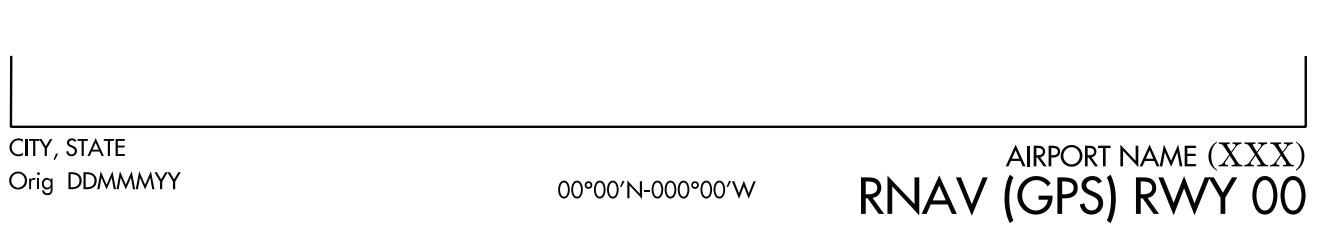
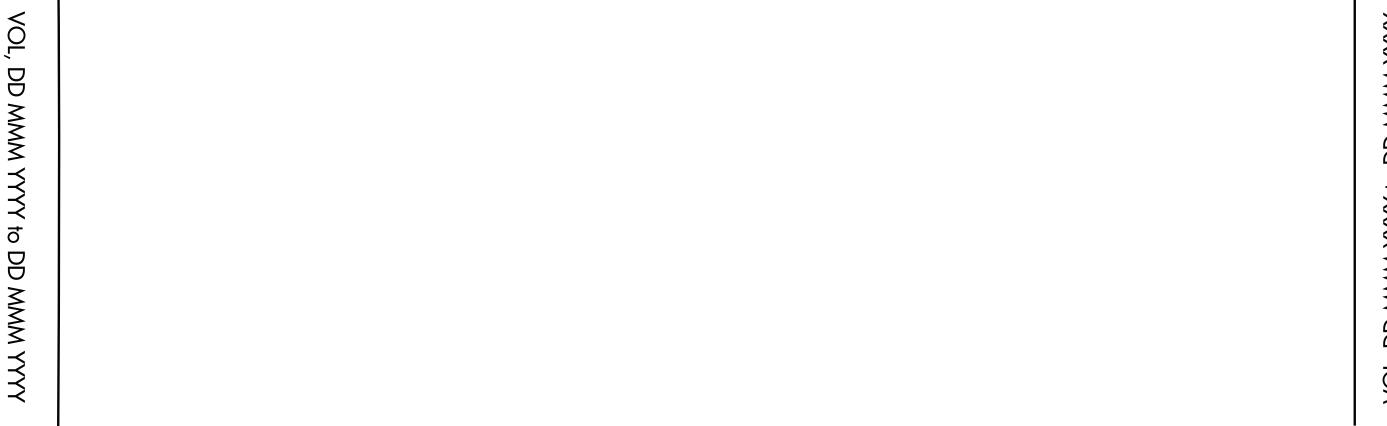
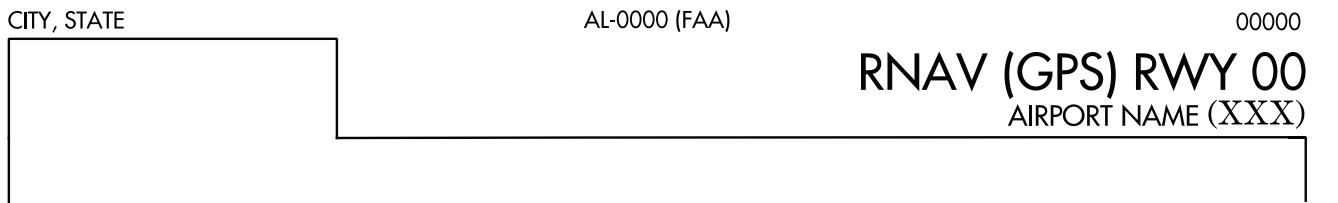
The IAPs (charts) are divided into various sections:

Margin Identification Information  
Briefing Strip Information  
Planview  
Missed Approach Information

Profile View  
Landing Minimums  
Airport Sketch



## Margin Identification Information



The margin identification at the top, bottom, and sides of the chart provides information about the airport location, procedure identification, and chart currency. The charts are organized by city first, then airport name and state, with the exception of military charts, which are organized by airport name. Going from the top of the chart, reading from left to right, and going down the chart, Margin Identification Information is organized in the following way.

The hash marks along the top and bottom borders of military Instrument Approach Charts indicate that the procedure was designed using High Altitude criteria contained in FAA Order 8260.3. These procedures are designed to support high performance military aircraft operations and are not intended for civilian use.



**Top Margin Information:**

The city and state with which the airport is associated are located on both the top and bottom margins.

At the center of the top margin is the FAA numbering system. This Approach and Landing (AL) number is followed by the organization responsible for the procedure in parentheses, e.g., AL-18 (FAA). Military procedures do not show an AL number, but do show the appropriate authority for the procedure, e.g., (USAF).

WAAS CH 56239 W34B	APP CRS 326°	Rwy Ldg TDZE Apt Elev	3715 182 192
--------------------------	-----------------	-----------------------------	--------------------

**RNAV (GPS) RWY 34L**  
MANASSAS RGNL/HARRY P DAVIS FLD (HEF)

The procedure title is located on both the top and bottom margins. It is derived from the type of navigational facility that is providing the final approach course guidance. The title is abbreviated, e.g. ILS, RNAV, NDB, etc. For airports with parallel runways and simultaneous approach procedures, "L", "R" or "C" follows the runway number to distinguish between left, right, and center runways.

The airport name is shown on both the top and bottom margins below the procedure title. The airport identifier is shown in parentheses following the airport name. Civil and joint-use airports outside the contiguous United States will be shown with the FAA airport location identifier followed by the ICAO location indicator. Military airports that are not joint-use will be shown with only the ICAO location indicator.

The Date of Latest Revision is shown on the top margin above the procedure title. The Date of Latest Revision identifies the Julian date the chart was last revised for any reason. The first two digits indicate the year, the last three digits indicate the day of the year (001 to 365/6).

WASHINGTON, DC			
WAAS CH 56239 W34B	APP CRS 326°	Rwy Ldg TDZE Apt Elev	3715 182 192

AL-5326 (FAA)

15344

**RNAV (GPS) RWY 34L**  
MANASSAS RGNL/HARRY P DAVIS FLD (HEF)

**15344**  
Year|Day of Year

**Side Margin Information:**

The side margins show the volume identification, i.e. SW-3, followed by the current issue date and the next issue date, e.g. SW-3, 21 JUL 2016 to 15 SEP 2016.

**Bottom Margin Information:**

The FAA Procedure Amendment Number, located on the left bottom margin below the City, State, represents the most current amendment of a given procedure. The Procedure Amendment Effective Date represents the AIRAC cycle date on which the procedure amendment was incorporated into the chart. Updates to the amendment number and effective date represent procedural/criteria revisions to the charted procedure, e.g., course, fix, altitude, minima, etc.

Example: Original Procedure Date

WASHINGTON, DC	MANASSAS RGNL/HARRY P DAVIS FLD (HEF)
Orig 10DEC15	38°43'N-77°31'W

**RNAV (GPS) RWY 34L**

Example: Amendment Procedure Date

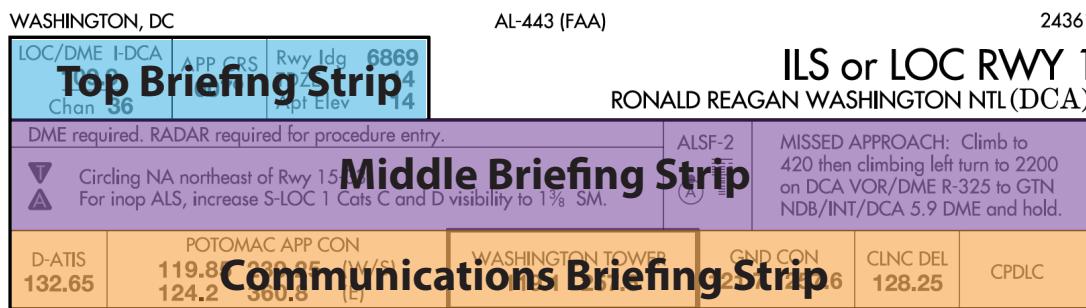
WASHINGTON D.C.	MANASSAS RGNL/HARRY P DAVIS FLD (HEF)
Amdt 1B 28MAY15	38°43'N-77°31'W

**RNAV (GPS) RWY 16R**

The coordinates for the airport reference point are located at the center of the bottom margin.

## BRIEFING STRIP INFORMATION

At the top of every TPP is the Briefing Strip that consists of three stacked strips of information immediately above the plan-view. Information varies depending upon the type of procedure.



### Top Briefing Strip

The top briefing strip contains procedural information in three separate boxes, in the following sequence from left to right:



- Box 1: Primary Procedure Navigation Information:** The primary navigation type (VOR, LOC, NDB, RNAV, etc.) with its identifier and frequency/channel. If applicable, WAAS, the WAAS Channel Number, and the WAAS Reference Path indicator are shown stacked top to bottom. If the primary navigation type is GBAS, then the following information is shown, stacked top to bottom: GBAS, CH NNNN, RPI XXXX. If there is not a primary Navigation Box required, the first box is removed.
- Box 2: Final Approach Course Information.** The inbound Approach Course (APP CRS) is shown.
- Box 3: Runway Landing Information:** Stacked top to bottom, the runway landing distance (Rwy Ldg), the Touchdown Zone Elevation (TDZE), and the Airport Elevation (Apt Elev) are shown. Runway landing distance is determined by comparing the total runway length with the displaced threshold accounted for against the published Declared Distance Landing Distance Available (LDA). The shortest of these lengths, either the published Declared Distance LDA or the total runway length (minus displaced threshold) on the approach end of the runway, will be charted.

### Top Briefing Strip Examples:

Ground based NAVAID:

DENVER, COLORADO				16147
LOC/DME I-DZG 111.55 Chan 52(Y)	APP CRS 082°	Rwy Ldg TDZE Apt Elev	12000 5352 5434	ILS or LOC RWY 7 DENVER INTL (DEN)

RNAV-WAAS:

DENVER, COLORADO				16147
WAAS CH 82628 W16B	APP CRS 173°	Rwy Ldg TDZE Apt Elev	16000 5326 5434	RNAV (GPS) Y RWY 16R DENVER INTL (DEN)

GBAS:

NEWARK, NEW JERSEY

GBAS CH <b>22727</b> <b>G04A</b>	APP CRS <b>039°</b>	Rwy Ldg <b>8460</b> TDZE <b>10</b> Apt Elev <b>17</b>
--	------------------------	---

AL-285 (FAA)

18256

**GLS RWY 4L**  
NEWARK LIBERTY INTL (EWR)

No Primary NAVAID box:

DENVER, COLORADO

APP CRS <b>173°</b>	Rwy Ldg <b>12000</b> TDZE <b>5339</b> Apt Elev <b>5434</b>
------------------------	--

16147

**RNAV (RNP) Z RWY 17L**  
DENVER INTL (DEN)

Circling Approach:

ROANOKE, VIRGINIA

VOR ODR <b>114.9</b>	APP CRS <b>236°</b>	Rwy Ldg <b>N/A</b> TDZE <b>N/A</b> Apt Elev <b>1175</b>
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AL-349 (FAA)

16203

**VOR/DME-A**  
ROANOKE-BLACKSBURG RGNL/WOODRUM FLD (ROA)

Sidestep Procedure:

LOS ANGELES, CALIFORNIA

LOC/DME I-OSS <b>108.5</b> Chan <b>22</b>	APP CRS <b>251°</b>	Rwy Ldg <b>24R</b> <b>8925</b> <b>9483</b> TDZE <b>120</b> <b>121</b> Apt Elev <b>126</b> <b>126</b>
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AL-237 (FAA)

16315

**ILS or LOC RWY 24R**  
LOS ANGELES INTL (LAX)**Middle Briefing Strip**

The middle briefing strip may contain information in up to three separate boxes, when available, in the following sequence from left to right:

1

2

3

<b>NOTES BOX</b>	<b>APPROACH LIGHTING SYSTEM</b>	<b>MISSED APPROACH PROCEDURE TEXT BOX</b>
------------------	---	---

- Box 1: Notes Box:** contains procedure notes, Equipment/Requirements Notes box and Takeoff, Alternate, RADAR, WAAS, and/or Cold Weather indicators (details provided below under Notes Box).
- Box 2: Approach Lighting System Box (when applicable):** shows the approach lighting system name and charting icon. Multiple approach lighting systems may be shown for approaches that have straight-in minimums for parallel runways.
- Box 3: Missed Approach Procedure Text Box:** The full textual description of the missed approach procedure is provided here.

## Notes Box

### Procedure Equipment Requirements Notes Box

Performance-Based Navigation (PBN) Requirements and ground-based Equipment Requirements are displayed in separate, standardized notes boxes. For procedures with PBN elements, the PBN box contains the procedure's navigation specification(s). If required, specific sensors or infrastructure needed for the navigation solution, additional or advanced functional requirements, and the minimum Required Navigation Performance (RNP) value and any amplifying remarks will also be included. Items listed in this PBN box are REQUIRED. The separate Equipment Requirements Box will list ground-based equipment requirements.

RADAR required for procedure entry.
▼ Simultaneous approach authorized with Rwy 21L. # RVR 1800 authorized with use of FD or AP or HUD to DA.

On procedures with both PBN elements and ground-based equipment requirements, the PBN requirements box is listed first.

PBN Requirements Box	From WINRZ, LBGE: RNAV-1 GPS, RNAV-1 GPS from MAP to YARKU.
Equipment Requirements Box	DME required for LOC only.
Standard Procedure Notes Box	▼ Circling to Rwy 25 NA at night. #For inop MALSR increase S-ILS 16R all cats visibility to 2½ SM.

### Remote Altimeter Airport Notes

Approach minimums are based on the local altimeter setting for that airport unless annotated otherwise. When more than one altimeter source is authorized, and the minima are different, they will be shown by separate lines in the approach minima box or as a note in the briefing strip; e.g., use MHK altimeter setting; when not available use SLN altimeter setting and increase all MDAs 40 feet. The altimeter source location is referenced by the FAA airport identifier. An airport outside the contiguous U.S. will use both the FAA and ICAO identifiers. Until all charts reference the airport identifier, the notes may contain altimeter sources referenced by city name, city and state, or airport name.

### Notes Symbols

Several different symbols may appear within the Notes Box:

- ▼ An entry is published in the Takeoff Minimums, (Obstacle) Departure Procedures, and Diverse Vector Area (Radar Vectors) section of the TPP.
- ▲ Non-standard IFR alternate minimums exist. Refer to IFR Alternate Airport Minimums section of the TPP.
- ▲ NA The IAP may not be used as an alternate due to unmonitored facility, absence of weather reporting service, or lack of adequate navigation coverage. IAPs designated with this symbol are not listed in the IFR Alternate Minimums section of the TPP.
- WAAS (Wide Area Augmentation System)
- 12°C Cold Temperature Airport

The negative ■ within a black square box symbol shown in the Notes section below any "A" or "T" Symbol indicates that outages of the WAAS (Wide Area Augmentation System) vertical guidance may occur daily at this location due to initial system limitations. WAAS NOTAMs for vertical outages are not provided for this approach. Use LNAV minima for flight planning at these locations, whether as a destination or alternate. For flight operations at these locations, when the WAAS avionics indicate that LNAV/VNAV or LPV service is available, then vertical guidance may be used to complete the approach using the displayed level of service. Should an outage occur during the procedure, reversion to LNAV minima may be required.

When  -12°C appears in the Notes section below all other symbols it indicates a cold temperature altitude correction is required at that airport when the reported temperature is at or below the published temperature. Advise ATC with altitude correction. Advising ATC with altitude corrections is not required in the final segment. See Aeronautical Information Manual (AIM), Chapter 7, for guidance and additional information. For a complete list of cold temperature airports, see [https://aeronav.faa.gov/d-tpp/Cold\\_Temp\\_Airports.pdf](https://aeronav.faa.gov/d-tpp/Cold_Temp_Airports.pdf).

When "ASR", "PAR" or "ASR/PAR" appear in the Note section immediately below the "T" and "A" symbols it indicates there are published Radar Instrument Approach Minimums. Where radar is approved for approach control service, it is used not only for radar approaches (Airport Surveillance Radar [ASR] and Precision Approach Radar [PAR]) but is also used to provide vectors in conjunction with published non-radar approaches based on radio NAVAIDs (ILS, VOR, NDB, TACAN). Radar vectors can provide course guidance and expedite traffic to the final approach course of any established IAP or to the traffic pattern for a visual approach.

### Bottom Briefing Strip (Communications Information)

The communications briefing strip contains communication information when available, in separate boxes, listed from left to right in the order that they would be used during arrival with the tower frequency box bolded:

ATIS XXXXX	APP CON XXXX XXXX	TOWER <b>XXXX XXXX</b>	GND CON XXXXX	CLNC DEL XXXXX	UNICOM XXXXX
---------------	----------------------	---------------------------	------------------	-------------------	-----------------

- ATIS, D-ATIS, AFIS (AK Only) or ASOS/AWOS frequencies (when available, ATIS or AFIS will be the only local weather frequency/s published)
- The primary Approach Control (APP CON) name and frequencies; when the primary approach service is provided by other than Approach Control, e.g. FSS (Radio), Tower, Center, the appropriate air traffic facility call name is provided
- The Control Tower (TOWER) name and frequencies, to include Precision Radar Monitoring (PRM) and frequency
- Ground Control (GND CON) frequencies
- Clearance Delivery (CLNC DEL) frequencies; where a Control Tower does not exist or is part-time, a remoted CLNC DEL may be listed.
- Ground Communications Outlet (GCO) frequency
- Common Traffic Advisory Frequency (CTAF), shown in parentheses when shares a frequency, e.g. UNICOM 122.8 (CTAF)
- UNICOM or AUNICOM frequency
- Controller Pilot Data Link Communication (CPDLC)

Note: Part-time operations will be annotated with a star. Check Chart Supplement for times of operation.

