



**Federal Aviation  
Administration**

**Aeronautical Information Services**

# **Aeronautical Chart Users' Guide**

## **IFR Enroute Charts**

**Effective as of 17 June 2021**



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# WHAT'S NEW?

*Update as of 17 June 2021*

The following charting items have been added to the Chart Users' Guide since the Guide was last published on 22 April 2021:

## **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)**

A new subsection was added to describe Area Navigation (RNAV) Waypoints and associated Required Navigation Performance (RNP) requirement/capability notes.

In the near future, Minimum Safe Altitude (MSA) information will be included on Departure Procedures (DPs). In preparation for this change, an update was made to the TPP legend for DPs and Standard Terminal Arrival (STAR) charts. The previously combined legends have been split into separate legend pages, and the new DP legend now includes sample MSA information.



# 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, and 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 in detail, 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).

The Notices to Airmen Publication (NOTAM) includes current Flight Data Center (FDC) NOTAMs. NOTAMs alert pilots of new regulatory requirements and reflect changes to Standard Instrument Approach Procedures (SIAPs), flight restrictions, and aeronautical chart revisions. This publication is prepared every 28 days by the FAA, and is available by subscription from the Government Printing Office. For more information on subscribing or to access online PDF copy, go to [https://www.faa.gov/air\\_traffic/publications/notices/](https://www.faa.gov/air_traffic/publications/notices/).

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 **17 June 2021**. 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.

The Chart Users' Guide is updated as necessary when there is new chart symbology or changes in the depiction of information and/or symbols on the charts. When there are changes, it will be in accordance with the 56-day aeronautical chart product schedule.

## 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.

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1305 East-West Highway  
SSMC4, Room 3424  
Silver Spring, MD 20910-3281*

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Aeronautical Inquires: [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/)*



# 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 which 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:

### LOW/HIGH ALTITUDE



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

**Green** - Airports which 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

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	
<p>Low Altitude</p>	<p>High Altitude - U.S.</p>
<p>High Altitude - Alaska</p>	<p>Lighting Available</p> <p style="text-align: center;">L</p> <p>Pilot Controlled Lighting</p> <p style="text-align: center;">Ⓛ</p>
<p>Lighting Available</p> <p style="text-align: center;">L</p> <p>Pilot Controlled Lighting</p> <p style="text-align: center;">Ⓛ</p>	<p>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.</p> <p>7. Airport Ident ICAO Location Indicator shown outside contiguous U.S.</p> <p>8. AFIS Alaska only</p> <p>Part-time or on request</p> <p style="text-align: center;">★</p> <p>No lighting available At private facilities- indicates no lighting information is available</p> <p style="text-align: center;">-</p>
<p><b>LIGHTING CAPABILITY</b></p>	

A **L** symbol between the airport elevation and runway length means that runway lights are in operation sunset to sunrise. A **Ⓛ** 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 "shut-down" 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	
<b>LOW ENROUTE CHARTS</b>  <i>RCO Frequencies</i> <i>NAVAID Name</i> <i>FREQ, Ident, CH, Morse Code</i> <i>Latitude, Longitude</i> <i>Controlling FSS Name</i>	
<b>HIGH ENROUTE CHARTS</b>  <i>RCO Frequencies</i> <i>NAVAID Name</i> <i>Frequency, Ident, Channel,</i> <i>Latitude, Longitude</i>  <i>Controlling FSS Name</i>	
<b>COMMON ELEMENTS (HIGH AND LOW CHARTS)</b>	
<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>	
<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>	
<b>FREQUENCY PROTECTION</b>  <i>Frequency Protection usable range at 18,000' AGL - 40 NM</i>  <i>Frequency Protection usable range at 12,000' AGL - 25 NM</i>	(L)  (T)
<b>DISTANCE MEASURING EQUIPMENT</b>  <i>Facilities that operate in the "Y" mode for DME reception</i>	(Y)
<b>VOICE COMMUNICATIONS VIA NAVAID</b>  <i>Voice Transmitted</i>  <i>No Voice Transmitted</i>	112.6  <u>111.0</u>
<b>NAVAID SHUTDOWN STATUS</b>	VHF/UHF      LF/MF 
<b>PART TIME OR ON-REQUEST</b>	VHF/UHF      LF/MF ★                      ★

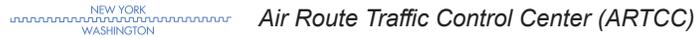
<b>AUTOMATED WEATHER BROADCAST SERVICES</b> <b>ASOS/AWOS</b> - Automated Surface Observing Station/Automated Weather Observing Station	<div style="text-align: center;">         VHF/UHF    LF/MF        <i>Automated weather, when available, is broadcast on the associated NAVAID frequency.</i> </div>
<b>LATITUDE 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>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <b>LOW ENROUTE</b>  </div> <div style="text-align: center;"> <b>HIGH ENROUTE</b>  </div> </div>

## 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.

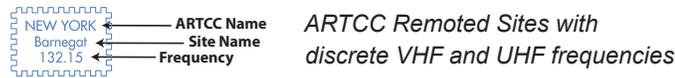
Air Route Traffic Control Centers (ARTCC) are established to provide Air Traffic Control to aircraft operating on IFR flight plans within controlled airspace, particularly during the enroute phase of flight. Boundaries of the ARTCCs are shown in their entirety using the symbol below.



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.



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.



**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.

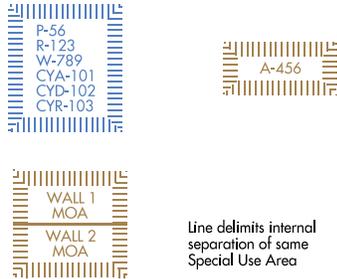
**Class E** Airspace is depicted as open area (white) on the IFR Enroute Low Altitude Charts. It consists of airspace below FL180.

## 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

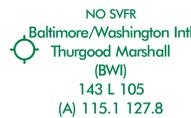
Special Use Airspace (SUA) confines certain flight activities, restricts entry, or cautions other aircraft operating within specific boundaries. SUA areas are shown in their entirety, even when they overlap, adjoin, or when an area is designated within another area. SUA with altitudes from the surface 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	Canada Only	Caribbean Only
P - Prohibited Area	MOA - Military Operations Area	CYA - Advisory	D - Danger
R - Restricted Area	A - Alert Area *	CYD - Danger Area	
W - Warning Area		CYR - Restricted 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 30 NM.



Mode C 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

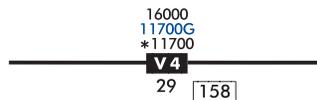
On both series of IFR Enroute Charts, airway/route data such as the airway identifications, magnetic courses bearings or radials, mileages, and altitudes (e.g., Minimum Enroute Altitudes (MEAs), Minimum Reception Altitudes (MRAs), Maximum Authorized Altitudes (MAAs), Minimum Obstacle Clearance Altitudes (MOCAs), 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 which meets obstacle clearance requirements for the entire route segment and which 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.

