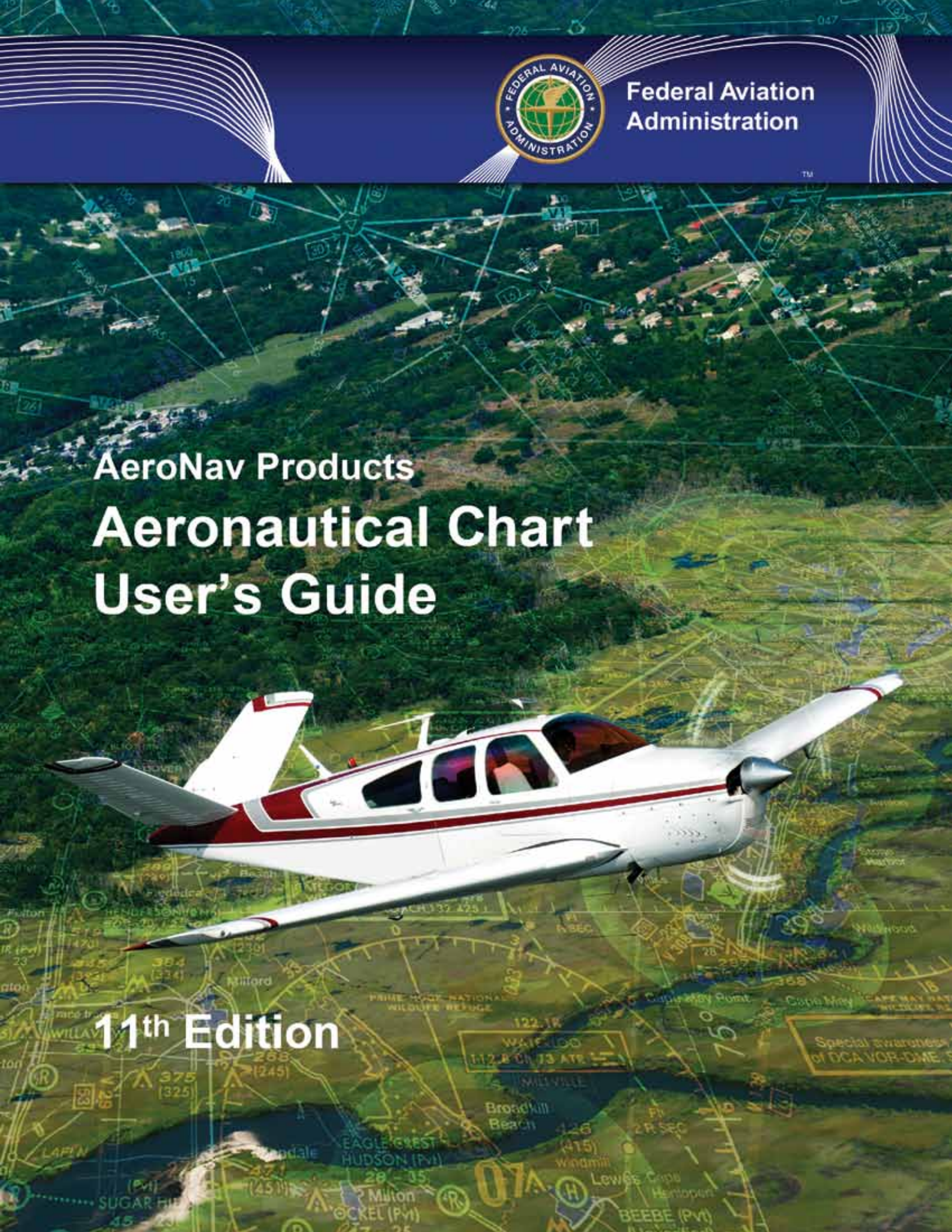