### PLANVIEW

The planview of the IAP charts provides an overhead view of the entire instrument approach procedure.

The data on the planview is shown to scale, unless concentric rings, scale breaks or an inset have been used.

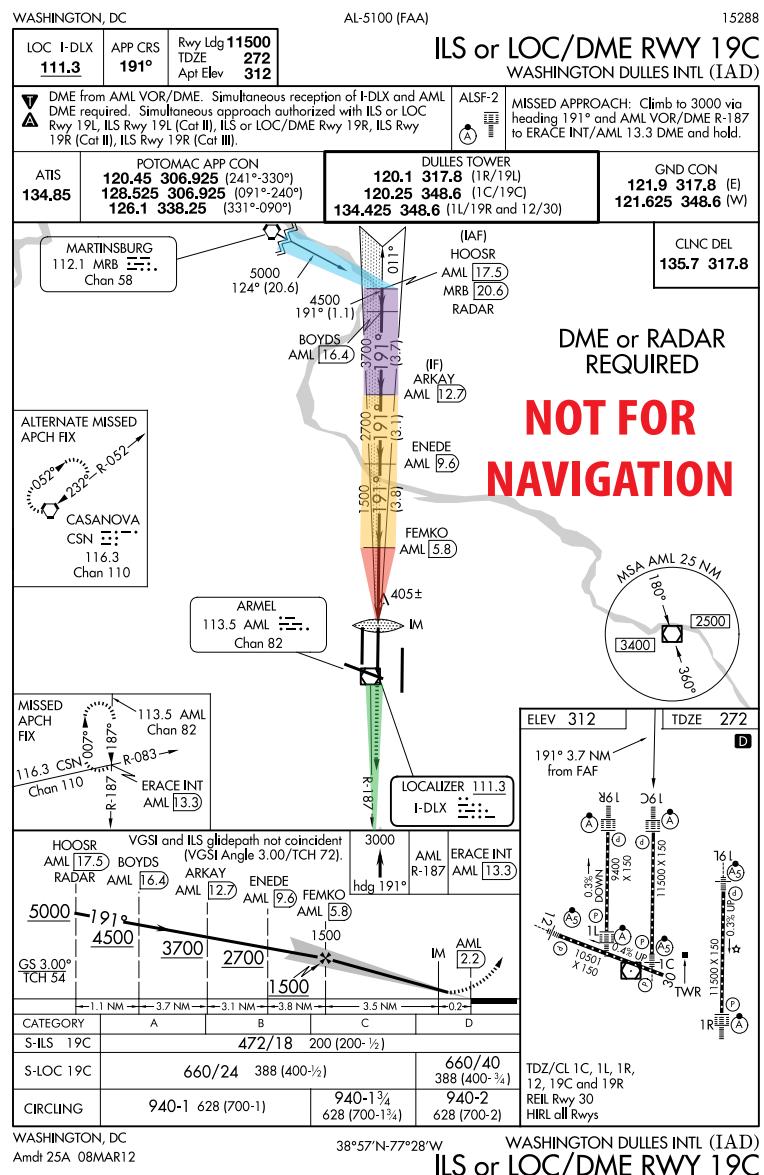
## Planview Items

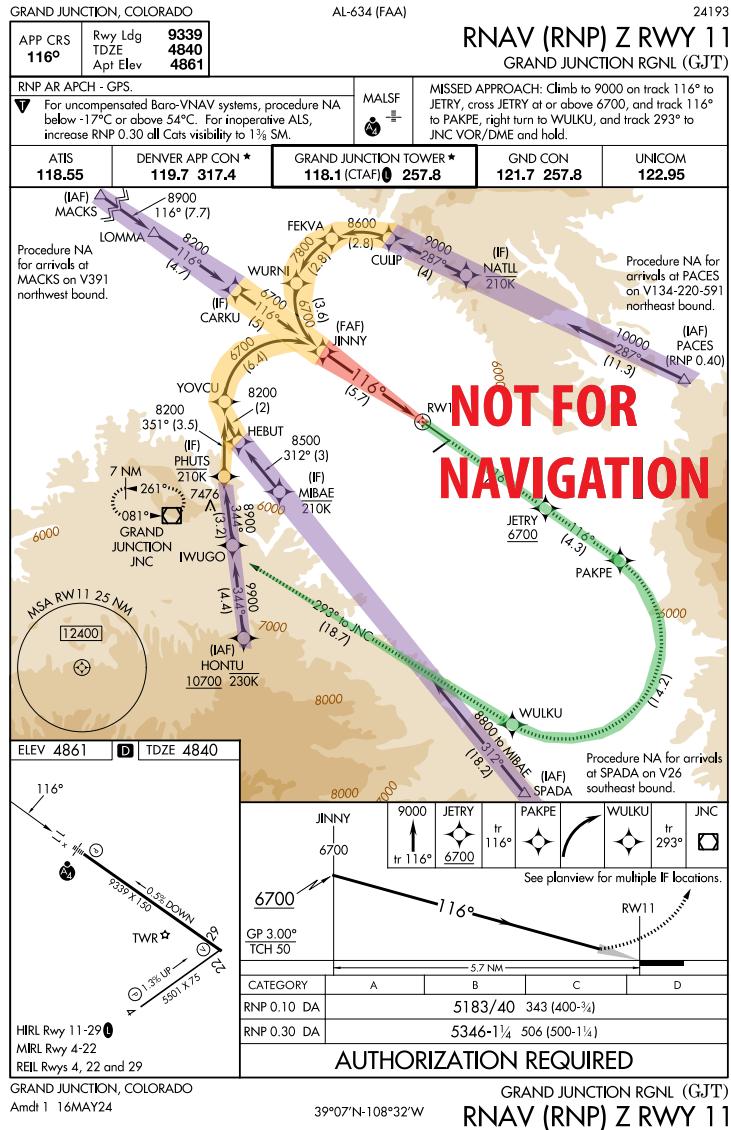
Approach Segments  
NAVAIDs  
Area Navigation (RNAV) Waypoints  
Restrictive Airspeeds  
Restrictive Altitudes  
Holding Patterns and Procedure Turns  
Airports  
Relief (Contours)

Hydrography  
International Boundary  
Obstacles (Man-made, Terrain and Vegetation)  
Special Use Airspace  
Minimum Safe Altitude  
Terminal Arrival Areas  
Helicopter (Copter) Procedures

## Approach Segments

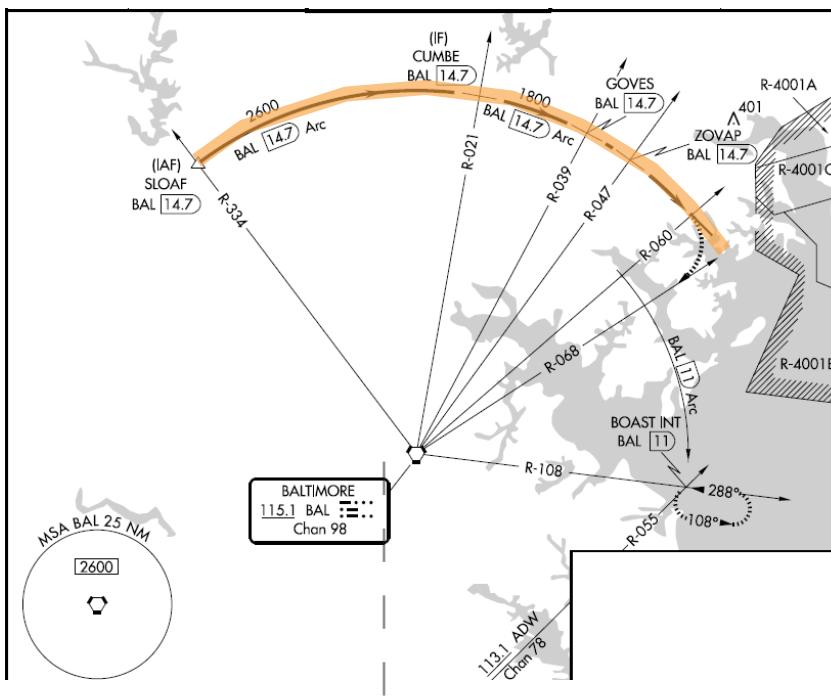
The planview includes a graphical depiction of procedure entry through missed approach.





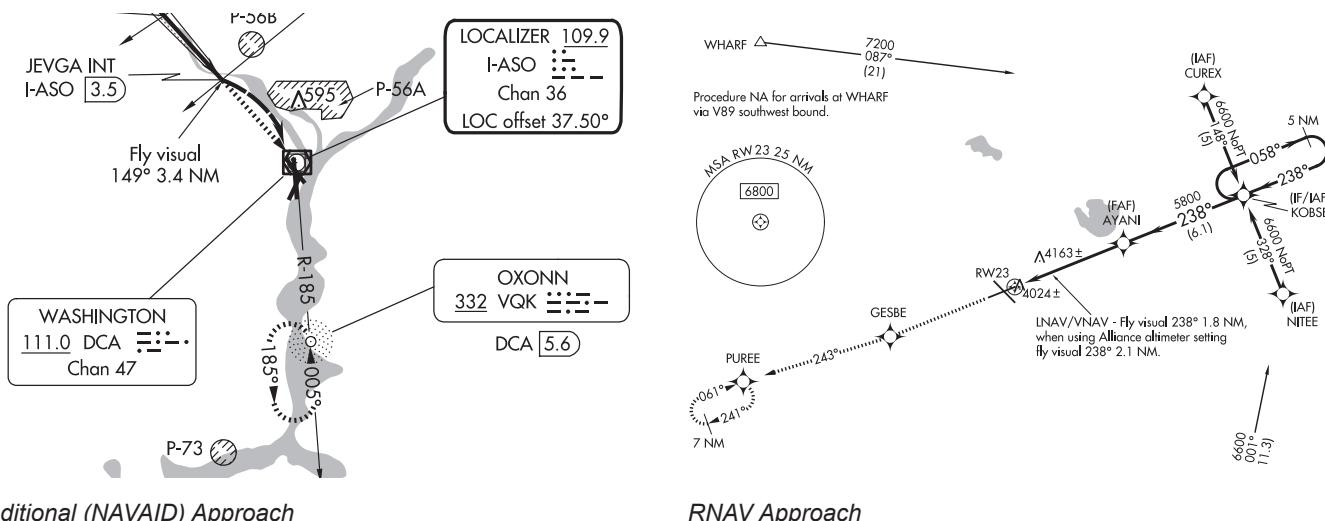
### Complex IAP Example with RF Legs

- **Feeder Routes** (highlighted in blue - See Simple IAP Example on previous page) may be used to provide a transition from the enroute structure to the IAF.
- **Initial Approach** (highlighted in purple in examples above) is the segment between the initial approach fix (IAF) and the intermediate fix (IF) or the point where the aircraft is established on the intermediate course or final approach course.
- **Intermediate Approach** (highlighted in yellow in examples above) is the segment between the intermediate fix or point and the final approach fix.
- **Final Approach Course** (highlighted in red in the examples above) is the segment between the final approach fix or point and the runway, airport, or missed approach point.
- **Missed Approach** (highlighted in green in the example above) begins at the MAP and continues until the designated fix or waypoint. The missed approach track is shown as a hash marked line in the planview. If any portion of the missed approach procedure track falls outside of the area of the planview it will be shown in a separate box in the planview.
- **DME arcs or Radius-to-Fix legs (RF)** are shown as smooth arcs from a designated start point to a designated terminus. RF legs depict the altitude and distance. In order to differentiate RF legs from Track to Fix (TF) legs on IAPs that contain one or more RF legs, the course value will always be shown on all TF legs.



- Visual segment** - Instrument approach procedures, including Copter approach procedures, that terminate or have missed approaches prior to the airport/heliport, and are authorized to proceed visually, will depict the visual flight path by a dashed line symbol from the missed approach point to the airport.

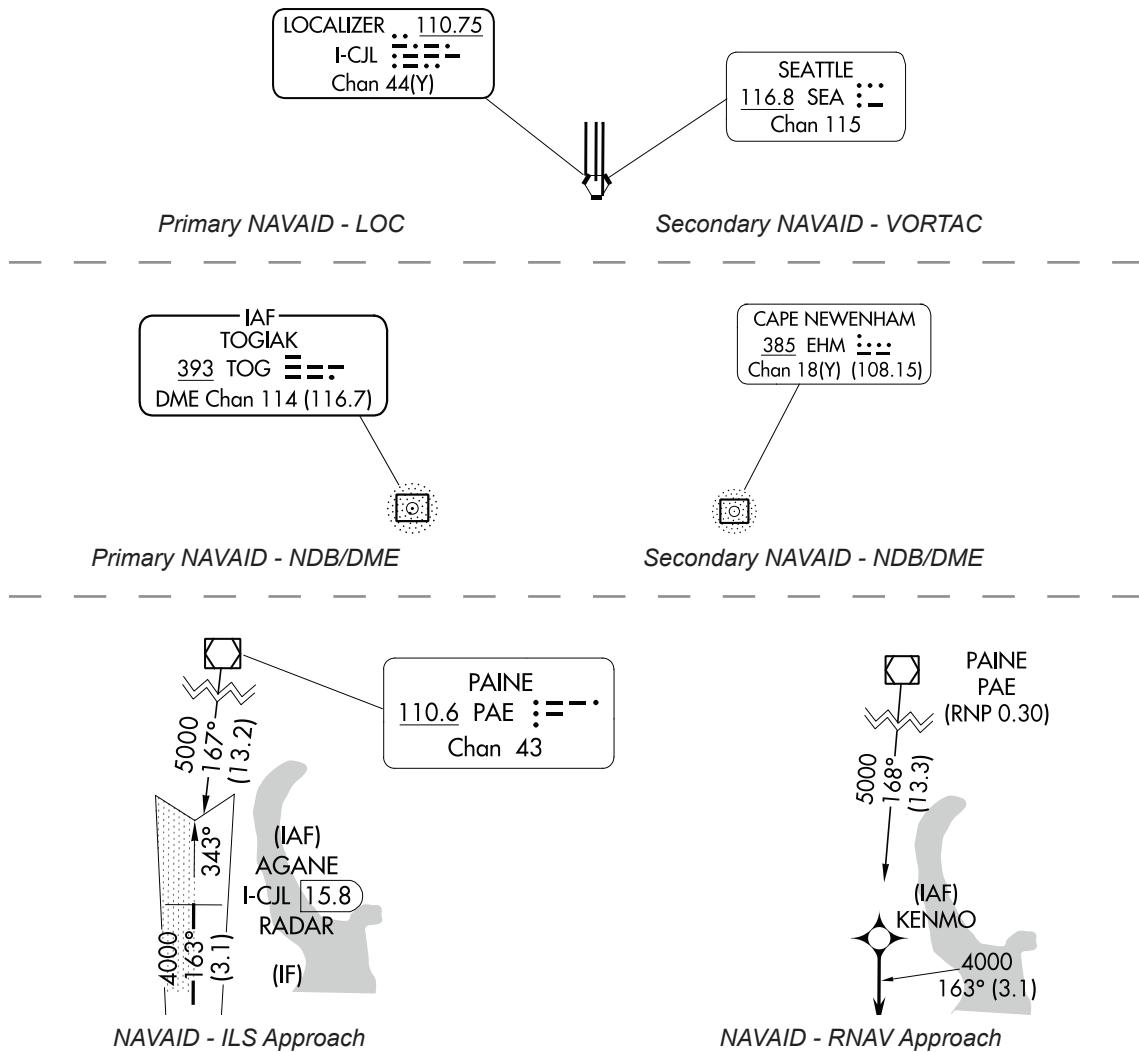
On RNAV charts where the visual track may only apply to a specific line of minima, the visual procedure track line will not be shown in the planview. There will be a note directed to that portion of the procedure track.



## NAVAIDs

NAVAIDs used on ground based charts will show the appropriate symbol accompanied by a data box that contains the facility name, frequency, identifier and Morse code. A NAVAID box with a heavy line indicates the primary NAVAID used for the approach.

NAVAIDs used on GPS based charts show the appropriate symbol identified with the name and identifier.



## Area Navigation (RNAV) Waypoints

Waypoints are shown with the waypoint symbol accompanied by the five letter identifier. If an RNAV waypoint is collocated with an intersection, DME fix, or NAVAID, the appropriate Intersection, DME fix, or NAVAID symbol will be charted.



On RNAV (RNP) charts, any requirement/capability notes are depicted below the fix/waypoint/NAVAID name. When the required RNP lateral accuracy value for any approach segment other than final approach (e.g. feeder, initial and/or intermediate or missed) are less than standard (RNP 2.00 for feeder, RNP 1.00 for initial and/or intermediate and missed), a note stating the required RNP value may be placed adjacent to the applicable fix at the beginning of the Feeder Route (or annotated in the PBN box). If there is more than one lateral accuracy value within these portions of the procedure, the lowest value is annotated. These notes will take the form "RNP 0.XX, or Min RNP 0.XX" and will be located in close proximity to the relevant fix name (or be identified in the PBN Box).



## Localizer Depiction

The localizer is depicted in the Planview using the following symbol. The size of the charted localizer symbol does not serve as an indication of the service volume.



## Restrictive Airspeed

Restrictive airspeeds are shown paired with their respective fix/facility.

