

## EXPLANATION OF IFR ENROUTE TERMS AND SYMBOLS

The discussions and examples in this section will be based primarily on the IFR (Instrument Flight Rule) Enroute Low Altitude Charts. Other IFR products use similar symbols in various colors (see Section 3 of this guide). The chart legends list aeronautical symbols with a brief description of what each symbol depicts. This section will provide a more detailed discussion of some of the symbols and how they are used on IFR charts.

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

### AIRPORTS

All active airports with hard-surfaced runways of 3000' or longer are shown on FAA IFR Enroute Charts. All active airports with approved instrument approach procedures are also shown regardless of runway length or composition. Charted airports are classified according to the following criteria:



**Blue** – Airports with an approved Department of Defense (DoD) Low Altitude Instrument Approach Procedure and/or DoD RADAR MINIMA published in DOD FLIP (Flight Information Publication or the FAA U.S. Terminal Procedures Publication (TPP).

**Green** – Airports and seaplane bases with an approved Low Altitude Instrument Approach Procedure published in the FAA TPP volumes.

**Brown** – Airports and seaplane bases that do not have a published Instrument Approach Procedure.

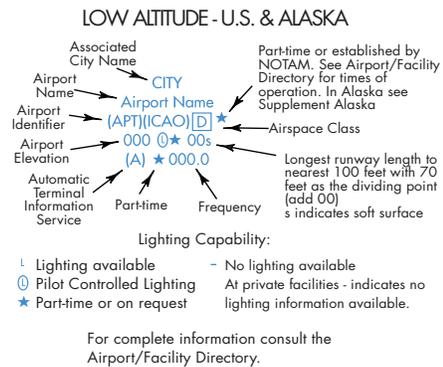
Airports are plotted in their true geographic position unless the symbol conflicts with a radio aid to navigation (NAVAID) at the same location. In such cases, the airport symbol will be displaced, but the relationship between the airport and the NAVAID is retained.

Airports are identified by the airport name. In the case of military airports, the abbreviated letters AFB (Air Force Base), NAS (Naval Air Station), NAF (Naval Air Facility), MCAS (Marine Corps Air Station), AAF (Army Air Field), etc., 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, concrete, and tar macadam. Runways that are not hard-surfaced have a small letter "s" following the runway length, indicating a soft surface.



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 enclosing 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. Airport symbol may be offset for enroute navigational aids.
7. 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.

A L symbol following the elevation under the airport name 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 Airport/Facility Directory for light operating procedures. The Aeronautical Information Manual thoroughly explains the types and uses of airport lighting aids.

### RADIO AIDS TO NAVIGATION (NAVAIDs)

All IFR radio NAVAIDs that have been flight-checked and are operational are shown on IFR enroute charts. VHF/UHF NAVAIDs (VORs, TACANs, and UHF NDBs) are shown in black, and LF/MF NAVAIDs (Compass Locators and Aeronautical or Marine NDBs) are shown in brown.

On 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 all shown in appropriate colors.

NAVAIDs which may be, or are, scheduled for some future corrective action within the life-span of the chart shall be indicated by the note "CHECK NOTAMS". The affected component is indicated by diagonal lines over the frequency or channel which indicates an abnormal status.

**CHECK NOTAMS**

NAME (T) 000.0 IDT 000(Y) ☺☺☺

VOR with TACAN compatible DME

Underline indicates No Voice transmitted on this frequency. TACAN Channels are without voice but not underlined.

Overprint of affected data indicates Abnormal Status, i.e. CHECK NOTAMS/DIRECTORY

(T) Frequency protection usable range at 12,000' AGL - 25NM

(Y) TACAN must be placed in "Y" mode to receive distance information

NAME 000.0 IDT 000 ☺☺☺ (000.0) N00°00.00' W000°00.00'

TACAN Channel paired with VHF Frequency in parenthesis.

Automated Weather Broadcast Systems:

ASOS/AWOS HIWAS TWEB

Automated weather, when available, is broadcast on the associated NAVAID frequency.

NAME ASOS 000.0 Stand Alone ASOS/AWOS

Part-Time or On-Request

NAME 000 IDT 00(000.0) ☺☺☺

LF/MF Non-directional Radiobeacon/DME VHF Freq paired with TACAN Channel

000.0

NAME 000.0 IDT 000 ☺☺☺ N00°00.00' W000°00.00'

NAME ← FSS name

Freq(s) positioned above thin line NAVAID box is remoted to the NAVAID site. Other freq(s) at the controlling FSS named are available, however, altitude and terrain may determine their reception.