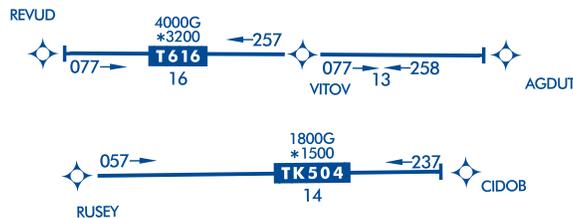


Victor Route (with RNAV/GPS MEA shown in blue)

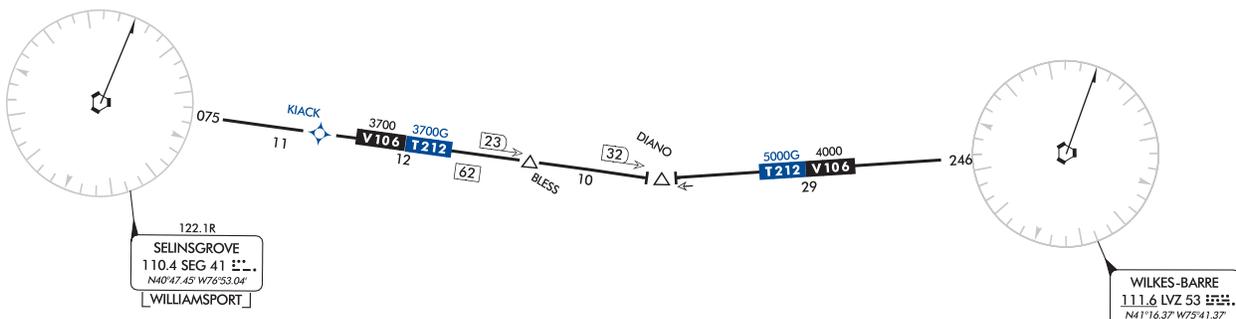
### AREA NAVIGATION (RNAV) "T" ROUTE SYSTEM

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 Air-space 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.

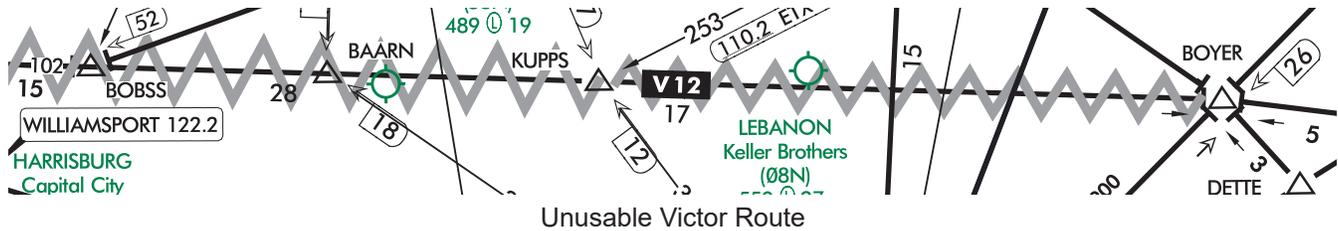


Joint Victor/RNAV routes are charted as outlined above except as noted. The joint Victor route and the RNAV route identification boxes are shown adjacent to each other. Magnetic reference courses are not shown. MEAs are charted above the appropriate identification box or stacked in pairs, GNSS and Victor.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



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. OROCA's 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 represents the highest possible obstruction elevation including both terrain and other vertical obstruction data (towers, trees, etc.) 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. For areas in Mexico and the Caribbean, located outside the U.S. Air Defense Identification Zone (ADIZ), the OROCA provides obstruction clearance with a 3,000 foot vertical buffer. 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 does not provide for NAVAID signal coverage, communication coverage and would not be consistent with altitudes assigned by Air Traffic Control. OROCA's 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) which 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.



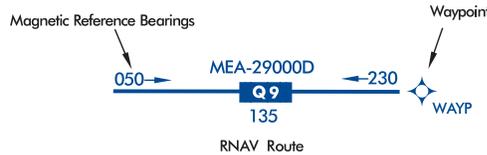
MTRs for particular chart pairs (ex. L1/2, etc.) are alphabetically, then numerically tabulated. The tabulation includes MTR type and unique identification and altitude range.

### 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.



### 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.

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 Alask High Altitude Charts have a minimum hard or soft surface runway of 4000'.

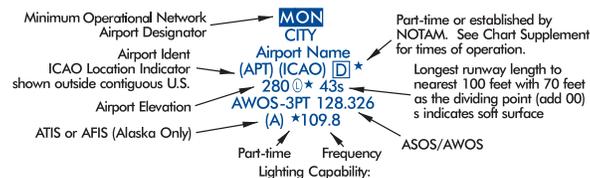
Associated city names for public airports are shown above or preceding the airport name and city name are the same only the airport name is shown. City names for military and private airports are not shown.

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

Pvt - Private Use

## AIRPORT DATA DEPICTION

### Low Altitude



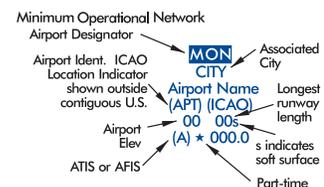
1. Airport elevation given in feet above or below mean sea level
2. Pvt - Private use, not available to general public
3. A solid line box enclosed the airport name indicates FAR 93 Special Requirements - see Directory/Supplement
4. "NO SVFR" above the airport name indicates FAR 91 fixed-wing special 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.



### High Altitude - Alaska



# Airports (Continued)

## LIGHTING CAPABILITY

Lighting Available	L	Part-time or on request	★
Pilot Controlled Lighting	Ⓛ	No lighting available At private facilities- indicates no lighting information is available	-

## RADIO AIDS TO NAVIGATION

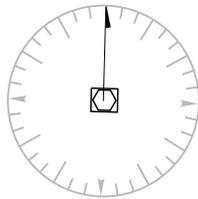
### NAVAIDS

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

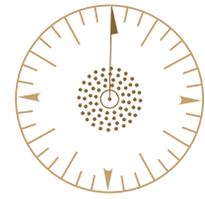
Note: VHF/UHF is depicted in Black. LF/MF is depicted in Brown. RNAV is depicted in Blue

### Compass Roses

#### VHF/UHF



#### LF/MF



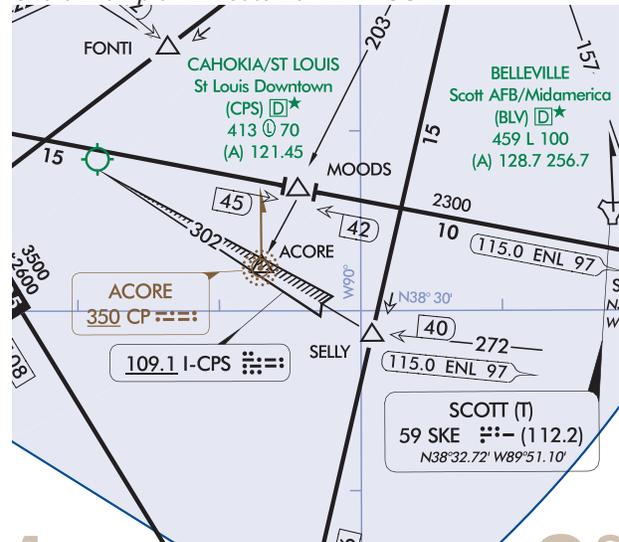
Compass Roses are orientated to Magnetic North of the NAVAID which may not be adjusted to the charted isogonic values.