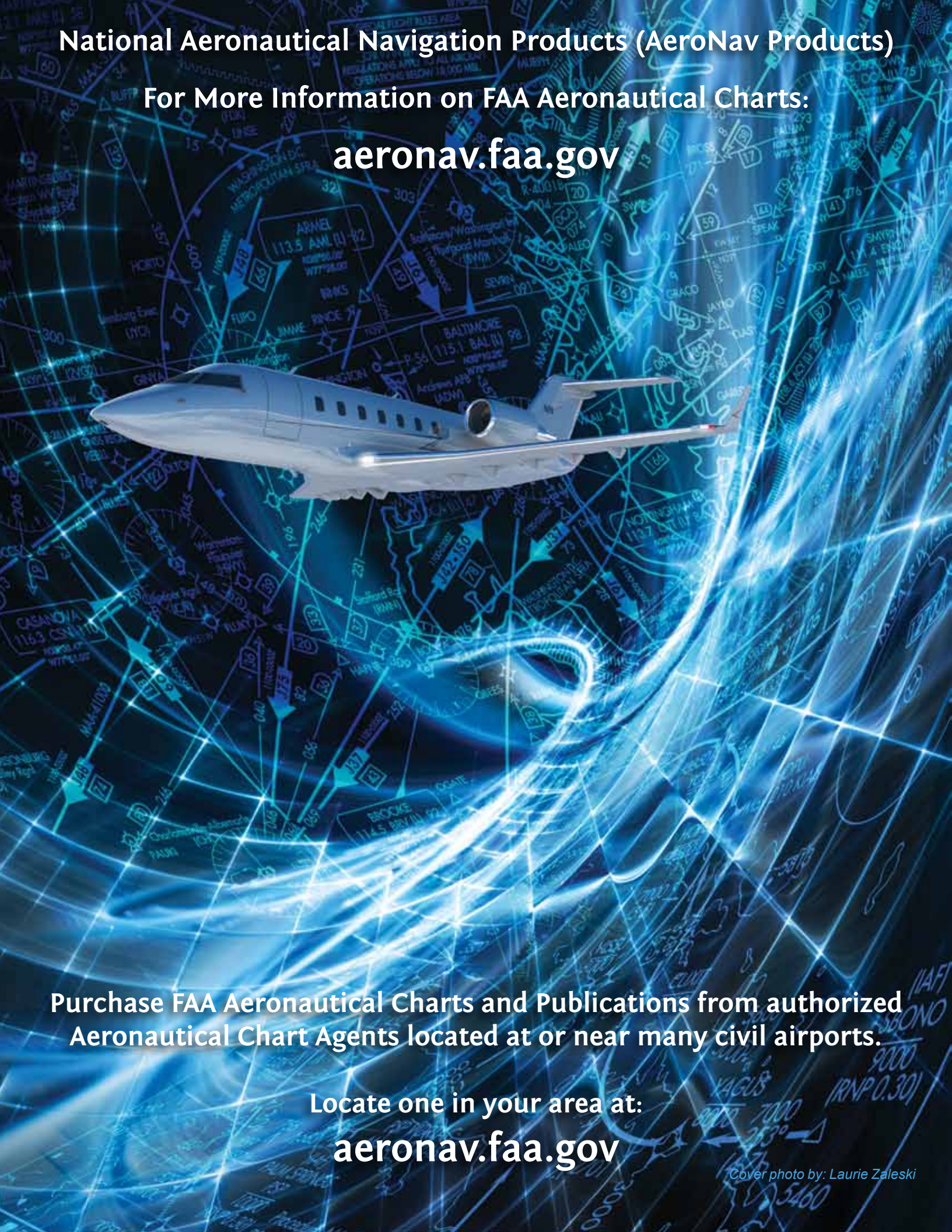
Federal Aviation Administration