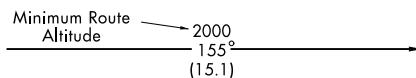
Type	Description	Example
Recommended Speed	Recommended speed is depicted with no lines above or below it	180K
Minimum Speed	Minimum speed is depicted as a number with a line below it	120K
Maximum Speed	Maximum speed is depicted as a number with a line above it	250K
Mandatory Speed	Mandatory speed is depicted as a number with a line above and below it	175K

## Altitudes

Restrictive altitudes are shown paired with their respective fix/ facility. Minimum, Maximum, Mandatory and Recommended Altitudes are shown.

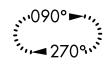
Type	Description	Example
Recommended Altitude	Recommended altitude is depicted with no lines above or below it	3000
Minimum Altitude	Minimum altitude is depicted as a number with a line below it	2500
Maximum Altitude	Maximum altitude is depicted as a number with a line above it	4300
Mandatory Altitude	Mandatory altitude is depicted as a number with a line above and below it	5500
Mandatory Block Altitude	Mandatory block altitude is depicted with a minimum and a maximum altitude.	5000 3000

Altitudes that are shown along a route are minimum altitudes.

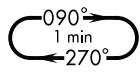


## Holding Patterns and Procedure Turns

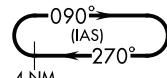
Holding Patterns are used for many reasons, including deteriorating weather or high traffic volume. Holding might also be required following a missed approach. Each holding pattern has a fix, a direction to hold from the fix, and an airway, bearing, course, radial, or route on which the aircraft is to hold. These elements, along with the direction of the turns, define the holding pattern. Holding Patterns may not always be depicted to scale.



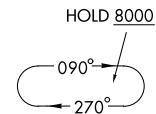
Missed Approach



Hold In-Lieu of Procedure Turn



4 NM

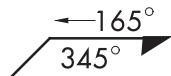


Arrival

If a holding pattern has a non-standard speed restriction, it will be depicted by an icon with the limiting air speed shown inside the holding pattern symbol. These elements, along with the direction of the turns, define the holding pattern. If two types of holds are located at the same point, the procedural holding pattern will be shown in-lieu of arrival or missed approach holding patterns. Timing or distance limits for Hold-in-lieu of Procedure Turn Holding Patterns will be shown.

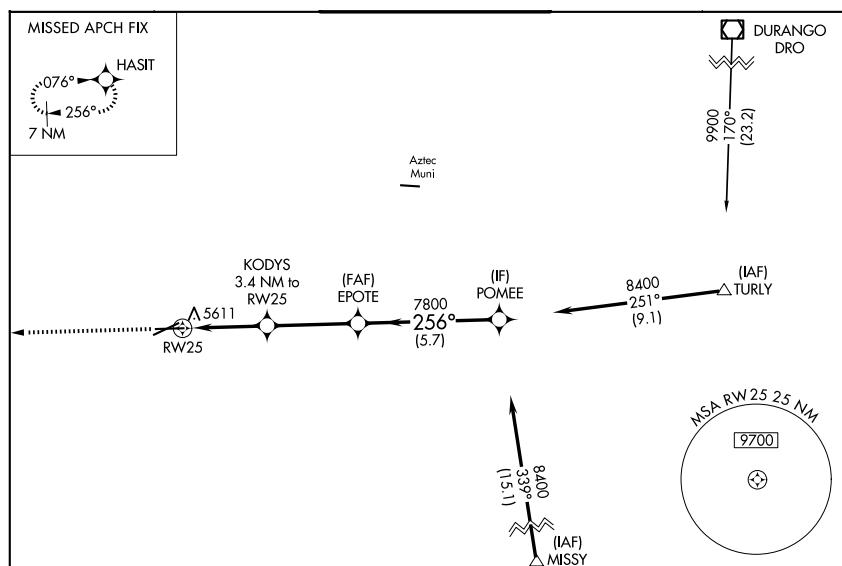
Waypoints designated as a holding fix are shown as fly-by, without the circle around the symbol. However, in the event the holding fix/waypoint is also designated in all other parts of the procedure unrelated to holding with a fly-over function, then the holding fix/waypoint will be charted as a fly-over point.

A procedure turn (PT) is the maneuver prescribed to perform a course reversal to establish the aircraft inbound on an intermediate or final approach course. The procedure turn or hold-in-lieu-of procedure turn is a required maneuver when it is depicted on the approach chart. However, the procedure turn or the hold-in-lieu-of PT is not permitted when the symbol "NoPT" is depicted on the initial segment being flown, when a RADAR VECTOR to the final approach course is provided, or when conducting a timed approach from a holding fix. The procedure turn will be shown in the planview and in the profile of the chart. In the planview, the tip of the procedure turn barb is shown at the procedure turn limit, e.g., 10 NM, 15 NM. Users should be aware that it is possible for there to be a terminal/feeder fix along the procedure track that is not associated with the procedure turn. Fixes associated with the procedure turn are depicted in the profile.



## Airports

The primary approach airport is shown to scale by a pattern of all the runways. Airports other than the primary approach airport may be shown with an airport pattern and name when in close proximity to the primary airport.

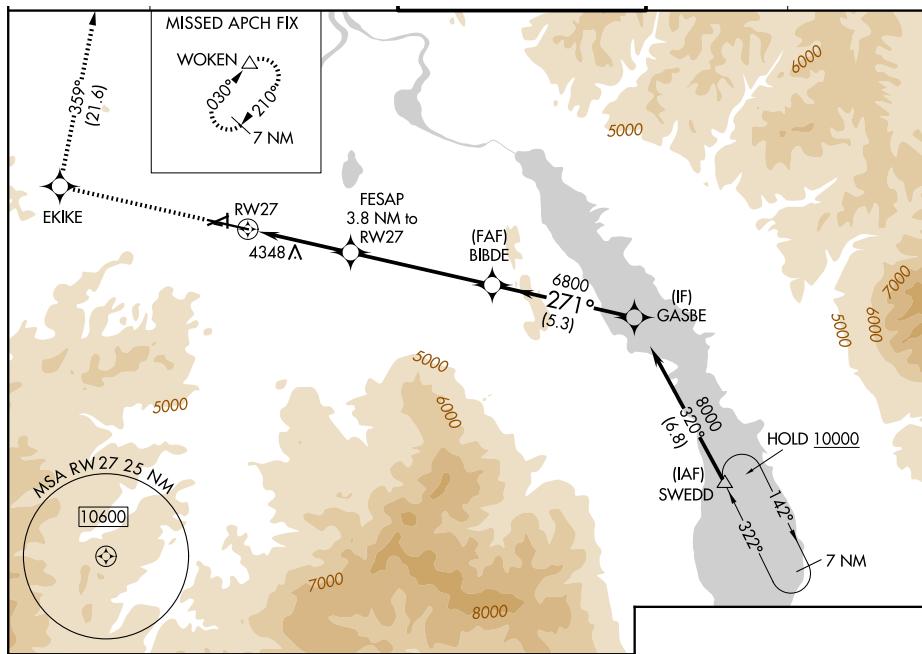


## Relief (Contours)

Relief (Contours) is depicted in the planview portion of all IAPs at airports that meet the following criteria:

- If the terrain within the planview exceeds 4,000 feet above the airport elevation, or
- If the terrain within a 6.0 nautical mile radius of the Airport Reference Point (ARP) rises to at least 2,000 feet above the airport elevation.

When an airport meets either of the above criteria, terrain will be charted by gradient tints of brown on all IAPs for that airport. Contour layers will be shown in no more than five brown tints, with consecutively darker tints used for consecutively higher elevation contour layers.



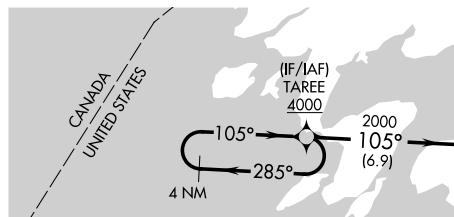
## Hydrography (Water)

Water Depiction is depicted in grey, in the planview portion of IAPs. See previous example. The following hydrographic features are shown:

- Oceans
- Significant rivers and streams
- Significant lakes - If only one river or one small lake is involved, not located in the immediate airport vicinity, the hydrographic information requirement may be waived.

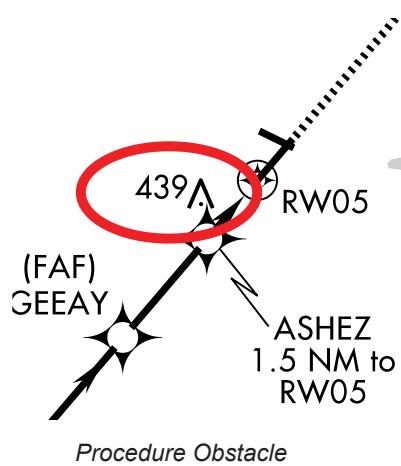
## International Boundary

When the planview includes a boundary of another country the International boundaries are shown by a dashed line. International boundaries are identified with country name within the country area.



## Obstacles

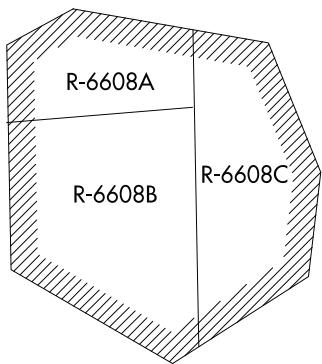
Procedural obstacles specifically indicated for charting by the approving authority will be charted. Obstacles identified as vegetation or ships will be indicated by a doubtful accuracy symbol  $\pm$  following the elevation value.



Procedure Obstacle

## Special Use Airspace (SUA)

SUAs consist 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. These are prohibited areas, restricted areas, warning areas, Military Operations Areas (MOAs), and alert areas. SUA that falls within the area of coverage of the instrument approach procedure chart are shown only when designated by the approving authority.

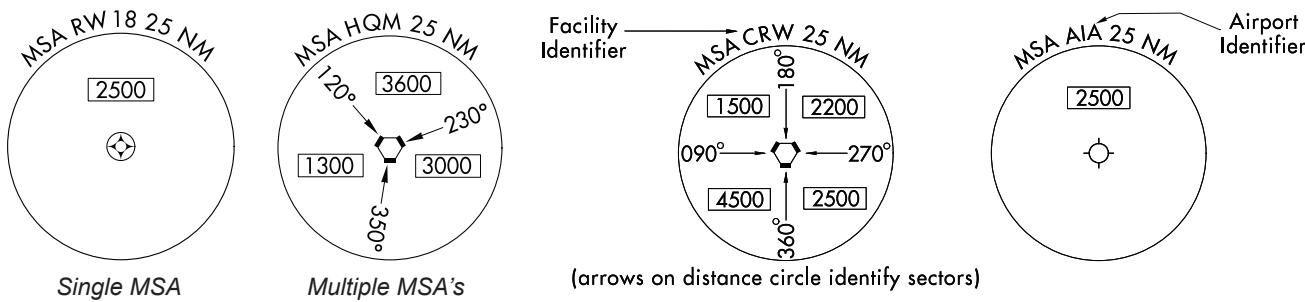


## Air Defense Identification Zone (ADIZ)

ADIZ is an area of airspace in which the identification, location, and control of aircraft is required in the interest of national security. When designated by the approving authority, ADIZ boundaries that fall within the area of coverage of the chart are shown. CONTIGUOUS U.S. ADIZ

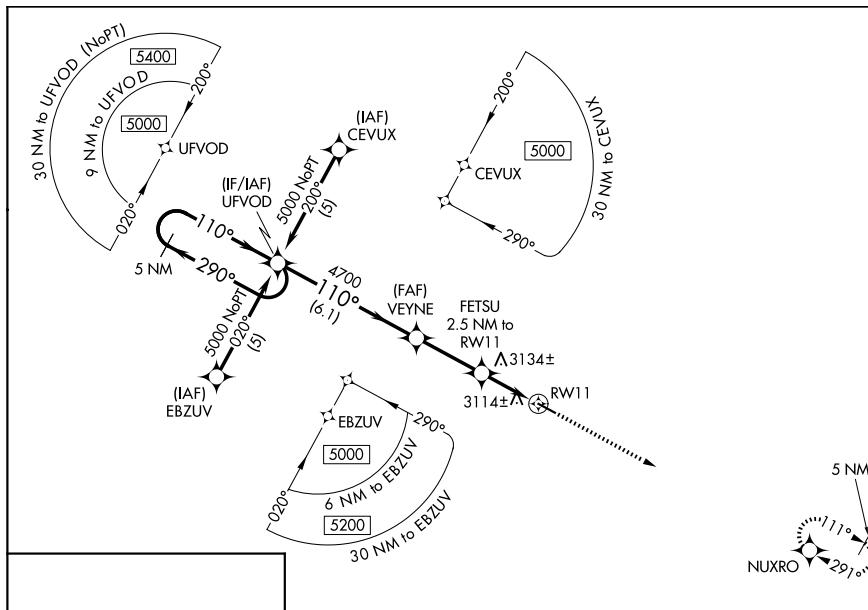
## Minimum Safe Altitude (MSA)

MSAs are published for emergency use on IAP charts. MSAs appear in the planview of all IAPs except on approaches for which a Terminal Arrival Area (TAA) is used. The MSA is based on the primary NAVAID, waypoint, or airport reference point on which the IAP is predicated. The MSA depiction on the approach chart contains the identifier of the NAVAID/waypoint/airport used to determine the MSA altitudes. MSAs are expressed in feet above mean sea level and normally have a 25 NM radius; however, this radius may be expanded to 30 NM if necessary to encompass the airport landing surfaces. Ideally, a single sector altitude is established and depicted on the planview of approach charts; however, when necessary to obtain relief from obstructions, the area may be further sectored and as many as four MSAs established. When established, sectors may be no less than 90° in spread. MSAs provide 1,000 feet clearance over all obstructions but do not necessarily assure acceptable navigation signal coverage.



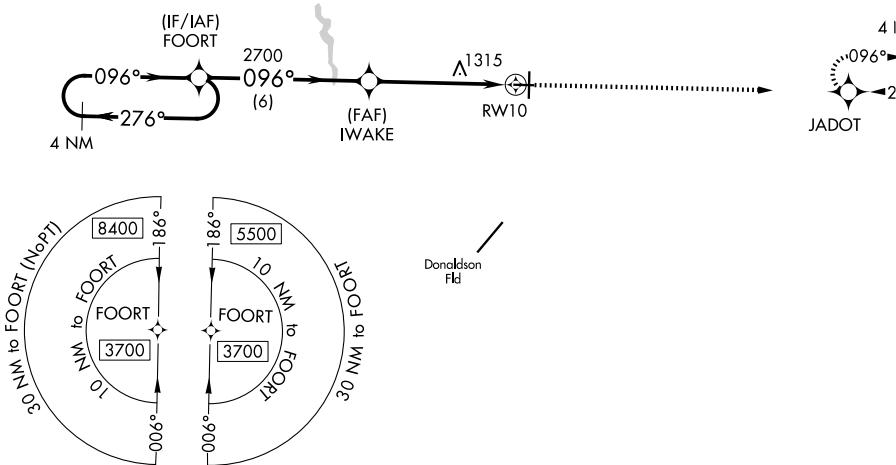
## Terminal Arrival Areas (TAAs)

The TAA icons will be positioned in the planview relative to their relationship to the procedure. The icon will not have feeder routes, airways, or radar vectors depicted. The TAA provides a transition from the enroute structure to the terminal environment with little required pilot/air traffic control interface for aircraft equipped with Area Navigation (RNAV) systems. A standard TAA has three areas: straight-in, left base, and right base. The arc boundaries of the three areas of the TAA are published portions of the approach. A TAA provides minimum altitudes with standard obstacle clearance when operating within the TAA boundaries. TAAs are primarily used on RNAV approaches but may be used on an ILS approach when RNAV is the sole means for navigation to the IF; however, they are not normally used in areas of heavy concentration of air traffic.



Example of Standard TAA

Non-standard TAAs may also be published; i.e., one base leg, no base legs.



Example of Non-Standard TAA

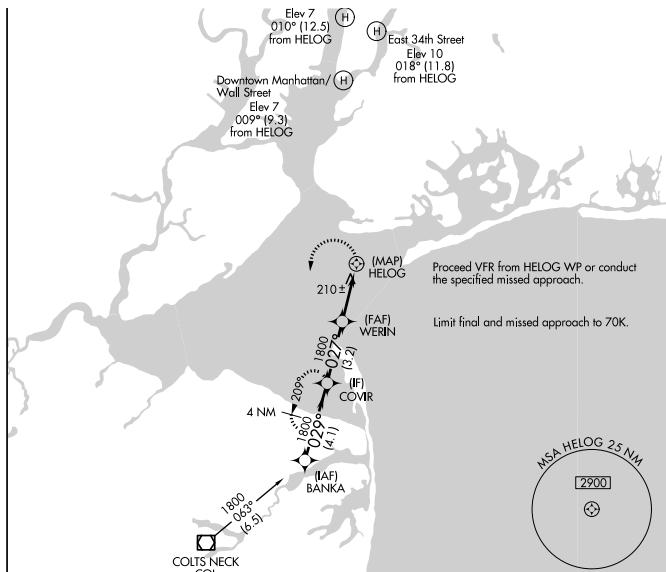
## Helicopter (Copter) Procedures

Copter procedures may contain either a visual or a VFR segment. Visual segments are depicted using the dashed line symbol below.



*Visual Flight Segment*

VFR Segments are not depicted with a line, but include the reference bearing and distance information at the endpoint of the VFR Segment, when provided, as shown below.