Thin line NAVAID boxes without freq(s) and controlling FSS name indicates no FSS freq(s) available.

000.0 000.0

NAME 000.0 IDD 000 ☺☺☺ N00°00.00' W000°00.00'

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

000.0 000.0

NAME IDT

FSS Name and identifier not associated with NAVAID

000.0 000.0

NAME 000.0

Remote Communications Outlet (RCO). FSS name and remoted freq(s) are shown.

SHADOW BOXES indicate Flight Service Stations (FSS). Frequencies 122.2, 255.4 and emergency 121.5 and 243.0 are normally available at all FSSs and are not shown. All other frequencies are shown. Certain FSSs provide Local Airport Advisory (LAA) on 123.6. Frequencies transmit and receive except those followed by R or T: R - Receive only T - Transmit only

**Class A Airspace** is depicted as open area (white) on the Enroute High Charts. It consists of airspace from 18,000 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.

**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 (FAR) 71. Class B and C Airspace are shown in abbreviated forms on 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  following the airport name.

**Class E Airspace** is depicted as open area (white) on the Enroute Low Charts. It consists of airspace below 18,000 MSL.

Airports within which fixed-wing special VFR flight is prohibited are shown as:

NOSVFR AIRPORTNAME

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. Center names are shown adjacent and parallel to the boundary line.

NEW YORK WASHINGTON Air Route Traffic Control Center (ARTCC)

ARTCC sector frequencies are shown in boxes outlined by the same symbol.

WASHINGTON Hagerstown 134.15 385.4 ARTCC Remoted Sites with discrete VHF and UHF frequencies

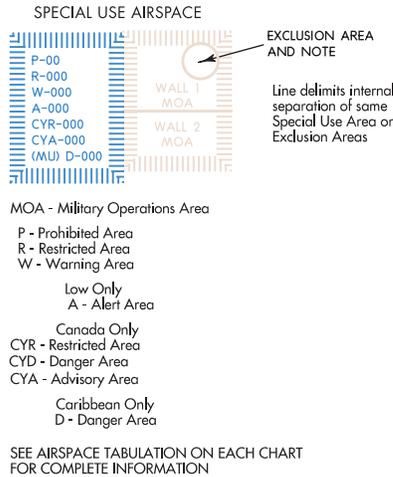
**CONTROLLED AIRSPACE**

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

**SPECIAL USE AIRSPACE**

Special use airspace confines certain flight activities or restricts entry, or cautions other aircraft operating within specific boundaries. Special use airspace areas are depicted on aeronautical charts. Special use airspace areas are shown in their entirety, even when they

overlap, adjoin, or when an area is designated within another area. The areas are identified by type and identifying number or name (R-4001), effective altitudes, operating time, weather conditions (VFR/IFR) during which the area is in operation, and voice call of the controlling agency, on the back or front panels of the chart. Special Use Airspace with a floor of 18,000' MSL or above is not shown on the Enroute Low Altitude Charts. Similarly, Special Use Airspace with a ceiling below 18,000' MSL is not shown on Enroute High Altitude Charts.



**OTHER AIRSPACE**

**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 Enroute Low Altitude Charts. Mode C is also depicted within 10 NM of all airports listed in Appendix D of FAR 91.215 and the Aeronautical Information Manual (AIM).



Mode C is required within the limits of a Class C airspace up to 10,000' MSL.

**INSTRUMENT AIRWAYS**

The FAA has established two fixed route systems for air navigation. The VOR and LF/MF (low or medium frequency) system—designated from 1,200' AGL to but not including 18,000' MSL—is shown on Low Altitude Enroute Charts, and the Jet Route system—designated from 18,000' MSL to FL 450 inclusive—is shown on High Altitude Enroute Charts.

**VOR LF/MF AIRWAY SYSTEM (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

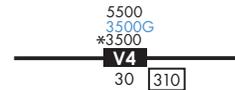
(e.g., "V12"). In Alaska, some segments of low-altitude airways are based on LF/MF navaids and are charted in brown instead of black.

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"). 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. U.S. colored airways exist only in Alaska, those within the conterminous U.S. have been rescinded.

**AIRWAY/ROUTE DATA**

On both series of Enroute Charts, airway/route data such as the airway identifications, bearings or radials, mileages, and altitude (e.g., MEA, MOCA, MAA) are shown aligned with the airway and in the same color as the airway.

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.