AeroNav Products

Aeronautical Chart User's Guide



11th Edition



National Aeronautical Navigation Products (AeroNav Products)

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FAA Aeronautical Chart User's Guide

11th Edition
September 2012

INTRODUCTION

This Chart User's Guide is intended to serve as a learning aid, reference document and an introduction to the wealth of information provided on aeronautical charts and publications of the Federal Aviation Administration's (FAA) AeroNav Products. This guide can also serve as a basic reference of chart information for experienced pilots.

The FAA publishes charts for each stage of VFR (Visual Flight Rules) and IFR (Instrument Flight Rules) flight including training, planning, departure, enroute (low and high altitude), approach, and taxiing. A description of the charts, other aeronautical products and ordering instructions are included in the FAA Aeronautical Chart Catalog, available free upon request from:

FAA/AeroNav Products Logistics Group
10201 Good Luck Road
Glenn Dale, MD 20769-9700

Phone: 301-436-8301 or Toll-Free 1-800-638-8972
Website: aeronav.faa.gov
E-mail: 9-AMC-Chartsales@faa.gov

Terms and abbreviations used in this publication are defined in the FAA Aeronautical Information Manual (AIM) Pilot/Controller Glossary. Unless otherwise indicated, miles are nautical miles (NM), altitudes are in feet above Mean Sea Level (MSL), and times are Coordinated Universal Time (UTC). To be assured of having the most current information, pilots should also refer to other sources such as **Notices to Airmen (NOTAMs)**, Airport/Facility Directory (A/FD) and the Special Notices page of the AeroNav Products website. Chart symbols in this guide are current to June 2012. Graphics contained herein are for illustrational purposes only and should not be used for flight navigation.

USING CURRENT CHARTS

Use of obsolete charts or publications for navigation may be dangerous. Aeronautical information changes rapidly, and it is vitally important that pilots check the effective dates on each aeronautical chart and publication to be used. Obsolete charts and publications should be discarded and replaced by current editions.

To make certain a chart or publication is current, refer to the next scheduled edition date printed on the cover. Pilots should also consult Aeronautical Chart Bulletins in the A/FD or the AeroNav Products Website (aeronav.faa.gov) and NOTAMs for changes essential to the safety of flight that may occur during the effective dates of a chart or publication.

The Notices to Airmen Publication includes current Flight Data Center NOTAMs, which are regulatory in nature and primarily reflect changes to Standard Instrument Approach Procedures (SIAPs), flight restrictions, and aeronautical chart revisions. This publication is prepared every 14 days by the FAA, and is available by subscription from the Government Printing Office.

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Washington, DC 20402-9325

Telephone 202-512-1800 for credit card orders and inquiries.

REPORTING CHART DISCREPANCIES

Every effort is made to ensure that each piece of information shown on AeroNav Products' charts and publications is accurate. Source materials are verified to the maximum extent possible.

You, the pilot, are a valuable source of information. Your feedback is important. You are encouraged to notify FAA/AeroNav Products of any revisions or additions you observe while using our charts and related publications. Should delineation of data be required, mark and clearly explain the discrepancy on a current chart (a replacement copy will be returned to you promptly). Mail the corrected chart to the address below. Suggestions concerning this guide should also be sent to this address:

FAA, AeroNav Products
SSMC4 Sta. #4445
1305 East-West Highway
Silver Spring, MD 20910-3281

Telephone Toll-Free 1-800-626-3677
E-mail: 9-AMC-Aerochart@faa.gov

EXPLANATION OF VFR TERMS AND SYMBOLS

The discussions and examples in this section are based on the Sectional Aeronautical Chart (Sectionals). Sectionals include the most current data and are at a scale (1:500,000) most beneficial to pilots flying under Visual Flight Rules. A pilot should have little difficulty in reading these charts which are, in many respects, similar to automobile road maps. Each chart is named for a major city within its area of coverage.

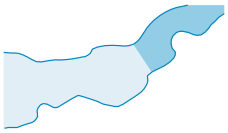
The chart legend lists various aeronautical symbols as well as information concerning drainage, terrain and contour elevations. You may identify aeronautical, topographical, and obstruction symbols (such as radio and television towers) by referring to the legend. Many landmarks which can be easily recognized from the air, such as stadiums, pumping stations, refineries, etc., are identified by brief descriptions adjacent to small black squares marking their exact locations ▪ cabln. Oil wells are shown by small open circles ○ oil. Water, oil and gas tanks are shown by small black circles • water and labeled accordingly, if known. The scale of an item may be increased to make it easier to read on the chart.