### Compass Locator Beacon

#### LOW ALTITUDE



Chart Example : Enroute Low L-27 US



# RADIO AIDS TO NAVIGATION (Continued)

## ILS LOCALIZER

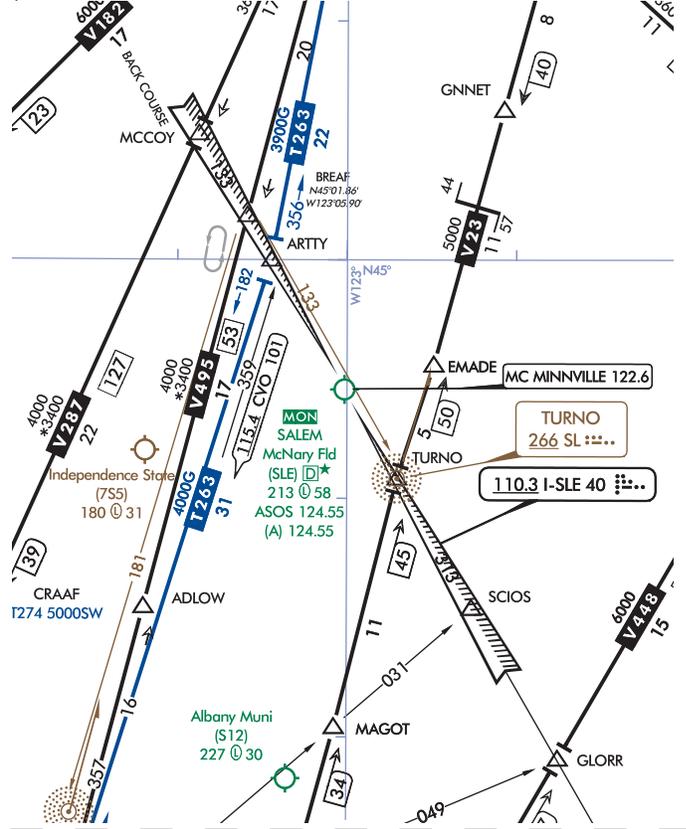
ILS Localizer Course with additional navigation function



ILS Localizer Back Course with additional navigation function

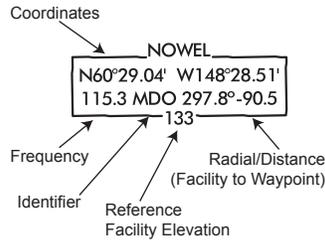


ILS Localizer Example with Back Course  
(Chart: Enroute Low L-1 US)



## HIGH ALTITUDE - ALASKA

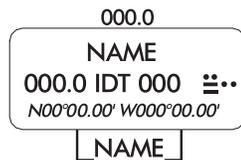
### VOR/DME RNAV WAYPOINT DATA



## NAVIGATION AND COMMUNICATION BOXES - COMMON ELEMENTS

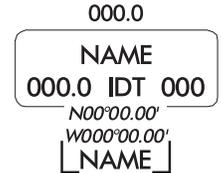
### LOW ENROUTE CHARTS

RCO Frequencies  
NAVAID Name  
FREQ, Ident, CH, Morse Code  
Latitude, Longitude  
Controlling FSS Name



### HIGH ENROUTE CHARTS

RCO Frequencies  
NAVAID Name  
Frequency, Ident, Channel,  
Latitude, Longitude  
Controlling FSS Name



## COMMON ELEMENTS (HIGH AND LOW CHARTS)

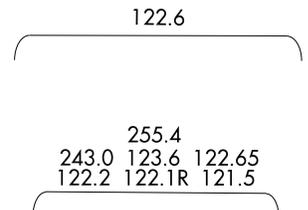
### RCO Frequency

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 NAVAIID boxes without frequency(s) and FSS radio name indicates no FSS frequencies available.

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



# RADIO AIDS TO NAVIGATION (Continued)

## Navigation and Communication Boxes - Common Elements

### Frequency Protection

Frequency Protection usable range at 18,000' AGL - 40 NM

(L)

Frequency Protection usable range at 12,000' AGL - 25 NM

(T)

### 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

### 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

$N00^{\circ}00.00' W000^{\circ}00.00'$

#### HIGH ENROUTE

$N00^{\circ}00.00' W000^{\circ}00.00'$

## Navigation and Communication Boxes - Examples

### LOW ENROUTE CHARTS

#### VOR

R - Receive only 122.1R

Controlling FSS Name - ANDERSON

122.1R  
ALLENDALE  
116.7 AID   
N33°00.79' W81°17.53'  
[ANDERSON]

(T) - Service Volume

POLK (T)  
108.4 FXU

Receive & Transmit on 122.35

(T) - Service Volume

Latitude and Longitude

Controlling FSS Name - MACON

122.35  
TIFT MYERS (T)  
112.5 IFM   
N31°25.72' W83°29.33'  
[MACON]

### HIGH ENROUTE CHARTS

#### VOR

CECIL  
117.9 VQQ  
N30°12.78'  
W81°53.45'

# RADIO AIDS TO NAVIGATION (Continued)

## Navigation And Communication Boxes - Examples (Continued)

### LOW ENROUTE CHARTS

#### VOR/DME

No Voice Communications  
(Y) Mode DME

R - Receive only 122.1R  
Controlling FSS Name - BUFFALO

Shadow NAVAID Box  
FSS Associated with NAVAID

#### TACAN

TACAN Channels are without  
voice but not underlined

Part Time NAVAID

#### VORTAC

Shutdown status

#### DME

DME Channel, Ident, Morse Code,  
VHF Frequency

#### NDB

A - ASOS/AWOS Available

Shutdown status

#### NDB/DME

No Voice Communications  
(Y) Mode DME

Shadow NAVAID Box  
FSS Associated with NAVAID

Notes:

### HIGH ENROUTE CHARTS

#### VOR/DME

Off Route (Greyed NAVAID Box  
and NAVAID)

Service Volume - L  
DME in Y Mode

Shadow NAVAID Box  
FSS Associated with NAVAID

#### TACAN

Off Route

Off Route - Part Time NAVAID  
(Greyed NAVAID Box and NAVAID)  
Service Volume - L