*Example of Copter with VFR Segment (JFK)*

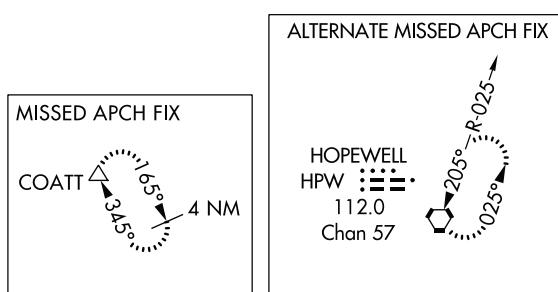
## MISSED APPROACH INFORMATION

Missed approach information is shown in 3 locations on the chart:

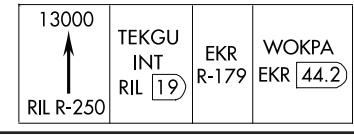
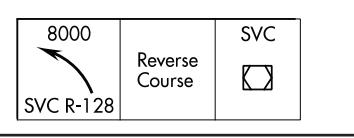
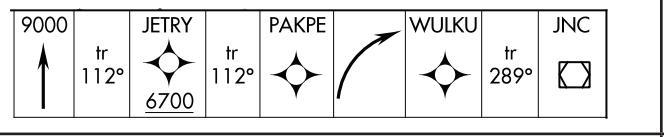
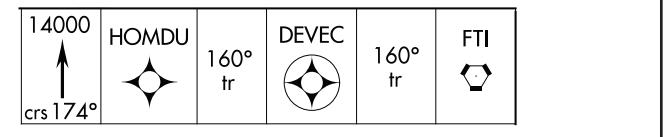
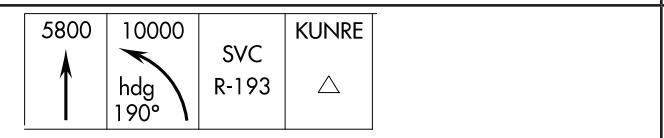
- The Middle Briefing Strip - The complete textual missed approach instructions are provided at the top of the approach chart in the middle pilot briefing strip.
- The Planview - The missed approach track is drawn using a thin, hash marked line with a directional arrow. If any portion of the missed approach procedure track is off the chart, the missed approach track shall extend to the chart border.



Missed approach holding patterns that lie outside the geographic parameters of the planview and are unable to be shown with a scale break will be shown as a boxed inset. All alternate missed approach holding patterns will be shown in an inset.



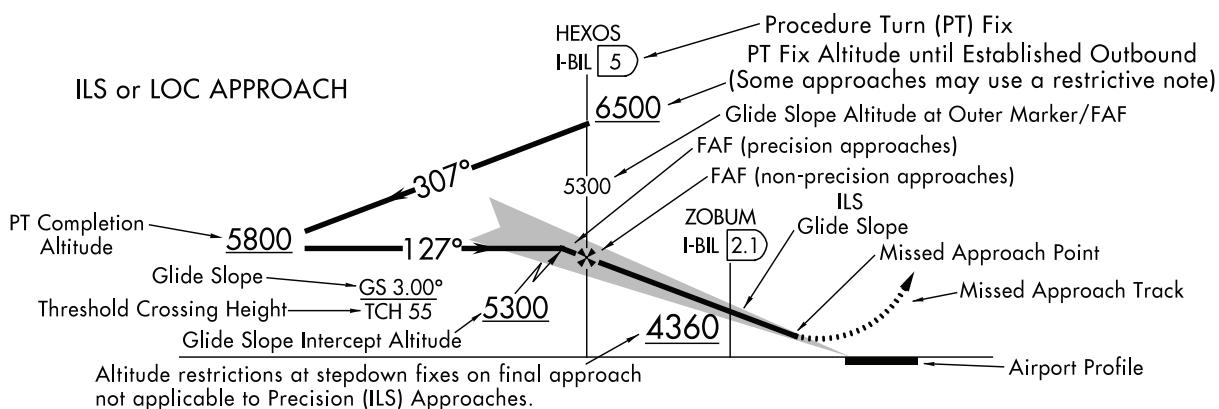
- The Profile Box - Missed Approach Icons will be depicted in the upper left or upper right of the profile box. The Missed Approach Icons are intended to provide quick, at a glance intuitive guidance to the pilot, to supplement the textual missed approach instructions in the briefing strip. Space permitting, all textual missed approach instructions will be graphically depicted in sequence. If space does not permit the depiction of all missed approach icons, only the first four icon boxes will be shown.

Example Missed Approach Icons	Missed Approach Text
	MISSSED APPROACH: Climb to 13000 on RIL VOR/DME R-250 to TEKGU INT/RIL 19 DME and on EKR VOR/DME R-179 to WOKPA/EKR 44.2 DME and hold, continue climb-in-hold to 13000.
	MISSSED APPROACH: Climbing left turn to 8000 via SVC R-128, then reverse course to SVC VOR/DME and hold.
	MISSSED APPROACH: Climb to 9000 on track 112° to JETRY, cross JETRY at or above 6700, and on track 112° to PAKPE, right turn to WULKU, and on track 289° to JNC VOR/DME and hold.
	MISSSED APPROACH: Climb to 14000 via 174° course to HOMDU and via 160° track to DEVEC and 160° track to FTI VORTAC and hold.
	MISSSED APPROACH: Climb to 5800, then climbing left turn to 10000 via heading 190° and SVC VOR/DME R-193 to KUNRE INT/SVC VOR/DME 24.1 DME and hold.

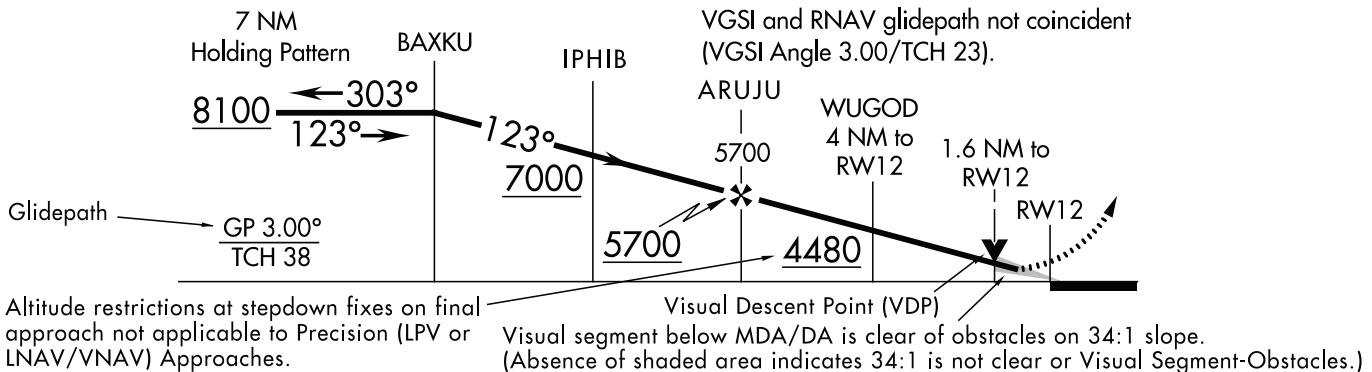
## PROFILE VIEW

A profile diagram of the instrument approach procedure is shown below the planview. The published descent profile and graphical depiction of the vertical path using those facilities, intersections, fixes, etc. identified in the procedure to the runway are shown. A profile view of the procedure track is shown. The approach track begins toward the top of the primary facility line, unless otherwise dictated by the procedure, and shall descend to where the final approach ends and the missed approach begins.

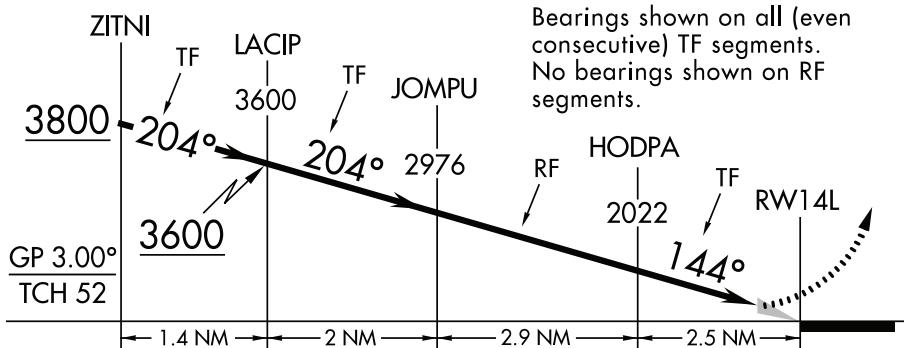
When a reference mark (\*, \*\*, #, etc.) is shown in the profile, the qualifying footnote is provided within the profile section.



## RNAV and GLS PROCEDURES WITH VERTICAL GUIDANCE

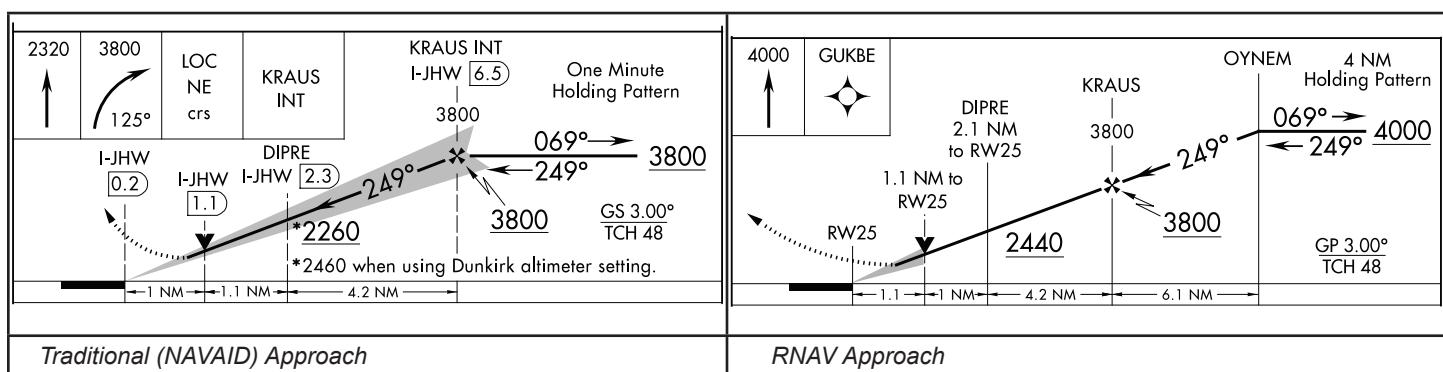


## RNP APPROACH WITH TF AND RF SEGMENTS



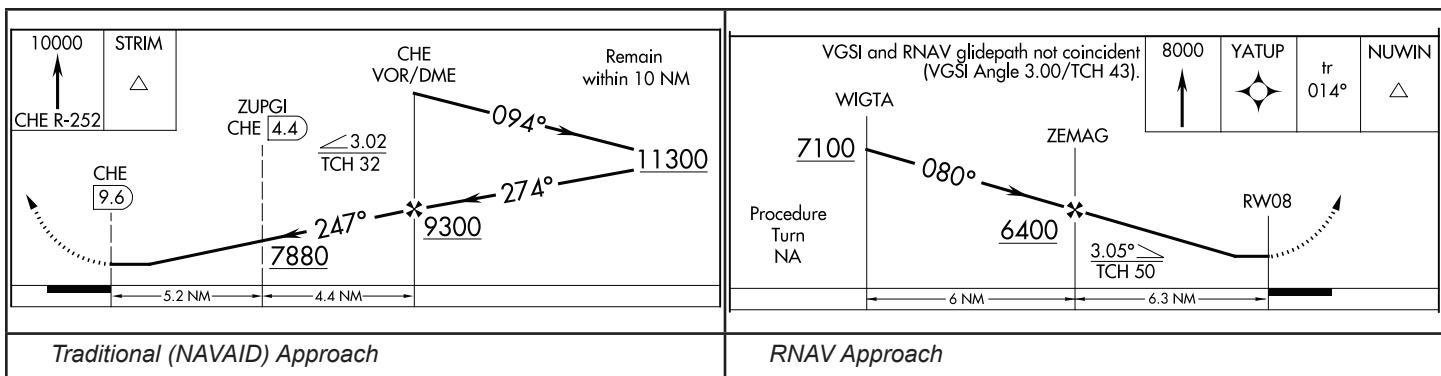
### Precision Approaches

On precision approaches, the glideslope (GS) intercept altitude is illustrated by a zigzag line and an altitude. This is the minimum altitude for GS interception after completion of the procedure turn. Precision approach profiles also depict the GS angle of descent, threshold crossing height (TCH) and GS altitude at the outer marker (OM) or designated fix. The missed approach track is symbolized using the hatched line pattern. Where separate missed approach points exist for precision and non-precision approaches on the same chart, e.g., ILS and LOC, the track will be shown from the precision point only.



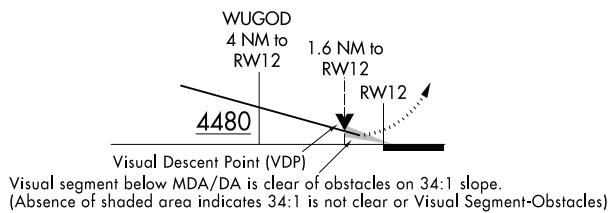
### Non-Precision Approaches

On non-precision approaches, the final segment begins at the Final Approach Fix (FAF), which is identified with the Maltese cross symbol . When no FAF is depicted, the final approach point is the point at which the aircraft is established inbound on the final approach course. Stepdown fixes may also be provided between the FAF and the airport for authorizing a lower minimum descent altitude (MDA) and are depicted with the fix or facility name and a dashed line. Altitude restrictions at stepdown fixes on the final approach on procedures with both precision and non-precision minima are not applicable to precision (ILS, LPV, or LNAV/VNAV) use of the approach. On non-precision only approach procedures, the approach track descends to the MDA or VDP point, thence horizontally to the missed approach point. The missed approach track on non-precision approaches is symbolized using the hatched line pattern and begins at the missed approach point.



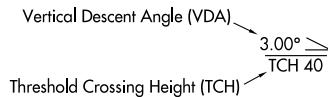
### Visual Descent Point (VDP)

The Visual Descent Point (VDP), is shown by a bold letter "V" positioned above the procedure track and centered on the accompanying dashed line. (See example below.) The VDP is a defined point on the final approach course of a non-precision straight-in approach procedure from which normal descent from the MDA to the runway touchdown point may be commenced.



### Vertical Descent Angle (VDA) and Threshold Crossing Heights (TCH)

A VDA and TCH may be published on non-precision approaches. For Copter approach procedures, a Heliport Crossing Height (HCH) will be depicted in place of the TCH. The VDA is strictly advisory and provides a means to establish a stabilized descent to the MDA. The presence of a VDA does not guarantee obstacle protection in the visual segment. If there are obstacles in the visual segment that could cause an aircraft to destabilize the approach between MDA and touchdown, the profile will not show a VDA and will instead show a note that states "Visual Segment-Obstacles".

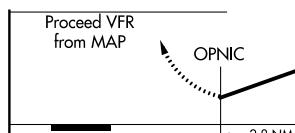


### Visual Flight Path

Instrument approach procedures, including Copter approach procedures, that terminate or have missed approaches prior to the airport, and are authorized to proceed visual, shall depict the visual segment by the dashed line symbol from the missed approach point to the airport. The note "Fly visual" ("Proceed visually" on Copter procedures) along with the bearing and distance shall be shown leadered to the visual flight path.

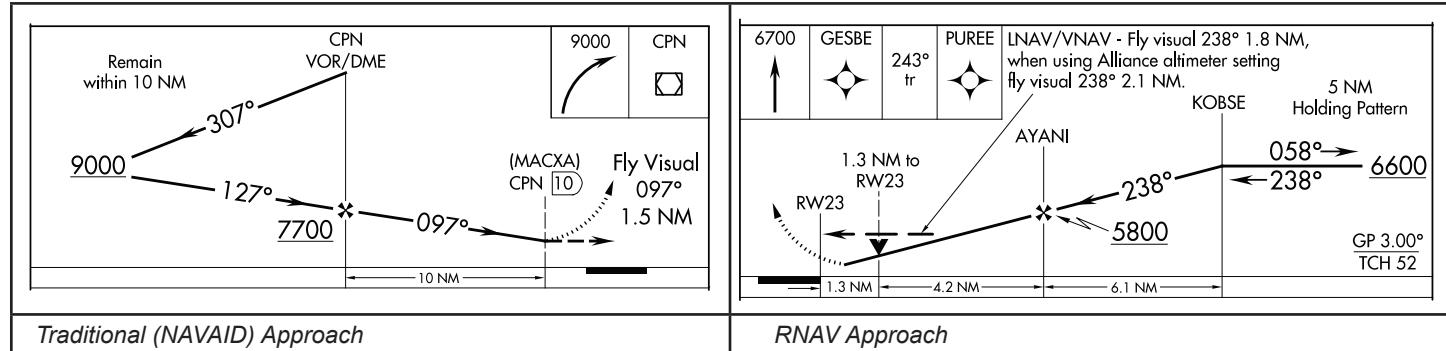
RNAV charts sometimes have visual flight for LNAV/VNAV minima that do not start at the missed approach point. An additional note indicating "LNAV/VNAV" will be placed above the note.

Copter approach procedures with a VFR segment from the missed approach point will not depict the VFR segment with a line in the profile. The note similar to "Proceed VFR from MAP" will be shown.



Copter VFR Segment

## Chart Examples



## ILS Glide Slope and RNAV Glidepath

A note providing the glide slope (GS) or glidepath (GP) angle and the threshold crossing height (TCH), are positioned in the lower half of the profile box

- GS will be shown on all ILS procedures.
- GP will be shown GLS procedures and all RNAV procedures with a published decision altitude

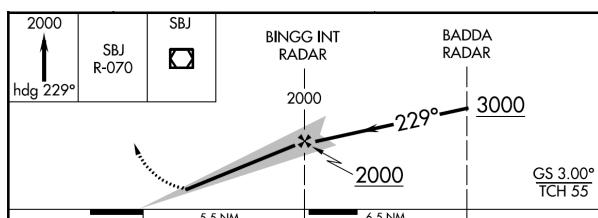
Threshold Crossing Height (TCH) has been traditionally used in “precision” approaches as the height of the glide slope above threshold. With publication of LNAV/VNAV minimums and RNAV descent angles, including graphically depicted descent profiles, TCH also applies to the height of the “descent angle,” or glidepath, at the threshold.