AeroNav Products' charts are prepared in accordance with specifications of the Interagency Air Cartographic Committee (IACC) and are approved by representatives of the Federal Aviation Administration (FAA) and the Department of Defense (DoD).

HYDROGRAPHY

Two tones of blue are used to distinguish water areas identified as "Open Water" and "Inland Water."

Open Water is defined as the limits (shorelines) of all coastal features at mean high water for oceans, seas and associated waters such as bays, gulfs, sounds, fords, large estuaries, etc. Exceptionally large lakes such as the Great Lakes, Great Salt Lake, Lake Okeechbee, etc., will be considered as Open Water features. The Open Water tone will be extended inland as far as deemed necessary to adjoin the Inland Water tone (generally where drainage lines coalesce to a width of 0.1" approximate).



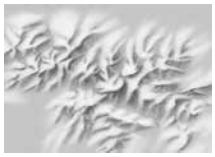
Inland Water is defined as all other bodies of water. Cartographic judgement is used as required in some instances.

TERRAIN AND OBSTRUCTIONS

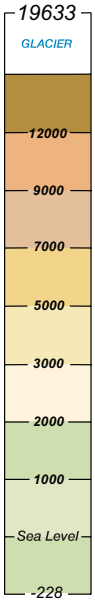
The elevation and configuration of the Earth's surface are certainly of prime importance to pilots. Aeronautical Information Specialists devote a great deal of attention to showing relief and obstruction data in a clear and concise manner. Five different techniques are used: contour lines, shaded relief, color tints, obstruction symbols, and Maximum Elevation Figures (MEF).

1. Contour lines are lines connecting points on the Earth of equal elevation. On Sectionals, basic contours are spaced at 500' intervals. Intermediate contours may also be shown at 250' intervals in moderately level or gently rolling areas. Occasionally, auxiliary contours at 50, 100, 125, or 150' intervals may be used to portray smaller relief features in areas of relatively low relief. The pattern of these lines and their spacing gives the pilot a visual concept of the terrain. Widely spaced contours represent gentle slopes, while closely spaced contours represent steep slopes.

2. Shaded relief is a depiction of how the terrain might appear from the air. The Specialist shades the areas that would appear in shadow if illuminated by a light from the northwest. Studies have indicated that our visual perception has been conditioned to this view.



3. Color tints, also referred to as hypsometric tints, are used to depict bands of elevation relative to sea level. These colors range from light green for the lowest elevations to dark brown for the higher elevations.



4. Obstruction symbols are used to depict man-made vertical features that may affect the National Airspace System. FAA Aeronautical Information Management (AIM) maintains a database of approximately 200,000 obstacles in the United States, Canada, the Caribbean and Mexico. Each obstacle is evaluated by Specialists based on charting specifications before it is added to visual charts. When the position or elevation of an obstacle is unverified, it is marked UC (under construction or reported but not verified).

The data in the Digital Obstacle File (DOF) is collected and disseminated as part of AIM's responsibility for depicting the National Airspace System.

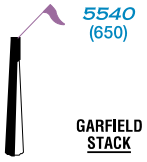
Source data on terrain and obstructions is sometimes not complete or accurate enough for use in aeronautical publications; for example, a reported obstruction may be submitted with insufficient detail for determining the obstruction's position and elevation. Such cases are identified by AIM and investigated by the FAA Flight Edit program.

The FAA Flight Edit crew conducts data verification missions, visually verifying cultural and topographic features and reviewing all obstacle data. Charts are generally flight-checked every four years. This review includes checking for obstructions that may have been constructed, altered, or dismantled without proper notification.

Generally, only man-made structures extending more than 200' above ground level (AGL) are charted on Sectionals and TACs except within yellow city tint. Objects 200' or less are charted only if they are considered hazardous obstructions; for example, an obstruction is much higher than the surrounding terrain or very near an airport. Examples of features considered hazardous obstacles to low level flight are smokestacks, tanks, factories, lookout towers, and antennas. On World Aeronautical Charts (WACs) only obstacles 500' AGL and higher are charted.