#### VORTAC

Off Route (Greyed NAVAID Box  
and NAVAID)  
Service Volume - L

#### DME

DME Channel, Ident,  
VHF Frequency

#### NDB

#### NDB/DME

No Voice Communications  
(Y) Mode DME

Shadow NAVAID Box  
FSS Associated with NAVAID

Notes: 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. Frequencies 122.2 and 255.4 (Conterminous U.S.); 121.5, 122.2, 243.0 and 255.4 (Alaska); and 121.5, 126.7, and 243.0 (Canada) 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:

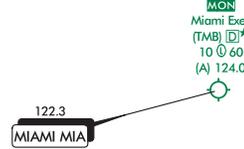
- R - Receive Only
- T - Transmit Only

### LOW CHARTS

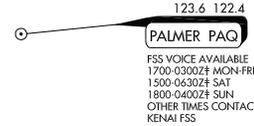
Stand Alone FSS



Stand Alone FSS Associated with an Airport



Part-time FSS



Stand Alone FSS within Canadian Airspace

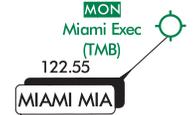


### HIGH CHARTS

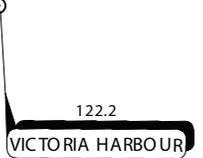
Stand Alone FSS



Stand Alone FSS Associated with an Airport



Stand Alone FSS within Canadian Airspace

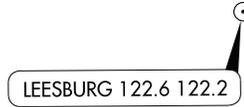


### Remote Communications Outlet (RCO)

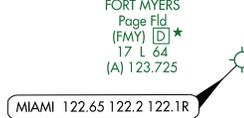
Thin line NAVAID boxes without frequencies and controlling FSS name indicate no FSS frequencies available. Frequencies positioned above the thin line boxes are remoted to the NAVAID sites. Other frequencies at the controlling FSS named are available, however altitude and terrain may determine their reception.

In Canada, a "D" after the frequency indicates a dial-up remote communications outlet.

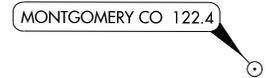
Stand Alone RCO



RCO Associated/Co-located with an Airport



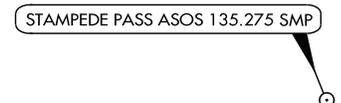
Stand Alone RCO



RCO Associated/Co-located with an Airport



### Stand Alone AWOS & ASOS



# AIRSPACE INFORMATION

## Airway/Route Types

### Low and High Enroute Airway Data:

VHF/UHF Data is depicted in Black.  
 LF/MF Data is depicted in Brown.  
 RNAV Route data is depicted in Blue

#### Low Enroute Charts

**Victor Airways** 

**LF/MF Airway** 

**Uncontrolled LF/MF Airway** 

**RNAV T Route** 

GNSS Required

**RNAV TK Helicopter Route** 

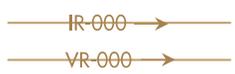
GNSS Required

**Preferred Single Direction Victor Route** 

**Unusable Route Segment** 

**Direction of Flight Indicator Canadian Routes Only** 

**Military Training Routes (MTR)**

MTRs 5NM or less both sides of centerline 

MTRs greater than 5NM either or both sides of centerline 

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

#### High Enroute Charts

**Jet Routes** 

**Atlantic Routes** 

**Bahama Routes** 

**RNAV Q Routes** 

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 Single Direction Jet Routes** 

**Preferred Single Direction RNAV Q Routes** 

**Single Direction ATS Route** 

**Unusable Route Segment** 

#### Low and High Enroute Charts

**ATS Route** 

**Oceanic Route** 

#### Substitute Route

All relative and supporting data shown in brown.



See NOTAMS or appropriate publication for specific information.

# Airspace Information (Continued)

## FIXES

VHF/UHF

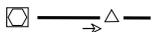


LF/MF



N25°46.47'  
W76°16.28'

N29°36.00'  
W88°01.00'



VHF/UHF



VHF/UHF

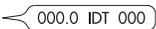
229

LF/MF

149

54

125



N/A

N/A



N/A

N/A

## REPORTING FUNCTION

**Compulsory Position Reporting**

**Non-Compulsory Position Reporting**

**Fix or Waypoint Coordinates**

Fix Coordinates are shown for compulsory, offshore and holding fixes.

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).

**Off-set arrows indicate facility forming a fix**

- Arrow points away from the VHF/UHF NAVAID
- Arrow points towards the LF/MF NAVAID

**Distance Measuring Equipment (DME) Fix**

Denotes DME fix (distance same as airway / route mileage)

**Distance Measuring Equipment (DME) Fix**

Denotes DME fix (encircled mileage shown when not otherwise obvious)

**Example:**

First segment, 5NM; second segment 10NM; total mileage provided in encircled DME arrow.

**Total Mileages between Compulsory Reporting Points or NAVAIDs**

Note: All mileages are in Nautical Miles

**MILEAGE BETWEEN OTHER FIXES, NAVAIDS AND/OR MILEAGE BREAKDOWN**

**Mileage Breakdown or Computer Navigation Fix (CNF)**

Five letter identifier in parentheses indicates CNF with no ATC function

**FACILITY LOCATOR BOATS**

Crosshatch indicates Shutdown status of NAVAID

**RADIAL OUTBOUND FROM A VHF/UHF NAVAID**

All Radials are magnetic.

**BEARING INBOUND TO AN LF/MF NAVAID**

All Bearings are magnetic.

**MAGNETIC REFERENCE BEARING**, outbound from a NAVAID or Fix

Note: Not shown on joint Victor/RNAV or Jet/RNAV Routes.

## WAYPOINTS

RNAV



N44°25.36'  
W64°11.00'