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

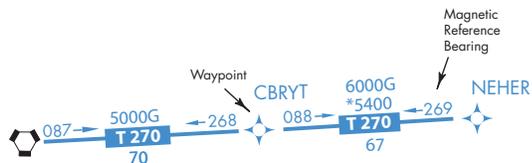
**AREA NAVIGATION (RNAV) "T" ROUTE SYSTEM**

The FAA has created new low altitude area navigation (RNAV) routes for the en route 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 will need to be equipped with IFR approved Global Navigation Satellite System (GNSS). In Alaska, TSO-145a and 146a equipment is required.

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

communications reception. MEAs will be identified with a "G" suffix..

degree quadrant for U.S. Low Altitude Enroute Charts and every two degree by two degree quadrant on Alaska Low Enroute Charts.



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

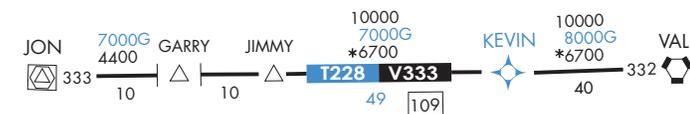
**MILITARY TRAINING ROUTES (MTRs)**

Military Training Routes (MTRs) are routes established for the conduct of low-altitude, highspeed military flight training (generally below 10,000 feet MSL at airspeeds in excess of 250 knots IAS). These routes are depicted in brown on Enroute Low Altitude Charts, and are not shown on inset charts or on IFR Enroute High Altitude Charts. Enroute Low Altitude Charts depict all IR (IFR Military Training Route) and VR (VFR Military Training Route) routes, except those VRs that are entirely at or below 1500 feet AGL.

Military Training Routes are identified by designators (IR-107, VR-134) which are shown in brown on the route centerline. Arrows 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. —IR-000—→

Route segments with a width greater than 5 NM, either or both sides of the centerline, are shown by a .035" line. —VR-000—→



**OFF ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)**

The Off Route Obstruction Clearance Altitude (OROCA) is represented in thousands and hundreds of feet above mean sea level. The OROCA represents the highest possible elevation including both terrain and other vertical obstructions (towers, trees., etc.) bounded by the ticked lines of latitude and longitude. In this example the OROCA represents 12,500 feet.

12<sup>5</sup>

OROCA is computed just as 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. For areas in Mexico and the Caribbean, located outside the U.S. ADIZ, the OROCA provides obstruction clearance with a 3,000 foot vertical buffer. Unlike a MEF, when determining an OROCA the area 4 NM around each quadrant is analyzed for obstructions. 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). OROCA's are shown in every 30 x 30 minute quadrant on Area Charts, every one degree by one

**JET ROUTE SYSTEM (HIGH ALTITUDE ENROUTE CHARTS)**

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

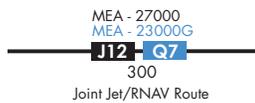
**AREA NAVIGATION (RNAV) "Q" ROUTE SYSTEM (HIGH ALTITUDE ENROUTE CHARTS)**

The FAA has adopted certain amendments to Title 14, Code of Federal Regulations which paved the way for the development of new area navigation (RNAV) 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 Global Positioning System (GPS). RNAV "Q" Route MEAs are shown when other than 18,000'. MEAs for GNSS RNAV aircraft are identified with a "G" suffix. MEAs for DME/DME/IRU RNAV aircraft do not have a

“G” suffix.. RNAV routes and associated data are charted



in aeronautical blue. Magnetic reference bearings 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. Radar monitoring is required. DME/DME/IRU RNAV aircraft should refer to the A/FD for DME information. Altitude values are stacked highest to lowest.



## TERRAIN CONTOURS ON AREA CHARTS

The National Transportation Safety Board (NTSB) recommended that terrain be added to Area Charts to increase pilots' situational awareness of terrain in the terminal area and to increase the safety of flight. When the terrain on an Area Chart rises at least 1000' above the airport elevation, terrain will be depicted in shades of brown. The initial contour value (lowest elevation) depicted will be at least 1000', but no more than 2000' above the airport elevation. The initial contour value may be less than 1000' only if needed to depict a rise in terrain close to the airport. Subsequent contour values will be depicted at a whole 1000' increment (2000'/4000', etc., NOT 2500'/4500', etc.). The following Area Charts are affected: Anchorage, Denver, Fairbanks, Juneau, Los Angeles, Phoenix, Prudhoe Bay, San Francisco and Vancouver.

The following boxed notes are added to affected Area Charts as necessary:

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

UNCONTROLLED AIRSPACE BOUNDARIES ARE DEPICTED WITH A SOLID BROWN LINE AND A .125" WIDE SHADED BROWN BAND. THE SHADED SIDE REPRESENTS THE UNCONTROLLED SIDE