Obstacles less than 1000' AGL are shown by the symbol . Obstacles 1000' AGL and higher are shown by the symbol . Man-made features which are used by FAA Air Traffic Control as checkpoints may be represented with pictorial symbols shown in black with the required elevation data in blue.

The elevation of the top of the obstacle above mean sea level (MSL) and the height of the structure AGL are shown when known or when they can be reliably determined by the Specialist. The AGL height is shown in parentheses below the MSL elevation. In extremely congested areas the AGL values may be omitted to avoid confusion.



Obstacles are portrayed wherever possible. Since legibility would be impaired if all obstacles within city complexes or within high density groups of obstacles were portrayed, only the highest obstacle in an area is shown using 4977 (1432), the group obstacle symbol.

Obstacles under construction are indicated by the letters UC nearest to the obstacle type. If space is available, the AGL height of the obstruction is shown in parentheses; for example, (1501). Obstacles with high-intensity strobe lighting systems may operate part-time or by proximity activation and are shown as:

Guy wires may extend outward from obstacles.

5. The Maximum Elevation Figure (MEF) represents the highest elevation, including terrain and other vertical obstacles (towers, trees, etc.), within a quadrant. A quadrant on Sectionals is the area bounded by ticked lines dividing each 30 minutes of latitude and each 30 minutes of longitude. MEF figures are depicted to the nearest 100' value. The last two digits of the number are not shown. In this example the MEF represents 12,500': 125. MEFs are shown over land masses as well as over open water areas containing man-made obstacles such as oil rigs.

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

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

1. Determine the elevation of the top of the obstacle above MSL.

2. Add the possible vertical error of the source material to the above figure (100' or 1/2 contour interval when interval on source exceeds 200'. U.S. Geological Survey Quadrangle Maps with contour intervals as small as 10' are normally used).

3. Round the resultant figure up to the next higher hundred foot level.

Example: Elevation of obstacle top (MSL) =	**2424**
Possible vertical error	**+100**
equals	**2524**
Raise to the following 100' level	**2600**
Maximum Elevation Figure	**26**

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

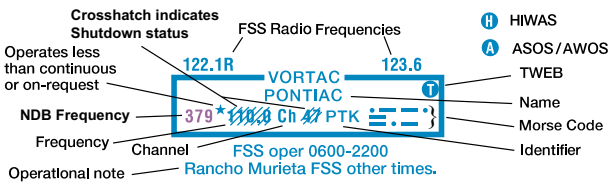
1. Determine the elevation of the feature.
2. Add the possible vertical error of the source to the above figure (100' or 1/2 the contour interval when interval on source exceeds 200').
3. Add a 200' allowance for natural or man made obstacles which are not portrayed because they are below the minimum height at which the chart specifications require their portrayal.
4. Round the figure up to the next higher hundred foot level.

Example: Elevation of obstacle top (MSL) =	**3450**
Possible vertical error	**+100**
Obstacle Allowance	**+200**
equals	**3750**
Raise to the following 100' level	**3800**
Maximum Elevation Figure	**38**

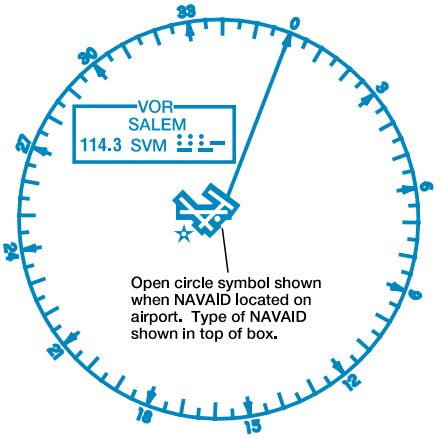
Pilots should be aware that while the MEF is based on the best information available to the Specialist, the figures are not verified by field surveys. Also, users should consult the Aeronautical Chart Bulletin in the A/FD or AeroNav Products website to ensure that your chart has the latest MEF data available.