N/A

N/A

RNAV

N/A

N/A

RNAV

N/A

125

N/A

N/A

N/A

N/A

000 →

# Airspace Information (Continued)

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

FAA Chart Users' Guide - IFR Enroute Symbolology

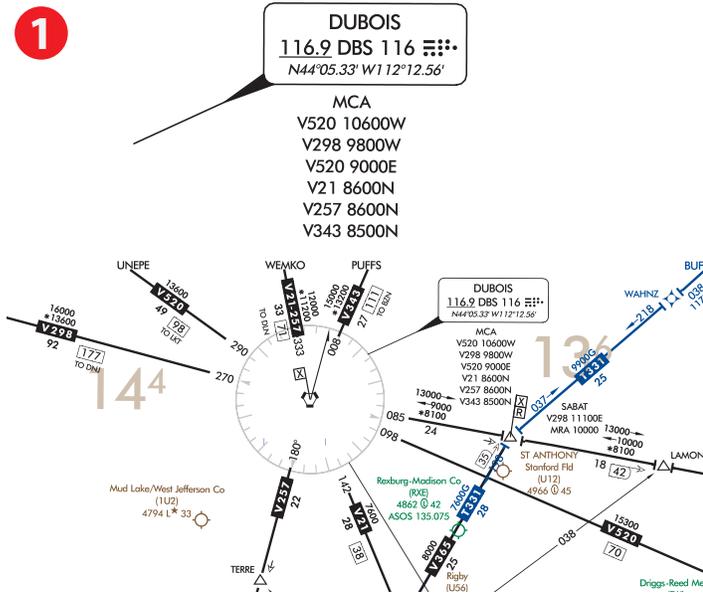


# AIRSPACE INFORMATION (Continued)

## Enroute Chart Examples Low Enroute Chart (Continued)

### Reference Number

### Description

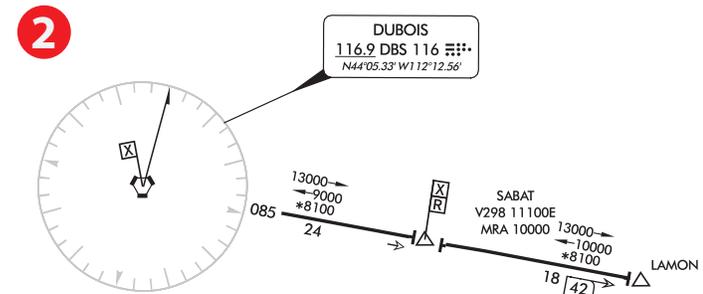


### Multiple MCAs at a NAVAID

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

### MCA and MRA at a Fix

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

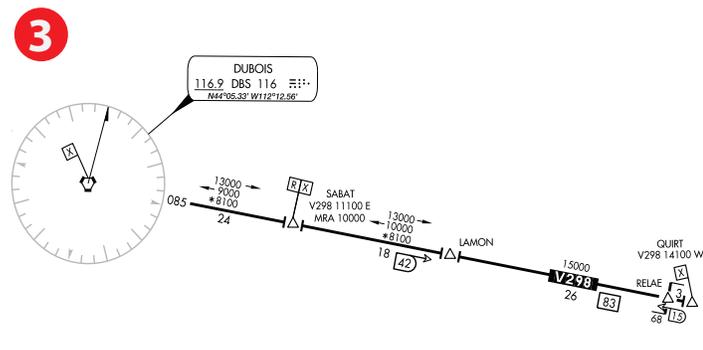


### Example of MOCA and directional MEAs along a Victor Route

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

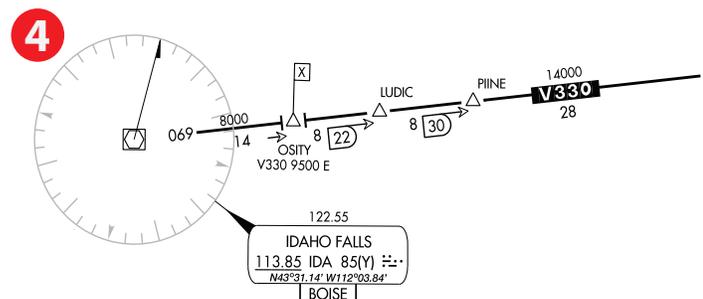
Traveling West from QUIRT, MEA of 15,000' the first segment, MEA of 10,000 the second segment and MEA of 9,000 the third segment.

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



### MCA Example

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



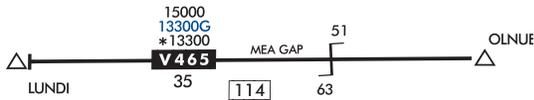
# AIRSPACE INFORMATION (Continued)

## Enroute Chart Examples

### Low Enroute Chart (Continued)

#### Reference Number

5



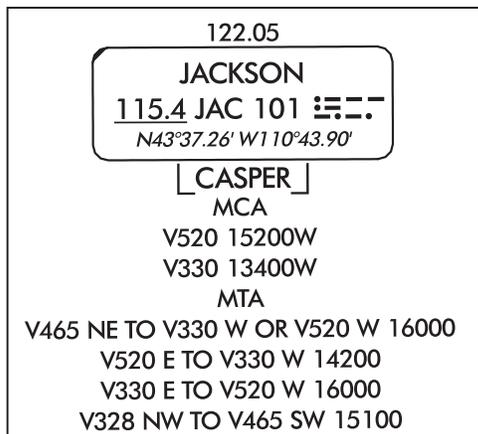
#### Description

##### 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'

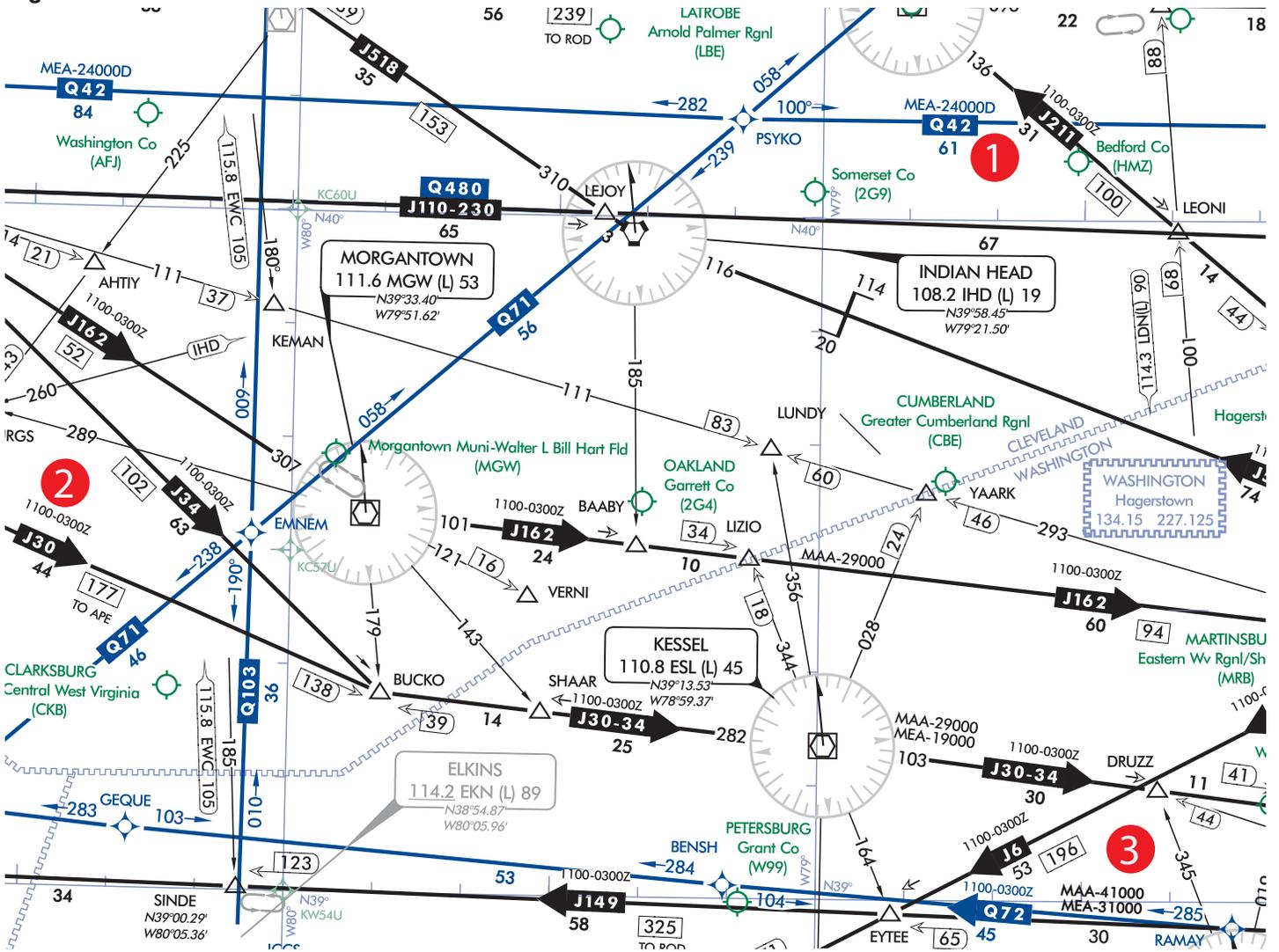
Aircraft traveling E on V330 and turning to V520 on a W heading must turn at altitude of 16000' or higher