## 34:1 Surface Clear Stipple Symbol

On RNAV approach charts, a small shaded arrowhead shaped symbol from the end of the VDA to the runway indicates that the 34:1 Obstacle Clearance Surface (OCS) for the visual segment is clear of obstacles. The absence of the symbol indicates that the 34:1 OCS is not clear or a Visual Segment-Obstacles note is indicated on the chart. (See example in VDP Section.)

## Secondary Airports

Airports other than the airport of intended landing will be shown when requested and will be portrayed in the same manner as the primary airport. It will be placed in its approximate location along the final approach course.



## LANDING MINIMUMS

The landing minimums section is positioned directly below the profile. This section gives the pilot the lowest altitude and visibility requirements for the approach. There are two types of landing minimums: Straight-in landing or Circling. Straight-in landing minimums are the MDA and visibility, or DA and visibility, required for a straight-in landing on a specified runway. Circling minimums are the MDA and visibility required for the circle-to-land maneuver.

The minimums for straight-in and circling are located under each aircraft category. When there is not a division line between minimums for each category, the minimums apply to two or more categories.

LANDING MINIMA FORMAT					
In this example airport elevation is 1179, and runway touchdown zone elevation is 1152.					
CATEGORY	DA Visibility (RVR 100's of feet)		Aircraft Approach Category HAT		
	A	B	C	D	
S-ILS 27	1352/24		200	(200-½)	
S-LOC 27	1440/24	288	(300-½)	1440/50 288 (300-1)	
CIRCLING	1540-1 361 (400-1)	1640-1 461 (500-1)	1640-1½ 461 (500-1½)	1740-2 561 (600-2)	
	MDA	HAA	Visibility in Statute Miles		

Straight-in ILS to Runway 27

Straight-in with Glide Slope Inoperative or not used to Runway 27

All weather minimums in parentheses not applicable to Civil Pilots.

Military Pilots refer to appropriate regulations.

COPTER MINIMA ONLY					
CATEGORY	COPTER				
H-176°	680-½ 363 (400-½)				

Copter Approach Direction

Height of MDA/DA Above Landing Area (HAL)

No circling minimums are provided

A second category of straight-in minimums called "sidestep" may be depicted where parallel runways exist.

CATEGORY	A	B	C	D
S-ILS 24R		320/18	200 (200-½)	
S-LOC 24R	460/24	340 (400-½)		460/40 340 (400-¾)
SIDESTEP RWY 24L	580/50	459 (500-1)		580-1½ 459 (500-1½)

The terms used to describe the minimum approach altitudes differ between precision and nonprecision approaches. Precision approaches use DA and nonprecision approaches use MDA, both expressed in feet MSL. The minimum approach altitudes are also referenced to height above touchdown elevation (HAT) for straight-in approaches, or height above airport (HAA) for circling approaches. The figures listed parenthetically are for military operations and are not used in civil aviation.

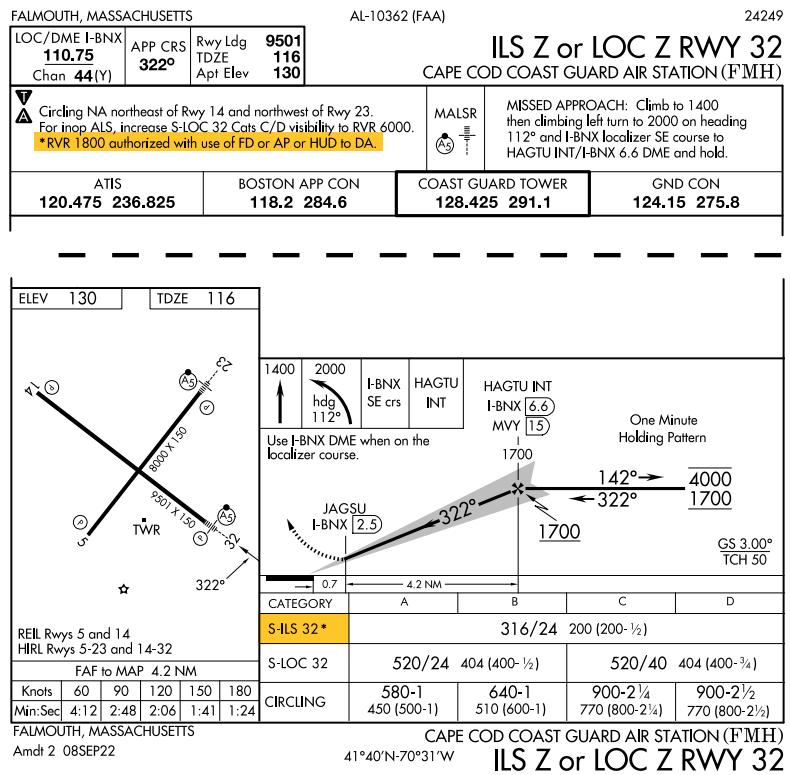
The visibility values are shown after the DA or MDA. They are provided in statute miles or runway visual range (RVR). RVR is reported in hundreds of feet. If the visibility is in statute miles, there is an altitude number, hyphen, whole or fractional number, e.g. 530-1. This indicates 530 feet MSL and 1 statute mile of visibility. The RVR value is separated from the minimum altitude with a slash, e.g., 1540/24. This indicates 1540 feet MSL and RVR of 2400 feet. When an RVR value is shown, the comparable statute mile equivalent is shown within the military minimums in parentheses as shown in the examples above. This value is determined from the Comparable Values of RVR and Visibility table located in the TPP Legend.

### Comparable Values of RVR and Visibility

The following table shall be used for converting RVR to ground or flight visibility. For converting RVR values that fall between listed values, use the next higher RVR value; do not interpolate. For example, when converting 4800 RVR, use 5000 RVR with the resultant visibility of 1 mile.

RVR (feet)	Visibility (SM)						
1600	¼	2400	½	3500	⅔	5500	1
1800	½	2600	½	4000	¾	6000	1¼
2000	½	3000	⅔	4500	⅔		
2200	½	3200	⅔	5000	1		

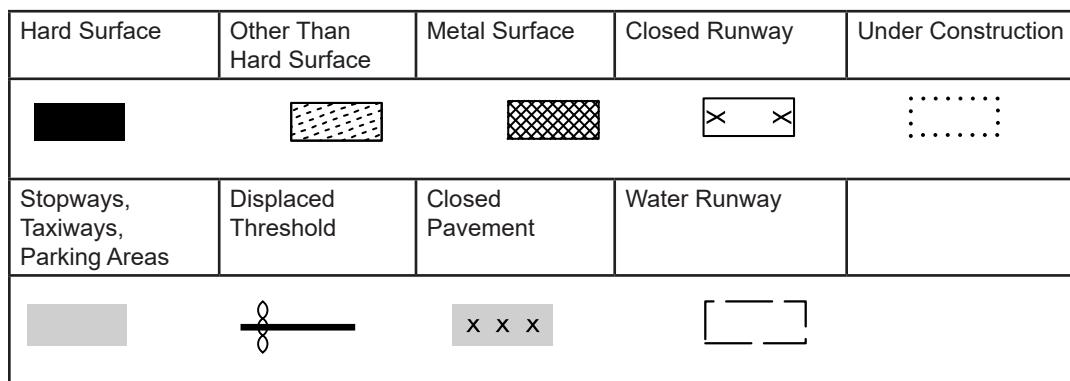
When a reference mark (\*, \*\*, #, etc.) is shown on a line of minimums, the qualifying footnote is provided in the notes section.



## AIRPORT SKETCH

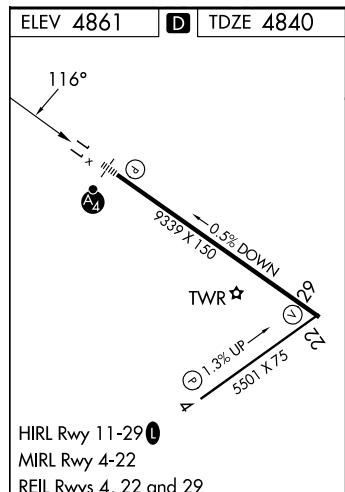
The airport sketch is a depiction of the airport with emphasis on runway pattern and related information, positioned in either the lower left or lower right corner of the chart to aid pilot recognition of the airport from the air and to provide some information to aid on ground navigation of the airport. The runways are drawn to scale and oriented to true north. Runway dimensions (length and width) are shown for all active runways.

Runway(s) are depicted based on what type and construction of the runway.



Taxiways, aprons, and hardstands are only shown at airports that do not have a published airport diagram. Other runway features that may be shown are runway numbers, runway dimensions, runway slope, arresting gear, and displaced thresholds.

Other information concerning lighting, airport beacon, control tower, NAVAIDs, and helipads may also be shown. The final approach course or an extension of the final approach course will be shown on all IAPs except ILS CAT II, ILS CAT II & III, ILS SA CAT I, ILS SA CAT II, and ILS SA CAT I & II.



## Airport Elevation and Touchdown Zone Elevation

The airport elevation is shown enclosed within a box in the upper left corner of the sketch box and the touchdown zone elevation (TDZE) is shown in the upper right corner of the sketch box. The airport elevation is the highest point of an airport's usable runways measured in feet from mean sea level. The TDZE is the highest elevation in the first 3,000 feet of the landing surface. Circling only approaches will not show a TDZE.

## Runway Declared Distance Information

Runway declared distance information when available will be indicated by **D** and is shown to the right of the airport elevation in the sketch box. Declared distances for a runway represent the maximum distances available and suitable for meeting takeoff and landing distance performance requirements.

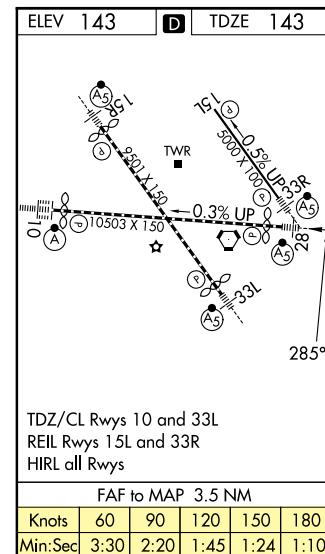
## Runway Lights

Notes regarding approach lighting systems are shown at the bottom of the sketch box. Runway lights (HIRL) (MIRL) (LIRL) (TDZL) (TDZ/CL) shall be indicated by a note, e.g. HIRL Rwy 9-27. Pilot capability to activate the airport lighting is shown using a **L** symbol.

Other approach lighting is shown on the airport sketch as a symbol on the side of the runway where they are actually located. Symbols that are shown in negative indicate pilot-controlled lighting.

Runway centerline lights (CL) are installed on some precision approach runways to facilitate landing under adverse visibility conditions. They are located along the runway centerline and are spaced at 50 foot intervals. Runways with CL are shown in a negative dot pattern through the middle of the solid runway as illustrated in the airport sketch to right.

Runway centerline lights will be indicated by a note only when pilot controlled or when paired with TDZL, e.g., TDZ/CL Rwy 6 and 24.



## Time/Distance Table

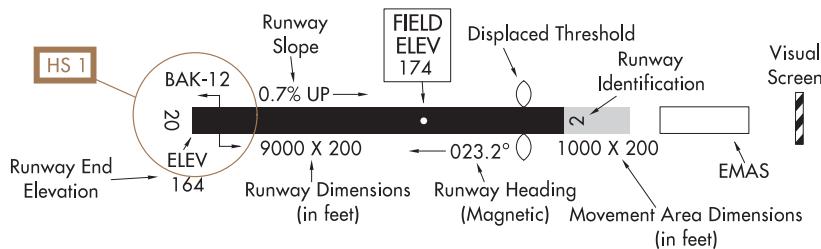
When applicable, a Time/Distance Table is provided below the airport sketch. The table provides the distance and time that is required from the final approach fix to the missed approach point for select groundspeeds.

## Base Information (Copter Approaches Only)

Base Information, as required and necessary to identify the MAP area and in the vicinity of the landing area shall be provided. Information shall be limited to and depict significant visual landmark features at and surrounding the MAP area and the heliport/pad of intended landing.

## AIRPORT DIAGRAMS

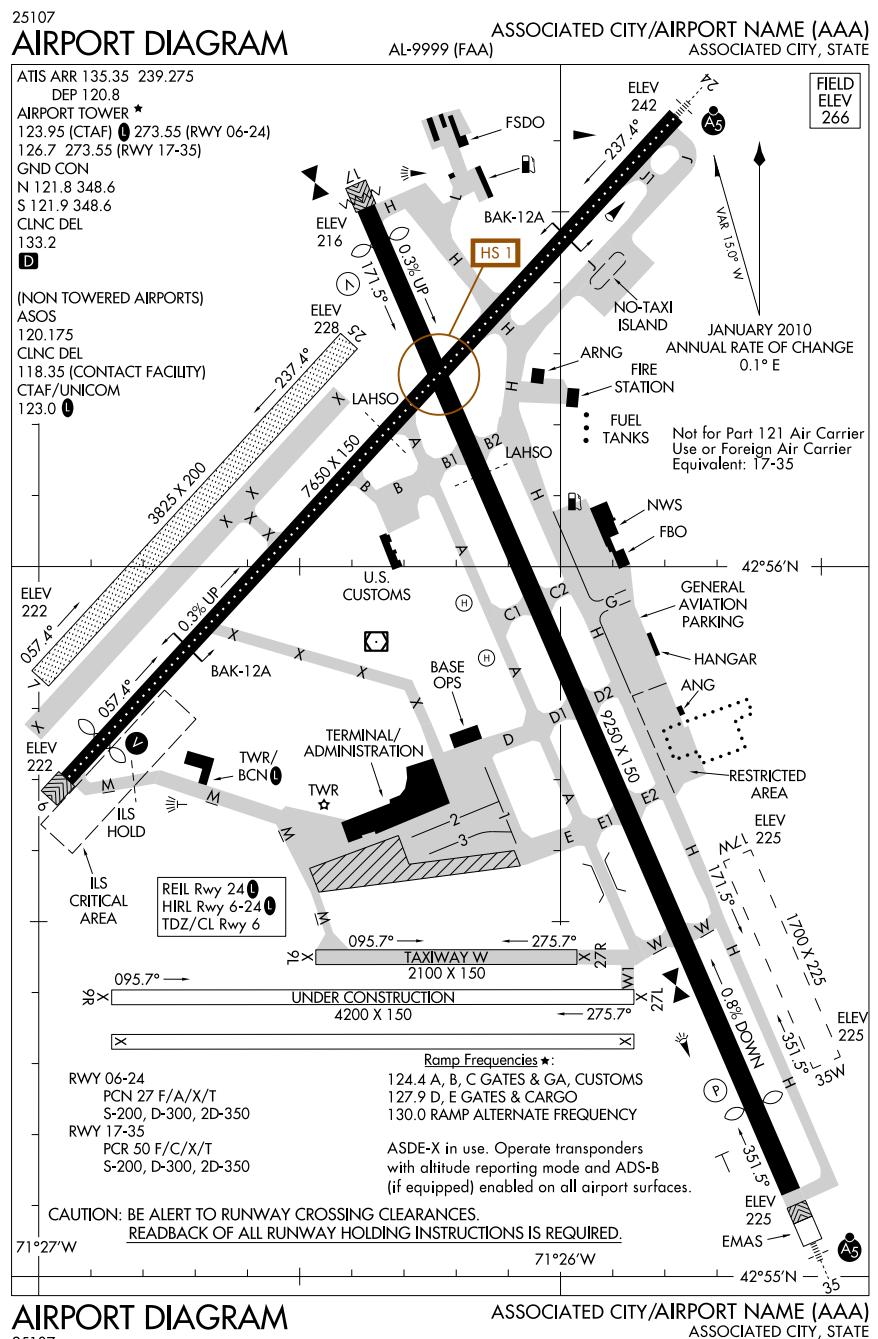
Airport Diagrams are specifically designed to assist in the movement of ground traffic at locations with complex runway/taxiway configurations. Airport Diagrams are not intended for use in approach and landing or departure operations. An airport diagram assists pilots in identifying their location on the airport, thus reducing requests for "progressive taxi instructions" from controllers.



## Airport Diagram Features:

1. Runways
  - a. Complete with magnetic headings (including magnetic variation and epoch year) and identifiers.
  - b. Runways under construction shall also be shown.
  - c. Runway dimensions, displaced thresholds, runway end elevations.
  - d. Runway surface composition
  - e. Weight bearing capacity (landing gear configuration or Pavement Classification Number)
  - f. Land and Hold Short (LAHSO) lines, ILS hold lines, Localizer/Glide Slope Critical Areas.
  - g. Arresting Gear. To include Engineered Materials Arresting System (EMAS).
2. Taxiways, with identifiers. Taxiways under construction shall also be shown.
3. Hot Spot locations.
4. Parking areas, run-up pads, alert areas, landing pads, "Non-Movement" areas (where pilot is NOT under air traffic control), ramps, aprons and hold pads.
5. Turnarounds and run-up areas.
6. Stopways, overruns, and blast pads.
7. Large tanks, including fueling area.
8. Control towers (include tower height).
9. Airport beacon.
10. Landing direction indicators.
11. Lighting.
12. Navigational Aids (NAVAIDs).
13. Helicopter pads.
14. Radar reflectors.
15. Any building that pilot can taxi to. Other buildings to include terminal/administration and Base operations, fire station, NWS, AFSS, FAA, FSDO, ANG, USCG, FBO.
16. Comm Frequencies.