RADIO AIDS TO NAVIGATION

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



A NAVAID located on an airport depicted by a pattern symbol may not always be shown by the appropriate symbol. A small open circle indicates the NAVAID location when collocated with an airport symbol. The type of NAVAID will be identified by: VORTAC, VOR or VOR-DME, positioned on and breaking the top line of the NAVAID box.



AIRPORTS

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

Public use airports:

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

Military airports:

- Other than hard-surfaced runways

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

U.S. military airports are identified by abbreviations such as AAF (Army Air Field), AFB (Air Force Base), MCAS (Marine Corps Air Station), NAS (Naval Air Station), NAF (Naval Air Facility), NAAS (Naval Auxiliary Air Station), etc. Canadian military airports are identified by the abbreviation DND (Department of National Defense).

Services available:

- Tick marks around the basic airport symbol indicate that fuel is available and the airport is tended during normal working hours (normal working hours are Monday through Friday 10:00 A.M. to 4:00 P.M. local time).

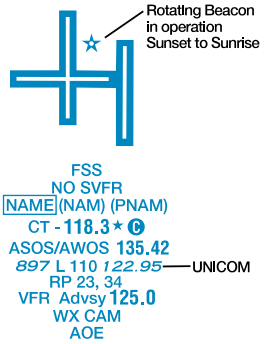
Other airports with or without services:

(H) (F) (U) (R) (⊗)

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

Airports are identified by their designated name. Generic parts of long airport names (such as “airport”, “field” or “municipal”) and the first names of persons are commonly omitted unless they are needed to distinguish one airport from another with a similar name.

The figure at right illustrates the coded data that is provided along with the airport name. The elevation of an airport is the highest point on the usable portion of the landing areas. Runway length is the length of the longest active runway including displaced thresholds and excluding overruns. Runway length is shown to the nearest 100’, using 70 as the division point; a runway 8070’ in length is charted as 81, while a runway 8069’ in length is charted as 80. If a seaplane base is collocated with an airport, there will be additional seaplane base water information listed for the elevation, lighting and runway.



FSS - Flight Service Station on field

NO SVFR - Airports where fixed wing special visual flight rules operations are prohibited (shown above airport name) F.A.R. 91

[ ] - Indicates F.A.R. 93 Special Air Traffic Rules and Airport Traffic Patterns

(NAM) - Location Identifier

(PNAM) - ICAO Location Indicator

CT - 118.3 - Control Tower (CT) - primary frequency

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

C - Follows the Common Traffic Advisory Frequency (CTAF) (Not shown on WAC)

ATIS 123.8 - Automatic Terminal Information Service

AFIS 135.2 - Automatic Flight Information Service

ASOS/AWOS 135.42 - Automated Surface Weather Observing Systems; shown when full-time ATIS is not available. (Not shown on WAC) Some ASOS/AWOS facilities may not be located at airport.

897 - Elevation in feet

L - Lighting in operation Sunset to Sunrise

*L - Lighting limitations exist; refer to Airport/Facility Directory.

110 - Length of longest runway in hundreds of feet; usable length may be less.

UNICOM - Aeronautical advisory station ("U" only on WAC)

RP 23, 34 - Runways with Right Traffic Patterns (public use) (Not shown on WAC)

RP* - (See Airport/Facility Directory)

VFR Advsy 125.0 - VFR Advisory Service shown where ATIS is not available and frequency is other than primary CT frequency.

WX CAM - Weather Camera (AK)

AOE - Airport of Entry

Airports with Control Towers (CT), and their related information, are shown in blue. All other airports, and their related information, are shown in magenta.

The symbol L indicates that runway lights are on during hours of darkness. A *L indicates that the pilot must consult the Airport/Facility Directory (A/FD) to determine runway lighting limitations, such as: available on request (by radio call, letter, phone, etc), part-time lighting or pilot/airport controlled lighting. Lighting codes refer to runway edge lights. The lighted runway may not be the longest runway available, and may not be lighted full length. A detailed description of airport and air navigation lighting aids available at each airport can be found in the A/FD. When information is lacking, the respective character is replaced by a dash. The symbol ☆ indicates the existence of a rotating or flashing airport beacon operating continuously sunset to sunrise. The Aeronautical Information Manual (AIM) thoroughly explains the types and uses of airport lighting aids.