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

# Airspace Information (Continued)

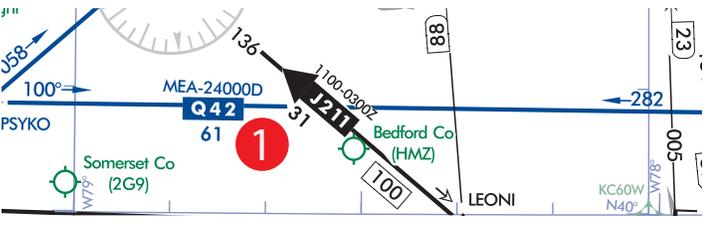
## Enroute Chart Examples

### High Enroute Chart



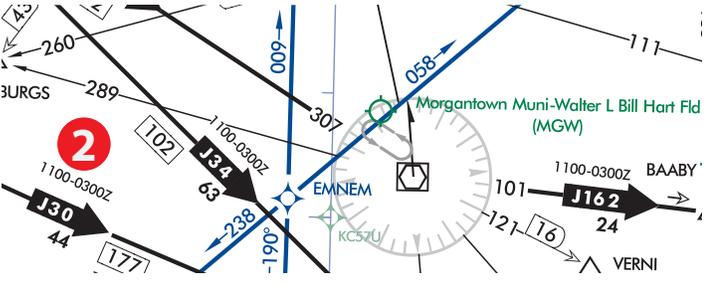
FAA Chart Users' Guide - IFR Enroute Symbolology

#### Reference Number



#### Description

**High RNAV Route with MEA for DME/DME/IRU RNAV Aircraft**  
 MEA of 24,000'



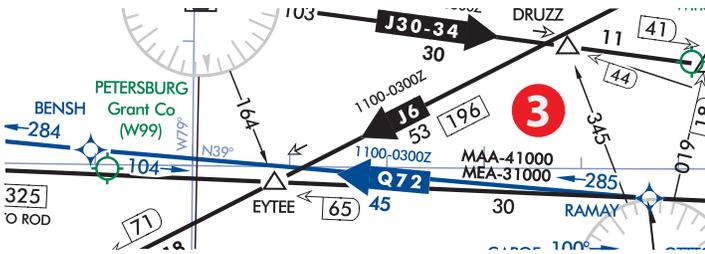
#### Directional Jet Route with Time Restrictions

Jet Route 34 available between 1100 - 0300Z

# AIRSPACE INFORMATION (Continued)

## Enroute Chart Examples High Enroute Chart (Continued)

### Reference Number



### Description

#### 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)

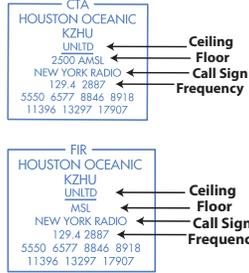
#### LOW / HIGH CHARTS



#### Adjoining ADIZ

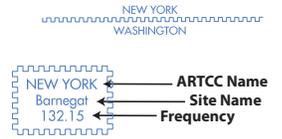
### Air Traffic Service Identification Data

#### LOW / HIGH CHARTS



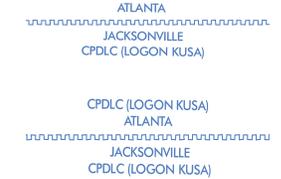
### Air Route Traffic Control Center (ARTCC)

#### LOW / HIGH CHARTS



ARTCC Remoted Sites with discrete VHF and UHF frequencies

### Air Route Traffic Control Center (ARTCC) with Controller Pilot Data Link Communications (CPDLC)



### Altimeter Setting Change



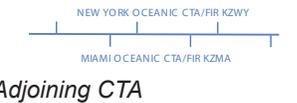
### Flight Information Regions (FIR)

#### LOW / HIGH CHARTS



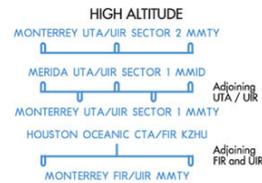
### Control Areas (CTA)

#### LOW / HIGH CHARTS



#### Adjoining CTA

### Upper Information Regions (UIR)



### Upper Control Areas (UTA)

### Additional Control Areas

LOW ALTITUDE



HIGH ALTITUDE



# 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*

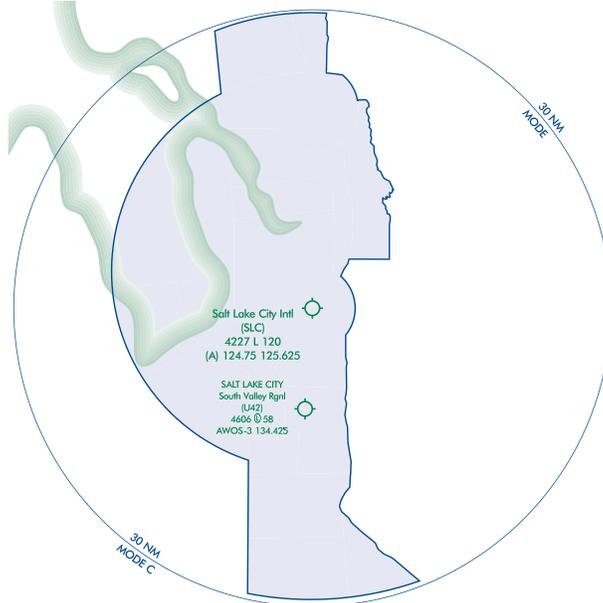
That airspace from 18,000' MSL to and including FL 450, including Santa Barbara Island, Farallon Island, the Alaska peninsula west of longitude 160°00'00" W, and designated offshore areas.