Note: Star when used in the Comm Frequencies indicates part-time status. Check Chart Supplement for times of operation.



AIRPORT DIAGRAM  
25107  
ASSOCIATED CITY/AIRPORT NAME (AAA)  
ASSOCIATED CITY, STATE

## Runway Construction

Paved or hard surfaced runways consisting of concrete, asphalt, bitumen, or macadam are shown in solid color. Metal surfaced runways are shown using a solid color crosshatch pattern. Ultralight areas, ski landing areas, unpaved or runway other than hard surface, such as sod, clay, gravel, etc., is shown using a solid color dot pattern. Further details regarding runway surface and surface treatment can be found in the Chart Supplement.

Runway construction is depicted as follows:

Hard Surface	Other Than Hard Surface	Metal Surface	Closed Runway	Under Construction
Taxiways, Parking Areas	Displaced Threshold	Closed Pavement	Water Runway	Stopways, Overruns, Blast Pads

## Hot Spots

Hot Spots (HS) are a runway safety related problem area or intersection on an airport. Typically it is a complex or confusing taxiway/taxiway or taxiway/runway intersection. A confusing condition may be compounded by a miscommunication between a controller and a pilot, and may cause an aircraft separation standard to be compromised. The area may have a history of surface incidents or the potential for surface incidents.

Hot Spots are indicated on the Airport Diagram with a brown open circle or ellipse leadered to a Hot Spot number, e.g., HS 1. The number corresponds to a listing and description on the Hot Spot page in the front the TPP. More information and the location of Hot Spots can be found at [http://www.faa.gov/airports/runway\\_safety/hotspots/hotspots\\_list/](http://www.faa.gov/airports/runway_safety/hotspots/hotspots_list/).

## DEPARTURE PROCEDURES (DPs)

Departure Procedures (DPs) are designed specifically to assist pilots in avoiding obstacles during the climb to the minimum enroute altitude, and/or airports that have civil IFR takeoff minimums other than standard. There are two types of DPs: Obstacle Departure Procedures (ODPs), printed either textually or graphically and Standard Instrument Departures (SIDs), always printed graphically. SIDs are primarily designed for system enhancement and to reduce pilot/controller workload, and require ATC clearance. ODPs provide obstruction clearance via the least onerous route from the terminal area and may be flown without ATC clearance. All DPs provide the pilot with a safe departure from the airport and transition to the enroute structure.

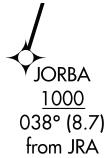
Generally, DP charts are depicted "not to scale" due to the great distances involved on some procedures or route segments. A "to scale" portrayal may be used if readability is assured.

The DP will show the departure routing, including transitions to the appropriate enroute structure. All routes, turns, altitudes, NAVAIDs, facilities forming intersections and fixes, and those facilities terminating the departure route are shown. A textual description of the departure procedure is also provided. For RNAV DPs, the transition text consists of the transition name and associated computer code. On non-RNAV DPs, the transition text will also include the description of all turns, altitudes, radials, bearings and facilities/fixes needed to guide the user from the common departure point to the terminating facility fix.

Copter DPs may also include a visual or VFR segment. Visual segments are depicted using the dashed line symbol below.



VFR Segments are not depicted with a line, but include the reference bearing and distance information at the endpoint of the VFR Segment, when provided, as shown below.



(H)  
Example of Copter with VFR Segment

## STANDARD TERMINAL ARRIVAL (STARs) CHARTS

STARs are pre-planned Instrument Flight Rule (IFR) air traffic control arrival procedures for pilot use in graphic and/or textual form. STARs depict prescribed routes to transition the aircraft from the enroute structure to a fix in the terminal area from which an instrument approach can be conducted. STARs reduce pilot/controller workload and air-ground communications, minimizing error potential in delivery and receipt of clearances.

STAR charts generally shall be depicted 'not to scale' due to the great distances involved on many procedures and route segments. A 'to scale' depiction may be used only if readability is assured.

The STAR will show the arrival routing, including transitions from the appropriate enroute structure. All routes, turns, altitudes, NAVAIDs, facilities forming intersections and fixes, and those facilities/fixes terminating or beginning the arrival route shall be shown in the graphic depiction. A textual description of the arrival procedure is also provided. For RNAV STARs, transition text will consist of the transition name and associated computer code. For non-RNAV STARs, the transition text will also include a description of all turns, altitudes, radials, bearings and facilities/fixes needed to guide the user from the entry point to the common facility/fix.

## CHARTED VISUAL FLIGHT PROCEDURE (CVFP) CHARTS

CVFPs are charted visual approaches established for environmental/noise considerations, and/or when necessary for the safety and efficiency of air traffic operations. The approach charts depict prominent landmarks, courses, and recommended altitudes to specific runways. CVFPs are designed to be used primarily for turbojet aircraft. CVFPs are not instrument approaches and do not have missed approach segments.

CVFPs are named for the primary landmark and the specific runway for which the procedure is developed, such as: RIVER VISUAL RWY 18, STADIUM VISUAL RWY 24. The CVFP charts are divided into planview and notes sections separated by a bar scale in 1 NM increments. The planview of the CVFP includes the portrayal of visual approach procedures information, such as landmarks, NAVAIDs, visual track, hydrography, special use airspace and cultural features, as applicable.

CVFPs originate at or near, and are designed around, prominent visual landmarks and typically do not extend beyond 15 flight path miles from the landing runway. Visual tracks start at a geographical point or landmark where the procedure must be flown visually to the airport. The visual track is indicated by a dashed line. Visual tracks may include the track value, distance and minimum or recommended altitudes.

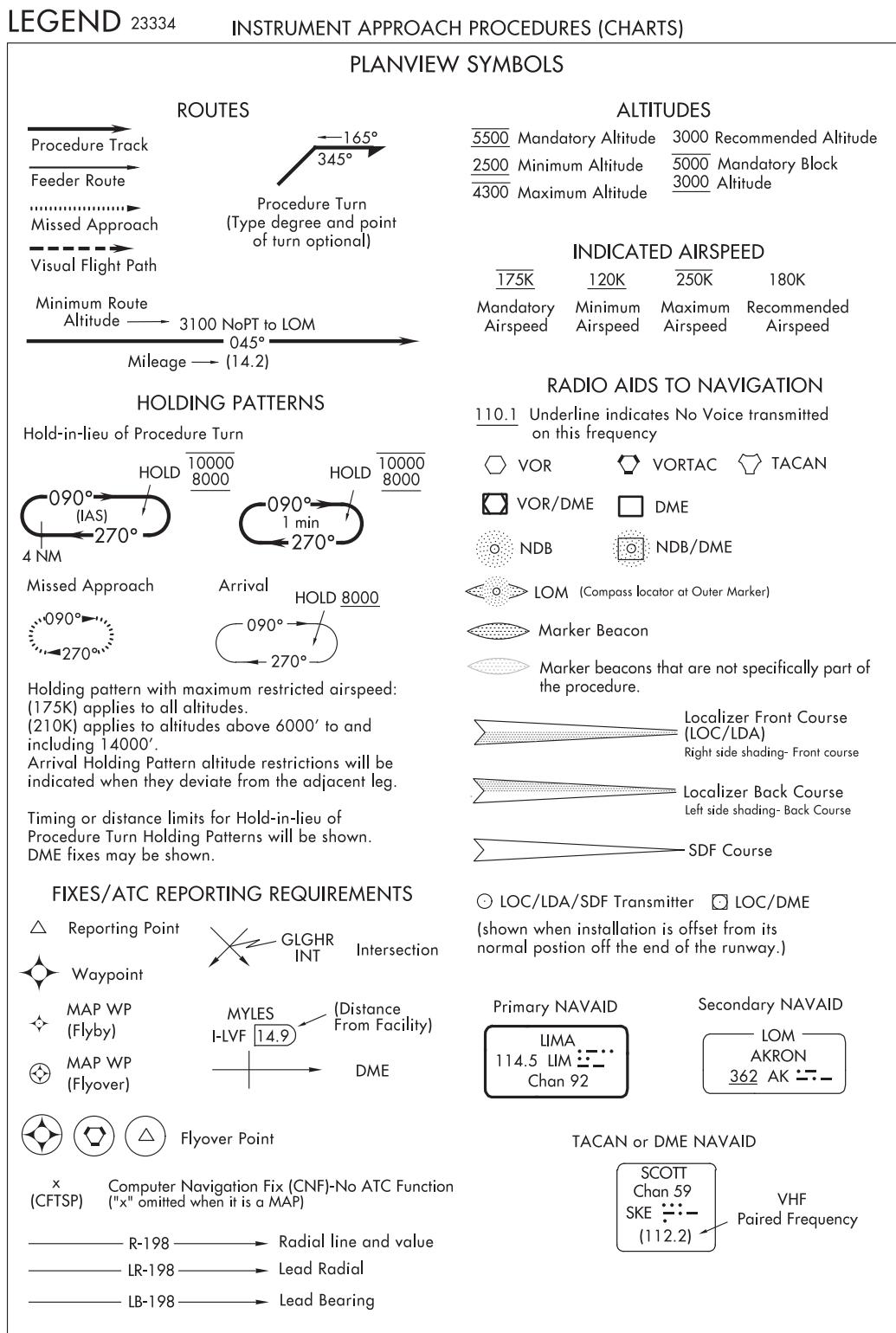


# U.S. TERMINAL PROCEDURES PUBLICATION SYMBOLS

## GENERAL INFORMATION

Symbols shown are for the Terminal Procedures Publication (TPP), which includes Standard Terminal Arrival (STARs) Charts, Departure Procedures (DPs), Instrument Approach Procedures (IAP) and Airport Diagrams.

## PLANVIEW SYMBOLS



LEGEND 23334

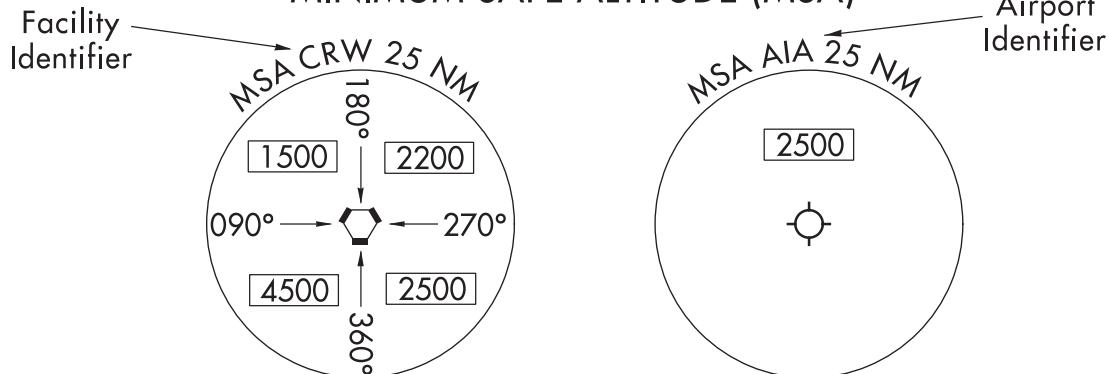
## PLANVIEW SYMBOLS (Continued)

LEGEND 23110

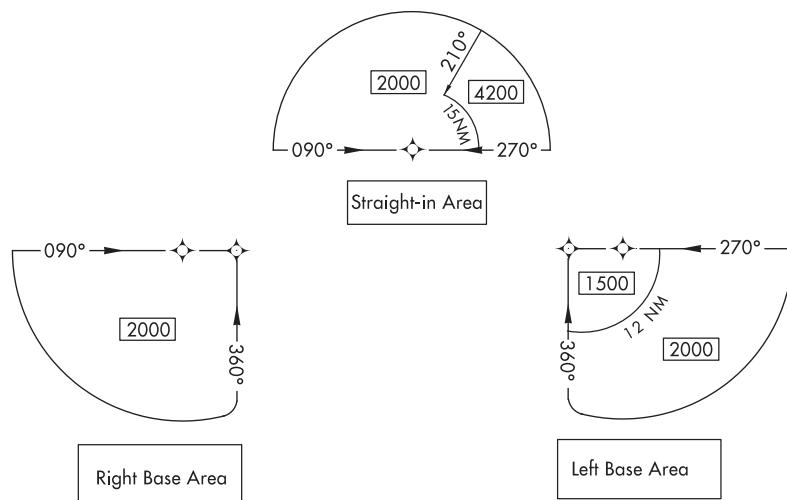
INSTRUMENT APPROACH PROCEDURES (CHARTS)

### PLANVIEW SYMBOLS

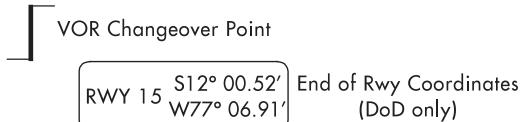
#### MINIMUM SAFE ALTITUDE (MSA)



#### TERMINAL ARRIVAL AREA (TAA)



#### MISCELLANEOUS



#### SPECIAL USE AIRSPACE



R-Restricted  
P-Prohibited  
MOA-Military Operations Area

W-Warning  
A-Alert

Distance not to scale

International Boundary

Air Defense Identification Zone

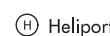
#### AIRPORTS



Primary and  
Secondary (named  
in planview)



Seaplane Base



Joint (Civil-Military)

#### OBSTACLES

- Spot Elevation
- Λ Obstacle
- Λ Highest Obstacle
- Highest Spot Elevation
- ℳ Group of Obstacles
- ± Doubtful accuracy

LEGEND 23110

# PROFILE VIEW

LEGEND 24361

## INSTRUMENT APPROACH PROCEDURES (CHARTS)

### PROFILE VIEW

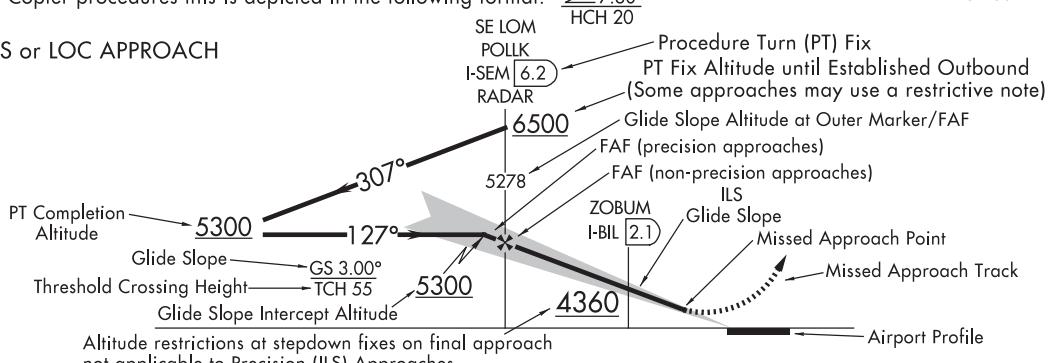
Three different methods are used to depict either electronic or vertical guidance: "GS", "GP", or "VDA".

1. "GS" indicates that an Instrument Landing System (ILS) electronic glide slope (a ground antenna) provides vertical guidance. The profile section of ILS procedures depict a GS angle and TCH in the following format:  $\frac{GS\ 3.00^\circ}{TCH\ 55}$ .

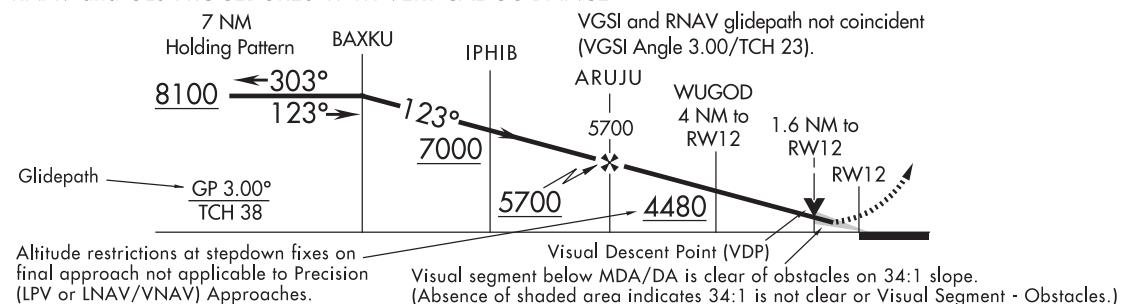
2. "GP" on GLS and RNAV procedures indicates that either electronic vertical guidance (via Wide Area Augmentation System - WAAS or Ground Based Augmentation System - GBAS) or barometric vertical guidance is provided. GLS and RNAV procedures with a published decision altitude (DA/H) depict a GP angle and TCH in the following format:  $\frac{GP\ 3.00^\circ}{TCH\ 50}$ .

3. An advisory vertical descent angle (VDA) is provided on non-vertically guided conventional procedures and RNAV procedures with only a minimum descent altitude (MDA) to assist in preventing controlled flight into terrain. On Civil (FAA) procedures, this information is placed above or below the procedure track following the fix it is based on. Absence of a VDA or a note that the VDA is not authorized indicates that the prescribed obstacle clearance surface is not clear and the VDA must not be used below MDA. VDA is depicted in the following format:  $\frac{\leq 3.00^\circ}{TCH\ 55}$ . On Copter procedures this is depicted in the following format:  $\frac{\leq 7.30^\circ}{HCH\ 20}$ .