Right traffic information is shown using the abbreviation ‘RP’ for right pattern followed by the appropriate runway number(s) (RP 18). Special conditions or restrictions to the right pattern are indicated by the use of an asterisk (RP*) to direct the pilot to the Airport/Facility Directory for special instruction and/or restrictions.

An airport with an objectionable airspace determination will be shown with type “OBJECTIONABLE.” This airport may adversely affect airspace use. FAA Airports Offices are responsible for airspace determinations and follow FAA Order 7400.2 for writing the determinations. If an airport owner or chart user wishes to challenge the determination, he or she should contact their FAA Regional Airports Office.

CONTROLLED AIRSPACE

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

Class A Airspace within the United States extends from 18,000’ up to 60,000’ MSL. While visual charts do not depict Class A, it is important to note its existence.

Class B Airspace is shown in abbreviated form on the World Aeronautical Chart (WAC). The Sectional Aeronautical Chart (Sectional) and Terminal Area Chart (TAC) show Class B in greater detail. The MSL ceiling and floor altitudes of each sector are shown in solid blue figures with the last

two zeros omitted: 90/20. (Floors extending "upward from above" a certain altitude are preceded by a (+). Operations at and below these altitudes are outside of Class B Airspace).

Radials and arcs used to define Class B are prominently shown on TACs. Detailed rules and requirements associated with the particular Class B are shown. The name by which the Class B is identified is shown as LAS VEGAS CLASS B for example.

Class C Airspace is shown in abbreviated form on WACs. Sectionals and TACs show Class C in greater detail.

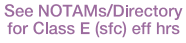
The MSL ceiling and floor altitudes of each sector are shown in solid magenta figures with the last two zeros eliminated: 70/15. The following figures identify a sector that extends from the surface to the base of the Class B: T/SFC. The name by which the Class C is identified is shown as: BURBANK CLASS C. Separate notes, enclosed in magenta boxes, give the approach control frequencies to be used by arriving VFR aircraft to establish two-way radio communication before entering the Class C (generally within 20 NM):

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

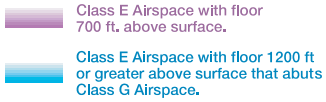
Ceilings of Class D are shown as follows: [30].

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

Class E Surface (SFC) Airspace is symbolized by a magenta dashed line. Class E (sfc) operating less than continuous is indicated by the following note:



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



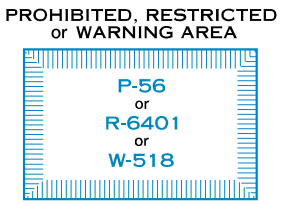
Controlled airspace floors of 700' above the ground are defined by a magenta vignette; floors other than 700' that abut uncontrolled airspace (Class G) are defined by a blue vignette; differing floors greater than 700' above the ground are annotated by a symbol 2400 AGL / 4500 MSL and a number indicating the floor. If the ceiling is less than 18,000' MSL, the value (prefixed by the word "ceiling") is shown along the limits of the controlled airspace. These limits are shown with the same symbol indicated above.

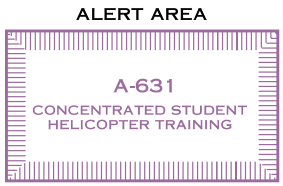
UNCONTROLLED AIRSPACE

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

SPECIAL USE AIRSPACE

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





OTHER AIRSPACE AREAS

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 is designated, is depicted by a solid

magenta line MODE C / 30 NM . Mode C is required but not depicted for operations within and above all Class C up to 10,000' MSL. Enroute Mode C requirements (at and above 10,000' MSL except in airspace at and below 2500' AGL) are not depicted. See FAR 91.215 and the AIM.

FAR 93 Airports and heliports where Federal Aviation Regulation (FAR 93) special air traffic rules and airport traffic patterns apply are shown by "boxing" the airport name.