## Class B

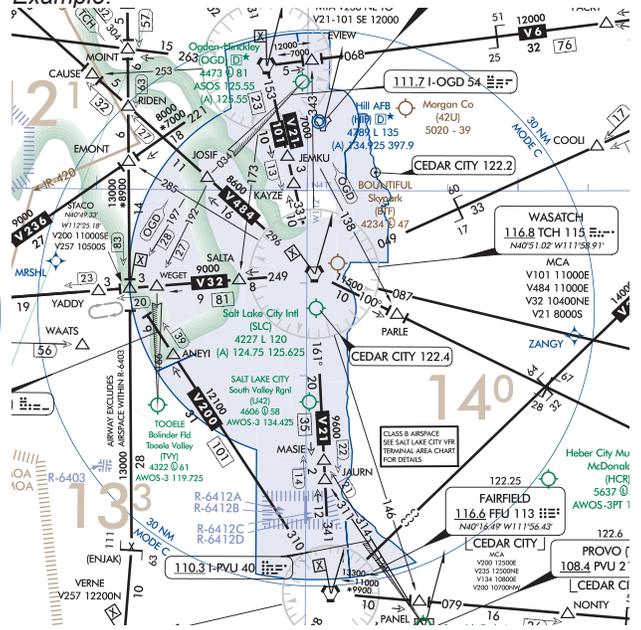
*Screened Blue with a Solid Blue Outline*

*Low Chart Only*

*Controlled Airspace*



*Example:*



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*

*Controlled Airspace*

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

*Example:*

*See Chart example above.*

FAA Chart Users' Guide - IFR Enroute Symbolology

# AIRSPACE INFORMATION (Continued)

## Airspace - U.S. (Continued)

### CLASS C

Screened Blue with a Solid Blue Dashed Outline

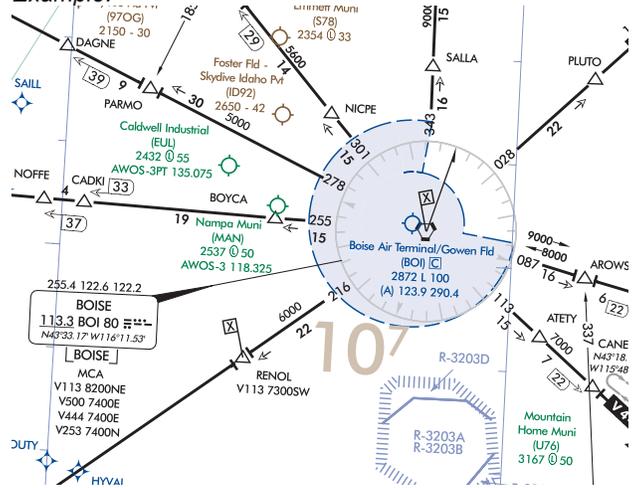
Low Chart Only

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.

Example:

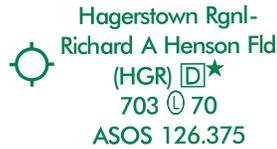


### CLASS D

Open Area (White)

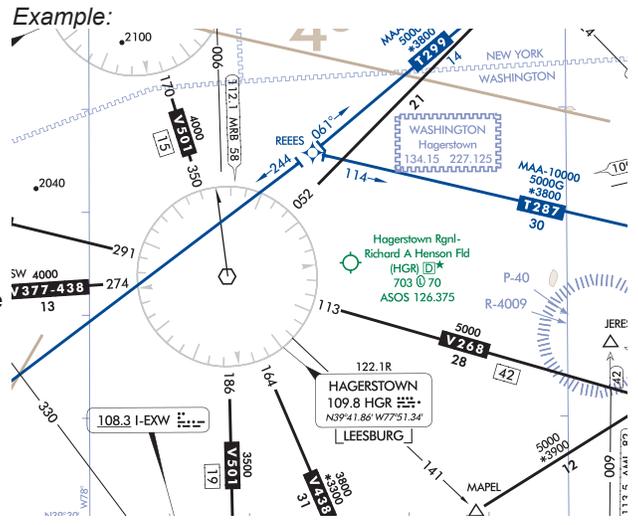
Low Chart Only

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.

Example:



### CLASS E

Open Area (White)

Low Chart Only

Controlled Air-space

That controlled airspace below 14,500' MSL which is not Class B, C or D.

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.

# Airspace Information (Continued)

## AIRSPACE - U.S.

**CLASS G** Screened Brown Area

High and Low Chart

Uncontrolled Airspace



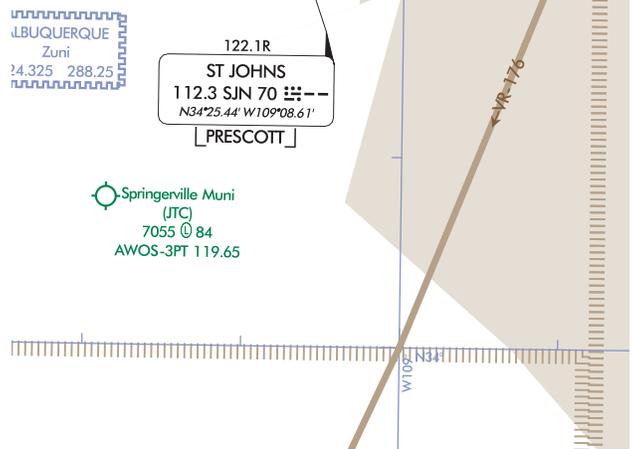
Low Altitude

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:

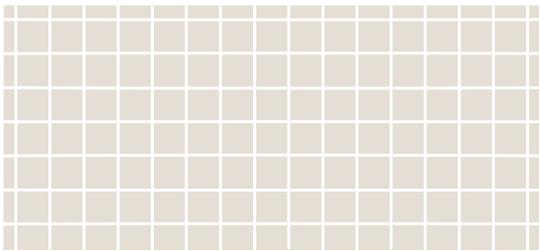


## AIRSPACE - CANADIAN

**CLASS B** Screened Brown Checkered Area

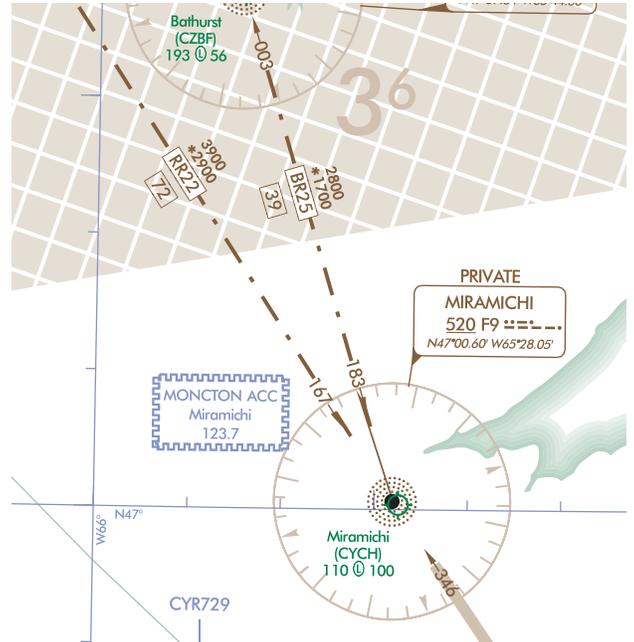
Low Charts Only

Controlled Airspace



Controlled airspace above 12,500' MSL

Example:



# AIRSPACE INFORMATION (Continued)

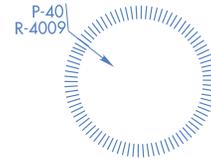
## Special Use Airspace - U.S.