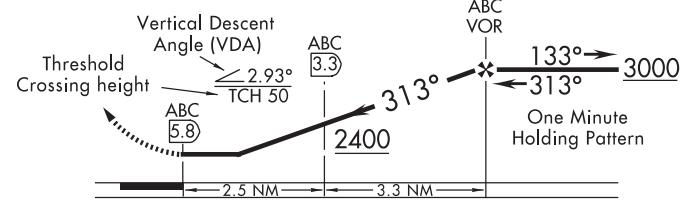
#### ILS or LOC APPROACH



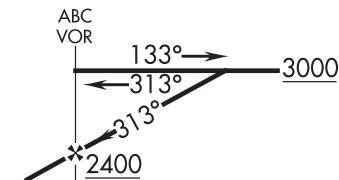
#### RNAV and GLS PROCEDURES WITH VERTICAL GUIDANCE



#### NON-VERTICALLY GUIDED CONVENTIONAL PROCEDURES AND RNAV PROCEDURES WITH MDA ONLY



#### DESCENT FROM HOLDING PATTERN

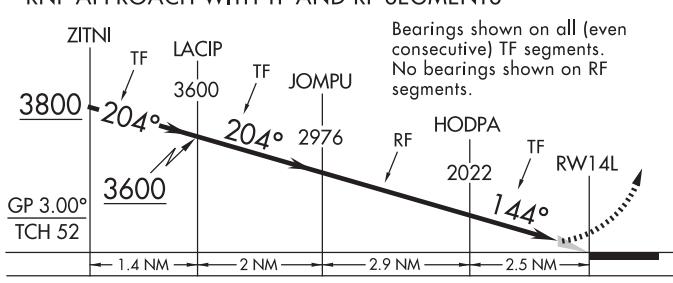


5500	Mandatory Altitude	3000	Recommended Altitude
2500	Minimum Altitude	5000	Mandatory Block Altitude
4300	Maximum Altitude	3000	Altitude

#### PROFILE SYMBOLS

	Note: Facilities and waypoints are depicted as a solid vertical line while fixes and intersections are depicted as a dashed vertical line.
	▼ Visual Descent Point (VDP)
	—> Visual Flight Path

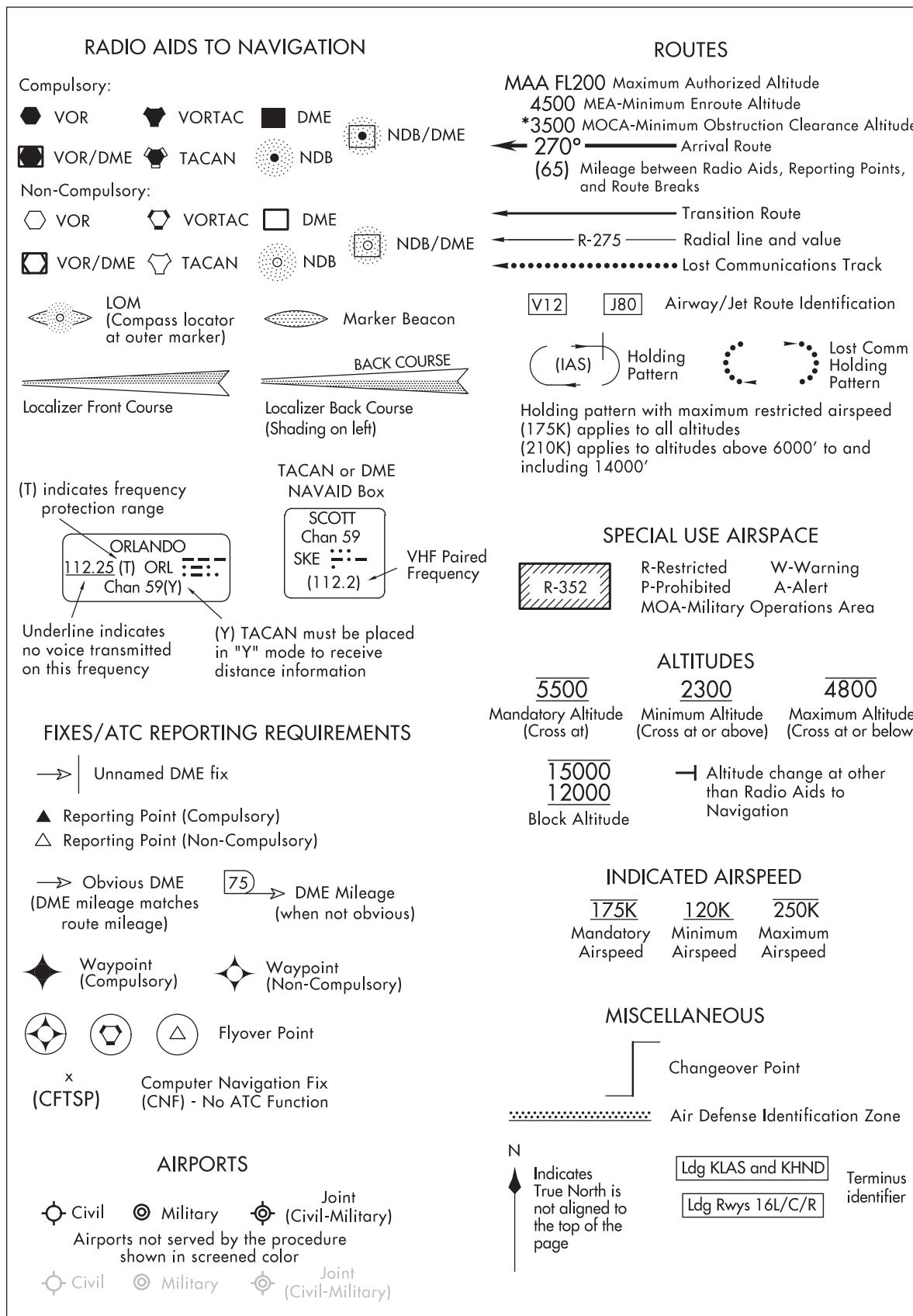
#### RNP APPROACH WITH TF AND RF SEGMENTS



LEGEND 24361

# STANDARD TERMINAL ARRIVAL (STAR) CHARTS

## LEGEND 23334 STANDARD TERMINAL ARRIVAL (STAR) CHARTS



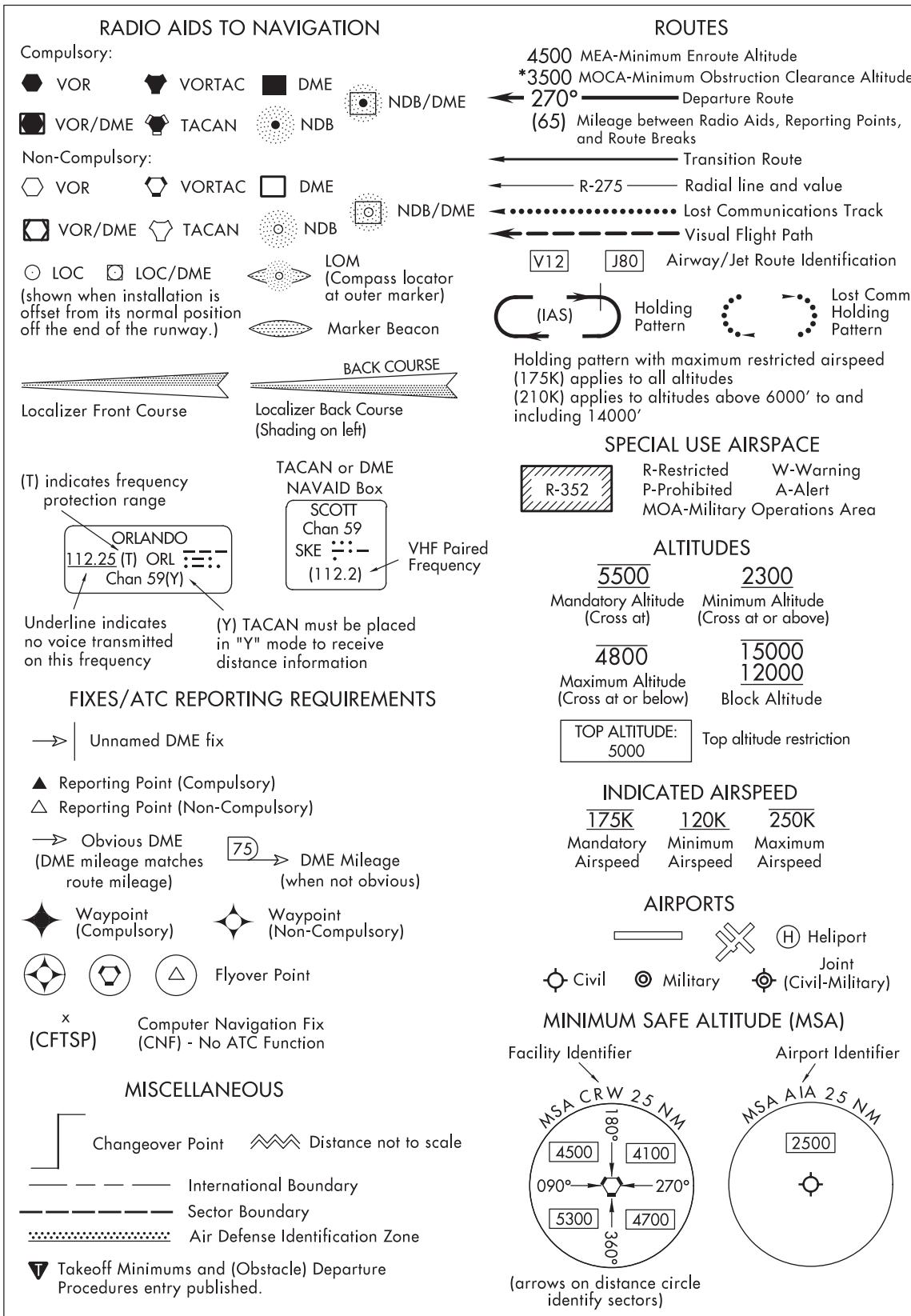
12 JUN 2025 to 07 AUG 2025

12 JUN 2025 to 07 AUG 2025

# DEPARTURE PROCEDURE (DP) CHARTS

LEGEND 23334

## DEPARTURE PROCEDURE (DP) CHARTS



LEGEND 23334

# AIRPORT DIAGRAM/AIRPORT SKETCH

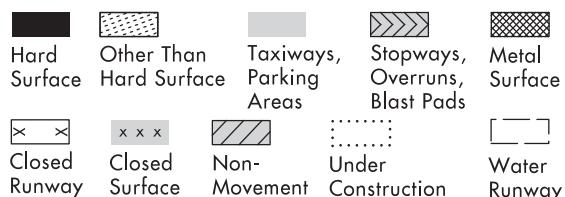
24249

## LEGEND

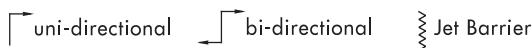
### INSTRUMENT APPROACH PROCEDURES (CHARTS)

#### AIRPORT DIAGRAM/AIRPORT SKETCH

##### Runways



**ARRESTING GEAR:** Specific arresting gear systems; e.g., BAK12, MA-1A etc., shown on airport diagrams, not applicable to Civil Pilots. Military Pilots refer to appropriate DOD publications.



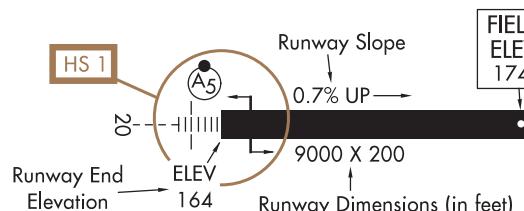
##### REFERENCE FEATURES

Displaced Threshold.....	
Hot Spot .....	
Runway Holding Position Markings.....	
Buildings.....	
Self-Serve Fuel ##.....	
Tanks.....	
Obstructions.....	
Airport Beacon #.....	
Runway Radar Reflectors.....	
Bridges.....	
Control Tower #.....	
Wind Cone.....	
Landing Tee.....	
Tetrahedron.....	

# When Control Tower and Rotating Beacon are co-located, Beacon symbol will be used and further identified as TWR.

## See appropriate Chart Supplement for information.

Runway Weight Bearing Capacity or Pavement Classification Number (PCN)/Pavement Classification Rating (PCR) is shown as a codified expression. Refer to the appropriate Supplement/Directory for applicable codes e.g., RWY 14-32 PCR 560 R/B/W/T; S-75, D-185, 2D-325, 2D/2D2-1120



Helicopter Alighting Areas

Negative Symbols used to identify Copter Procedures landing point.....

**NOTE:**  
Landmark features depicted on Copter Approach insets and sketches are provided for visual reference only.

Runway TDZ elevation..... TDZE 123

Runway Slope..... — 0.3% Down..... 0.8% UP — (shown when rounded runway slope is  $\geq 0.3\%$ )

**NOTE:**  
Runway Slope measured to midpoint on runways 8000 feet or longer.

U.S. Navy Optical Landing System (OLS) "OLS" location is shown because of its height of approximately 7 feet and proximity to edge of runway may create an obstruction for some types of aircraft.

Approach light symbols are shown in the Flight Information Handbook.

Airport diagram scales are variable.

True/magnetic North orientation may vary from diagram to diagram

Coordinate values are shown in 1 or  $\frac{1}{2}$  minute increments. They are further broken down into 6 second ticks, within each 1 minute increments.

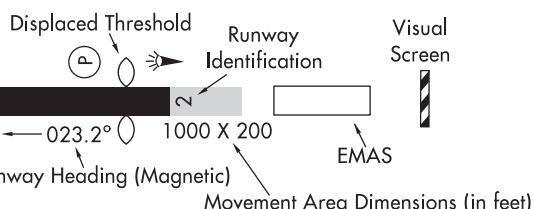
Positional accuracy within  $\pm 600$  feet unless otherwise noted on the chart.

Runway length depicted is the physical length of the runway (end-to-end, including displaced thresholds if any) but excluding areas designated as stopways.

A symbol is shown to indicate runway declared distance information available, see appropriate Chart Supplement for distance information.

**NOTE:**  
All new and revised airport diagrams are shown referenced to the World Geodetic System (WGS) (noted on appropriate diagram), and may not be compatible with local coordinates published in DoD FLIP. (Foreign Only)

The airport sketch box includes the final approach course or final approach course extended.



Airport diagrams are specifically designed to assist in the movement of ground traffic at locations with complex runway/taxiway configurations. Airport diagrams are not intended to be used for approach and landing or departure operations. For revisions to Airport Diagrams: Consult FAA Order 7910.4.

## LEGEND

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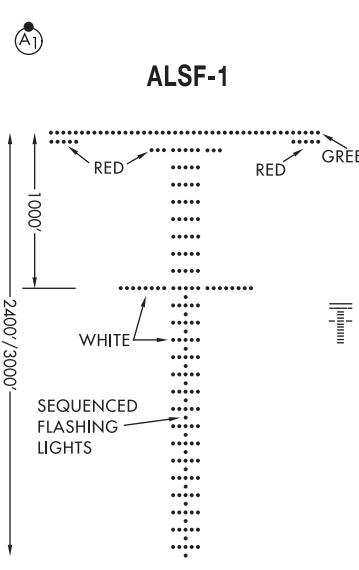
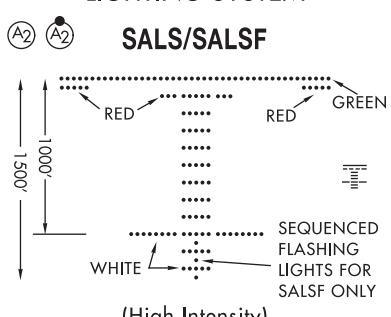
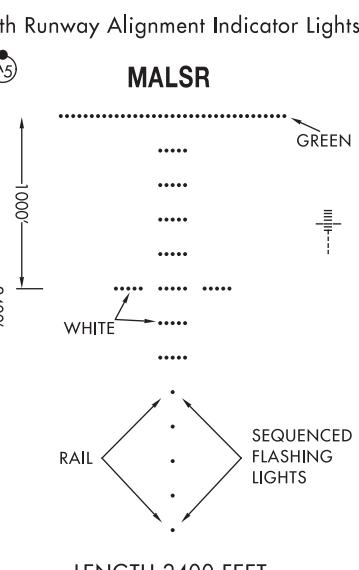
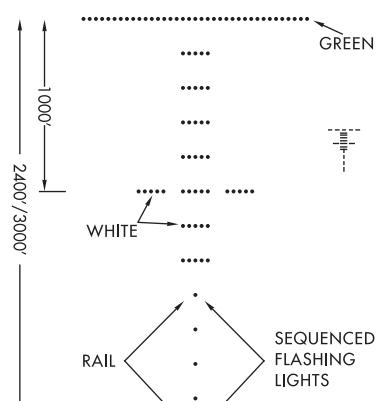
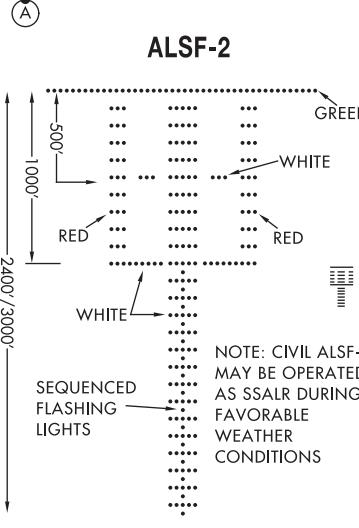
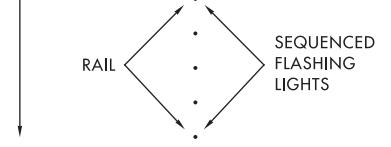
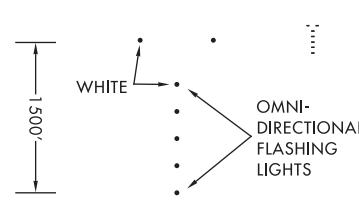
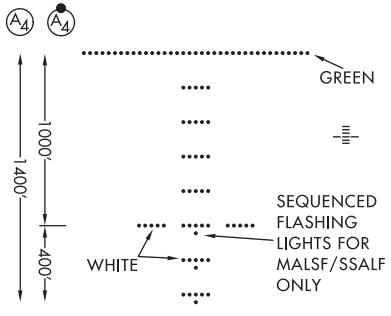
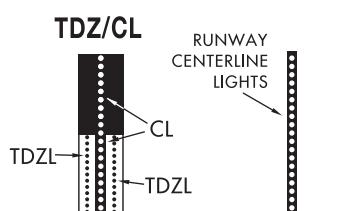
# APPROACH LIGHTING SYSTEM

## LEGEND 22195

## INSTRUMENT APPROACH PROCEDURES (CHARTS) APPROACH LIGHTING SYSTEM - UNITED STATES

Approach lighting and visual glide slope systems are indicated on the airport sketch by an identifier, e.g.,  $\textcircled{A}_2$ ,  $\textcircled{V}$ , etc.