Low and High Charts P - Prohibited Area

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



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



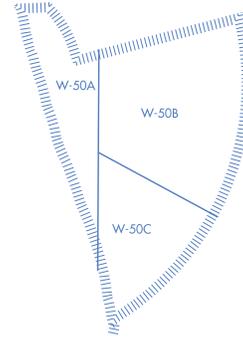
R - Restricted Area

Example: R3601A -



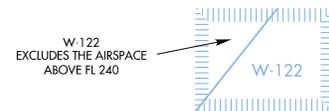
W - Warning Area

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

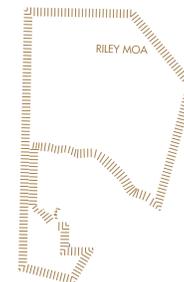
\* Alert Areas do not extend into Class A, B, C and D airspace, or Class E airport surface areas.



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)

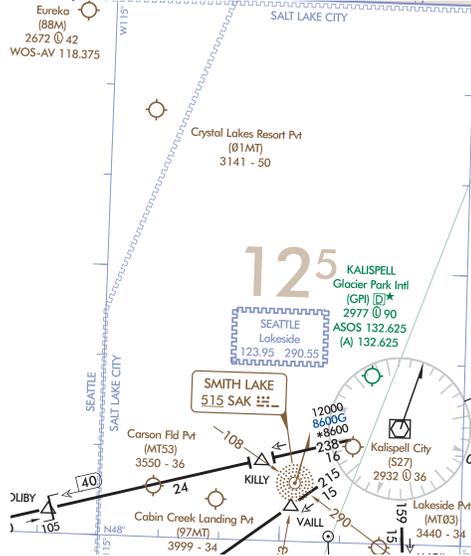
## Off Route Obstruction Clearance Altitude (OROCA)

*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

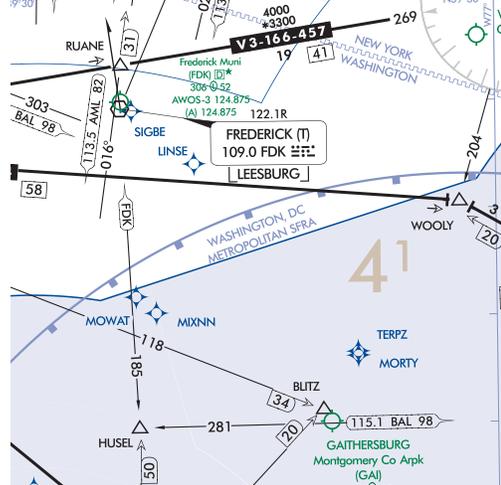


## Special Flight Rules Area (SFRA)

*Low and High Charts* SFRA Symbology



Example: Low Chart (Washington Area Chart)



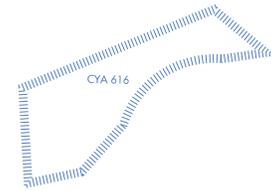
Example: High Chart (H-12)



# AIRSPACE INFORMATION (Continued)

## Special Use Airspace - Canada & Caribbean

Low and High Charts  
 Canada Only  
 CYA - Advisory Area



CYD - Danger Area

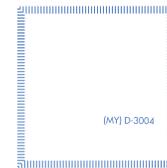


CYR - Restricted Area



Caribbean Only  
 D - Danger Area

In the Caribbean, the first two letters represent the country code, i.e. (MY) Bahamas, (MU) Cuba



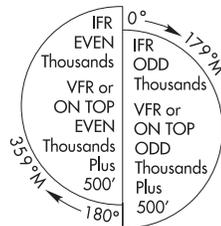
## NAVIGATIONAL AND PROCEDURAL INFORMATION

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

IFR outside controlled airspace.

IFR within controlled airspace as assigned by ATC.

ALL courses are magnetic.



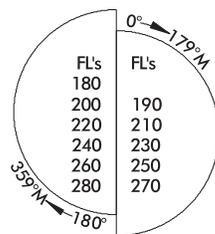
VFR above 3000' AGL unless otherwise authorized by ATC.

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

IFR within controlled airspace as assigned by ATC

All courses are magnetic.

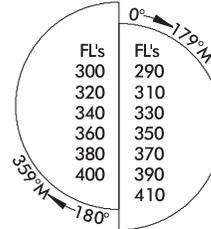
#### 18,000' MSL to FL280



VFR or VFR On Top add 500'

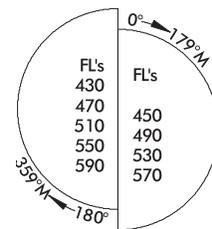
No VFR flights within Class A Airspace above 3000' AGL unless otherwise authorized

#### 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)

## ISOGONIC LINE AND VALUE

## LOW/HIGH CHARTS

## ENLARGEMENT AREA



## MORSE CODE

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 ----		

## TIME ZONE

All time is Coordinated Universal Time (UTC)

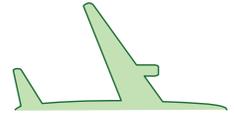
Mountain Std  
+7 = UTC

Central Std  
+6 = UTC

During periods of Daylights Savings Time (DT), effective hours will be one hour earlier than shown. All states observe DT except Arizona and Hawaii

## MATCH MARK

## LOW/HIGH CHARTS

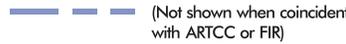


## CULTURE

### Boundaries

#### International

#### LOW/HIGH ALTITUDE



#### U.S./Russia Maritime Line

#### LOW/HIGH ALTITUDE



## HYDROGRAPHY

## SHORELINES



## TOPOGRAPHY

### TERRAIN

Area Charts



## Date Line

#### LOW/HIGH ALTITUDE





# 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
	<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>	
	<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
	<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
	<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
	<p>Instrument Flying Handbook</p> <p>URL: <a href="http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/FAA-H-8083-15B.pdf">http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/FAA-H-8083-15B.pdf</a></p>	FAA-H-8083-15B
	<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
	<p>Remote Pilot - Small Unmanned Aircraft Systems Study Guide</p> <p>URL: <a href="http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/remote_pilot_study_guide.pdf">http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/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  
Advsvy - 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 Airman  
 NoPT - No Procedure Turn  
 NPA - Non-Precision Approach  
 NTAP - Notices to Airman Publication  
 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 Decent 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)