A dot "●" portrayed with approach lighting letter identifier indicates sequenced flashing lights (F) installed with the approach lighting system e.g.,  $\textcircled{A}_1$ . Negative symbology, e.g.,  $\textcircled{A}_1$ ,  $\textcircled{V}$  indicates Pilot Controlled Lighting (PCL).

<b>CATEGORY I APPROACH LIGHTING SYSTEM</b>  <b>ALSF-1</b> (High Intensity) LENGTH 2400/3000 FEET	<b>SHORT APPROACH LIGHTING SYSTEM</b> <b>SALS/SALSF</b>  (High Intensity) LENGTH 1500 FEET	<b>MEDIUM INTENSITY APPROACH LIGHTING SYSTEM</b> with Runway Alignment Indicator Lights <b>MALSR</b>  LENGTH 2400 FEET
	<b>SIMPLIFIED SHORT APPROACH LIGHTING SYSTEM</b> with Runway Alignment Indicator Lights <b>SSALR</b>  (High Intensity) LENGTH 2400/3000 FEET	
<b>CATEGORY II APPROACH LIGHTING SYSTEM</b>  <b>ALSF-2</b> (High Intensity) LENGTH 2400/3000 FEET	 (High Intensity) LENGTH 2400/3000 FEET	<b>OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM</b> <b>ODALS</b>  LENGTH 1500 FEET
	<b>MEDIUM INTENSITY ( MALS and MALSF ) OR SIMPLIFIED SHORT ( SSALS and SSALF ) APPROACH LIGHTING SYSTEMS</b>  LENGTH 1400 FEET	<b>RUNWAY TOUCHDOWN ZONE AND CENTERLINE LIGHTING SYSTEMS</b> <b>TDZ/CL</b>  AVAILABILITY of TDZ/CL will be shown by NOTE in SKETCH e.g. "TDZ/CL Rwy 15"

## LEGEND 22195

# APPROACH LIGHTING SYSTEM (Continued)

**LEGEND** 22195

INSTRUMENT APPROACH PROCEDURES (CHARTS)  
APPROACH LIGHTING SYSTEM - UNITED STATES

Approach lighting and visual glide slope systems are indicated on the airport sketch by an identifier, **(A2)**, **(V)** etc.

A dot "•" portrayed with approach lighting letter identifier indicates sequenced flashing lights (F) installed with the approach lighting system e.g., **(A1)**. Negative symbology, e.g., **(A1)**, **(V)** indicates Pilot Controlled Lighting (PCL).

<p><b>(P)</b> PRECISION APPROACH PATH INDICATOR <b>PAPI</b></p> <p>Legend: □ White ■ Red</p>	<p><b>(V2)</b> PULSATING VISUAL APPROACH SLOPE INDICATOR <b>PVASI</b></p>
<p><b>(V)</b> VISUAL APPROACH SLOPE INDICATOR <b>VASI</b></p> <p>VISUAL APPROACH SLOPE INDICATOR WITH STANDARD THRESHOLD CLEARANCE PROVIDED.</p> <p>ALL LIGHTS WHITE — TOO HIGH FAR LIGHTS RED [NEAR LIGHTS WHITE] — ON GLIDE SLOPE ALL LIGHTS RED — TOO LOW</p>	<p>CAUTION: When viewing the pulsating visual approach slope indicators in the pulsating white or pulsating red sectors, it is possible to mistake this lighting aid for another aircraft or a ground vehicle. Pilots should exercise caution when using this type of system.</p> <p><b>(V4)</b> TRI-COLOR VISUAL APPROACH SLOPE INDICATOR <b>TRCV</b></p> <p>CAUTION: When the aircraft descends from green to red, the pilot may see a dark amber color during the transition from green to red.</p>
<p><b>(V3)</b> VISUAL APPROACH SLOPE INDICATOR <b>VASI</b></p> <p>3-BAR, 6 OR 16 BOX, VISUAL APPROACH SLOPE INDICATOR THAT PROVIDES 2 GLIDE ANGLES AND 2 THRESHOLD CROSSING HEIGHTS.</p>	<p><b>(V5)</b> ALIGNMENT OF ELEMENTS SYSTEMS <b>APAP</b></p> <p>Painted panels which may be lighted at night. To use the system the pilot positions the aircraft so the elements are in alignment.</p>

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**LEGEND** 22195



# REFERENCES

There are several references available from the FAA to aid pilots and other interest parties to learn more about FAA Charts and other aspects of aviation.

Publication		FAA Publication ID
 <b>AERONAUTICAL INFORMATION MANUAL</b>	<p>Aeronautical Information Manual (AIM)</p> <p>URL: <a href="http://www.faa.gov/air_traffic/publications/">http://www.faa.gov/air_traffic/publications/</a></p>	
 <b>Airplane Flying Handbook</b>	<p>Airplane Flying Handbook</p> <p>URL: <a href="https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/airplane_handbook/">https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/airplane_handbook/</a></p>	FAA-H-8083-3A
 <b>Helicopter Flying Handbook</b>	<p>Helicopter Flying Handbook</p> <p>URL: <a href="http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/helicopter_flying_handbook/">http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/helicopter_flying_handbook/</a></p>	FAA-H-8083-21A
 <b>Instrument Procedures Handbook</b>	<p>Instrument Procedures Handbook</p> <p>URL: <a href="http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/instrument_procedures_handbook/">http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/instrument_procedures_handbook/</a></p>	FAA-H-8083-16B
 <b>Instrument Flying Handbook</b>	<p>Instrument Flying Handbook</p> <p>URL: <a href="https://www.faa.gov/sites/faa.gov/files/regulations_policies/handbooks_manuals/aviation/FAA-H-8083-15B.pdf">https://www.faa.gov/sites/faa.gov/files/regulations_policies/handbooks_manuals/aviation/FAA-H-8083-15B.pdf</a></p>	FAA-H-8083-15B
 <b>Pilot's Handbook of Aeronautical Knowledge</b>	<p>Pilot's Handbook of Aeronautical Knowledge</p> <p>URL: <a href="https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/">https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/</a></p>	FAA-H-8083-25B
 <b>Remote Pilot - Small Unmanned Aircraft Systems Study Guide</b> August 2016 Flight Standards Service Washington, DC 20591	<p>Remote Pilot - Small Unmanned Aircraft Systems Study Guide</p> <p>URL: <a href="https://www.faa.gov/sites/faa.gov/files/regulations_policies/handbooks_manuals/aviation/remote_pilot_study_guide.pdf">https://www.faa.gov/sites/faa.gov/files/regulations_policies/handbooks_manuals/aviation/remote_pilot_study_guide.pdf</a></p>	FAA-G-8082-22



# ABBREVIATIONS

## A

AAF - Army Air Field  
 AAS - Airport Advisory Service  
 AAUP - Attention All Users Page  
 AC - Advisory Circular  
 ADF - Automatic Direction Finder  
 ADIZ - Air Defense Identification Zone  
 ADS - Automatic Dependent Surveillance  
 ADS-B - Automatic Dependent Surveillance-Broadcast  
 Advsry - Advisory  
 AFB - Air Force Base  
 AFIS - Automatic Flight Information Service  
 AFS - Air Force Station  
 AFSS - Automated Flight Service Station  
 AGL - Above Ground Level  
 AIM - Aeronautical Information Manual  
 AIRAC - Aeronautical Information Regulation And Control  
 AK - Alaska  
 AL - Approach and Landing  
 ANG - Air National Guard  
 APP - Approach  
 APP CON - Approach Control  
 APP CRS - Approach Course  
 Apt - Airport  
 APV - Approaches with Vertical Guidance  
 ARP - Airport Reference Point  
 ARTCC - Air Route Traffic Control Center  
 ASDA - Accelerate-Stop Distance Available  
 ASDE-X - Airport Surface Detection Equipment-Model X  
 ASOS - Automated Surface Observing Station  
 ASR - Airport Surveillance Radar  
 ATC - Air Traffic Control  
 ATIS - Automatic Terminal Information Service  
 ATS - Air Traffic Service  
 AUNICOM - Automated Aeronautical Advisory Station  
 AWOS - Automated Weather Observing Station

## B

Baro-VNAV - Barometric Vertical Navigation  
 BS - Broadcast Station

## C

CAC - Caribbean Aeronautical Chart  
 CAT - Category  
 CFA - Controlled Firing Areas  
 CFR - Code of Federal Regulations  
 CH - Channel  
 CL - Runway Centerline Lights  
 CLNC DEL - Clearance Delivery  
 CNF - Computer Navigation Fix  
 COP - Changeover Point  
 CPDLC - Controller Pilot Data Link Communication  
 CRS - Course  
 CT - Control Tower

CTAF - Common Traffic Advisory Frequency  
 CVFP - Charted Visual Flight Procedure  
 CZ - Control Zone (Canada)

## D

DA - Decision Altitude  
 DA - Density Altitude  
 D-ATIS - Digital Automatic Terminal Information Service  
 DH - Decision Height  
 DME - Distance Measuring Equipment  
 DND - Department of National Defense (Canada)  
 DoD - Department of Defense  
 DOF - Digital Obstacle File  
 DP - Departure Procedure  
 DT - Daylight Savings Time  
 DVA - Diverse Vector Area

## E

E - East  
 EFAS - Enroute Flight Advisory Service  
 EFB - Electronic Flight Bag  
 Elev - Elevation  
 EMAS - Engineered Materials Arresting System

## F

FAA - Federal Aviation Administration  
 FAF - Final Approach Fix  
 FAP - Final Approach Point  
 FAR - Federal Aviation Regulation  
 FBO - Fixed-Based Operator  
 FIR - Flight Information Region  
 FL - Flight Level  
 FLIP - Flight Information Publication  
 FMS - Flight Management System  
 FREQ - Frequency  
 FRZ - Flight Restricted Zone  
 FSDO - Flight Standards District Office  
 FSS - Flight Service Station

## G

GBAS - Ground-Based Augmentation System  
 GCO - Ground Communications Outlet  
 GLS - GBAS Landing System  
 GND - Ground  
 GND CON - Ground Control  
 GNSS - Global Navigation Satellite System  
 GP - Glide Path  
 GPS - Global Positioning System  
 GS - Glide Slope  
 GS - Ground Speed

**H**

HAA - Height Above Airport  
 HAR - High Altitude Redesign  
 HAT - Height Above Touchdown  
 HCH - Heliport Crossing Height  
 HF - High Frequency  
 HIRL - High Intensity Runway Lights  
 HS - Hot Spot

**I**

IAC - Interagency Air Committee  
 IACC - Interagency Air Cartographic Committee  
 IAF - Initial Approach Fix  
 IAP - Instrument Approach Procedure  
 ICAO - International Civil Aviation Authority  
 IDT - Identifier  
 IF - Intermediate Fix  
 IFR - Instrument Flight Rules  
 ILS - Instrument Landing System  
 IMC - Instrument Meteorological Conditions  
 INS - Inertial Navigation System  
 IR - Instrument Route (Military)  
 IRU - Inertial Reference Unit

**J**

JO - Joint Order

**K**

KIAS - Knots

**L**

LAA - Local Airport Advisory  
 LAAS - Local Area Augmentation System  
 LAHSO - Land and Hold Short  
 LDA - Landing Distance Available  
 LDA - Localizer-type Directional Aid  
 Ldg - Landing  
 LF - Low Frequency  
 LIRL - Low Intensity Runway Lights  
 LNAV - Lateral Navigation  
 LOC - Localizer  
 LOM - Locator Outer Marker  
 LPV - Localizer Performance with Vertical Guidance  
 LRRS - Long Range Radar Station  
 LTP - Landing Threshold Point

**M**

MAA - Maximum Authorized Altitude  
 MAP - Missed Approach Point  
 MCA - Minimum Crossing Altitude  
 MCAS - Marine Corps Air Station  
 MDA - Minimum Descent Altitude  
 MDH - Minimum Descent Height

MEA - Minimum Enroute Altitude  
 MEF - Maximum Elevation Figure  
 MF - Medium Frequency  
 MIA - Minimum IFR Altitude  
 MIRL - Medium Intensity Runway Lights  
 MOA - Military Operations Areas  
 MOCA - Minimum Obstruction Clearance Altitude  
 MON - Minimum Operational Network  
 MORA - Minimum Off-Route Altitude  
 MRA - Minimum Reception Altitude  
 MSA - Minimum Safe Altitude  
 MSL - Mean Sea Level  
 MTA - Minimum Turning Altitude  
 MTR - Military Training Route  
 MVA - Minimum Vector Altitude

**N**

N - North  
 N/A - Not Applicable  
 NA - Not Authorized  
 NAAS - Naval Auxiliary Air Station  
 NAS - Naval Air Station  
 NAS - National Airspace System  
 NAV - Naval Air Facility  
 NAVAID - Navigational Aid (Ground based)  
 NDB - Non-Directional Radiobeacon  
 NextGen - Next Generation Air Transportation System  
 NFDC - National Flight Data Center  
 NFPO - National Flight Procedures Office  
 NM - Nautical Mile  
 NOAA - National Oceanic and Atmospheric Administration  
 NO A/G - No Air-to-Ground Communication  
 NOTAM - Notice to Airmen  
 NoPT - No Procedure Turn  
 NPA - Non-Precision Approach  
 NWS - National Weather Service

**O**

OAT - Outside Air Temperature  
 OBS - Omni Bearing Selector  
 OCA - Ocean Control Area  
 OCS - Obstacle Clearance Surface  
 ODP - Obstacle Departure Procedure  
 OM - Outer Marker  
 OROCA - Off Route Obstruction Clearance Altitude

**P**

PA - Precision Approach  
 PAR - Precision Approach Radar  
 PBN - Performance-Based Navigation  
 PRM - Precision Runway Monitor  
 PT - Procedure Turn  
 PTP - Point-to-Point  
 Pvt - Private

**R**

R - Radial  
 R - Receive  
 R - Restricted Area (Special Use Airspace)  
 RCO - Remote Communications Outlet  
 RF - Radius-to-Fix  
 RNAV - Area Navigation  
 RNP - Required Navigation Performance  
 RNP AR - Required Navigation Performance Authorization Required  
 ROC - Required Obstacle Clearance  
 RP - Right Pattern  
 RVR - Runway Visual Range  
 RVSM - Reduced Vertical Separation Minimum  
 Rwy - Runway

**S**

S - South  
 SAAAR - Special Aircraft and Aircrew Authorization Required  
 SAAR - Special Aircraft and Aircrew Requirements  
 SATNAV - Satellite Navigation  
 SDF - Simplified Directional Facility  
 SER - Start End of Runway  
 SFAR - Special Flight Rules Area  
 SFC - Surface  
 SFRA - Special Flight Rules Area  
 SIAPs - Standard Instrument Approach Procedures  
 SID - Standard Instrument Departure  
 SM - Statute Mile  
 SMAR - Special Military Activity Routes  
 SMGCS - Surface Movement Guidance and Control System  
 SOIA - Simultaneous Offset Instrument Approaches  
 SSV - Standard Service Volume  
 STAR - Standard Terminal Arrival Procedure  
 SUA - Special Use Airspace  
 SVFR - Special Visual Flight Rules

**T**

T - Transmit  
 TA - Travel Advisory  
 TAA - Terminal Arrival Area  
 TAC - Terminal Area Chart  
 TACAN - Tactical Air Navigation  
 TAS - True Air Speed  
 TCA - Terminal Control Areas (Canada)  
 TCH - Threshold Crossing Height  
 TDZ - Touchdown Zone  
 TDZE - Touchdown Zone Elevation  
 TDZL - Touchdown Zone Lights  
 TDZ/CL - Touchdown Zone/Centerline Lights  
 TERPS - U.S. Standard for Terminal Instrument Procedures  
 TFR - Temporary Flight Restriction  
 TIBS - Telephone Information Briefing Service  
 TIS-B - Traffic Information Service - Broadcast

TOC - Top of Climb  
 TOD - Top of Descent  
 TODA - Takeoff Distance Available  
 TOGA - Takeoff/Go Around  
 TORA - Takeoff Runway Available  
 TPP - Terminal Procedures Publication  
 TRSA - Terminal Radar Service Area  
 TWR - Tower

**U**

UC - Under Construction  
 UHF - Ultra High Frequency  
 UIR - Upper Information Region  
 UNICOM - Universal Communications  
 U.S. - United States  
 USA - United States Army  
 USAF - United States Air Force  
 USCG - United State Coast Guard  
 UTA - Upper Control Area

**V**

VCOA - Visual Climb Over Airport / Airfield  
 VDA - Vertical Descent Angle  
 VDP - Visual Descent Point  
 VFR - Visual Flight Rules  
 VGSI - Visual Glide Slope Indicator  
 VHF - Very High Frequency  
 VMC - Visual Meteorological Conditions  
 VNAV - Vertical Navigation  
 VOR - VHF Omnidirectional Radio Range  
 VORTAC - VHF Omnidirectional Radio Range/Tactical Air Navigation  
 VPA - Vertical Path Angle  
 VR - Visual Route (Military)

**W**

W - Warning Area (Special Use Airspace)  
 W - West  
 WAAS - Wide-Area Augmentation System  
 WAC - World Aeronautical Chart  
 WP - Waypoint  
 WX CAM - Weather Camera (Alaska)