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

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

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

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

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

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

The outer limit of the entire TRSA is a continuous screened black line. The various sectors within the TRSA are symbolized by slightly narrower screened black lines.

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

Military Training Routes (MTRs) are shown on Sectionals and TACs. They are identified by the route designator: IR21. Route designators are shown in solid black on the route centerline, positioned along the route for continuity. The designator IR or VR is not repeated when two or more routes are established over the same airspace, e.g., IR201-205-227. Routes numbered 001 to 099 are shown as IR1 or VR99, eliminating the initial zeros. Direction of flight along the route is indicated by small arrowheads adjacent to and in conjunction with each route designator.

The following note appears on Sectionals and TACs covering the conterminous United States.

MILITARY TRAINING ROUTES (MTRs)

All IR and VR MTRs are shown, and may extend from the surface upwards. Only the route centerline, direction of flight along the route and the route designator are depicted - route widths and altitudes are not shown.

Since these routes are subject to change every 56 days, and the charts are reissued every 6 months, you are cautioned and advised to contact Flight Service for route dimensions and current status for those routes affecting your flight.

Routes with a change in the alignment of the charted route centerline will be indicated in the Aeronautical Chart Bulletin of the Airport/Facility Directory.

DoD users refer to Area Planning AP/1B Military Training Routes North and South America for current routes.

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

a. Routes at or below 1500' AGL (with no segment above 1500') are identified by four-digit numbers; e.g., VR1007, etc. These routes are generally developed for flight under Visual Flight Rules.

b. Routes above 1500' AGL (some segments of these routes may be below 1500') are identified by three or fewer digit numbers; e.g., IR21, VR302, etc. These routes are developed for flight under Instrument Flight Rules.

MTRs can vary in width from 4 to 16 miles. Detailed route width information is available in the Flight Information Publication (FLIP) AP/1B (a DoD publication), or in the Digital Aeronautical Chart Supplement (DACS) produced by AeroNav Products.

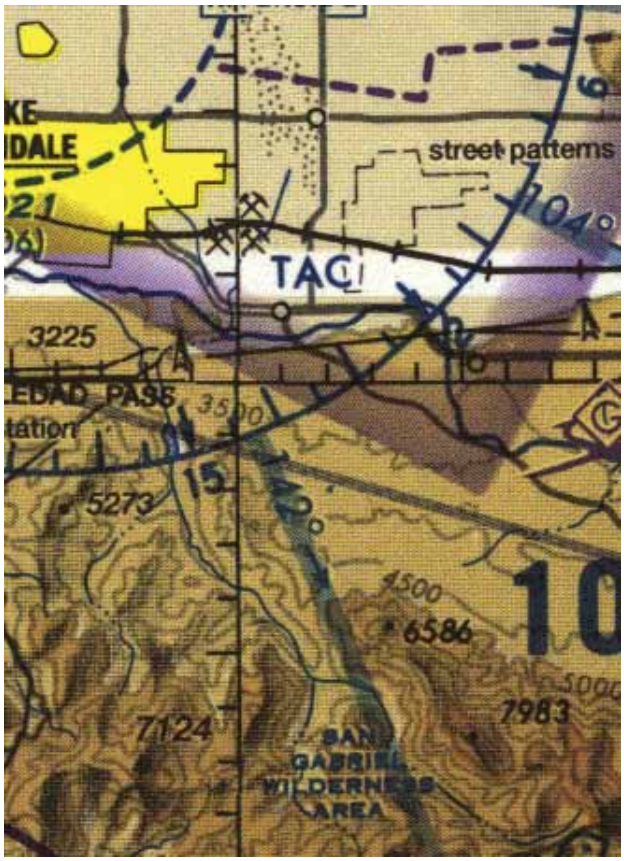
Special Military Activity areas are indicated on the Sectionals by a boxed note in black type. The note contains radio frequency information for obtaining area activity status.

SPECIAL MILITARY ACTIVITY
CTC MOBILE RADIO
ON 123.6
FOR ACTIVITY STATUS

TERMINAL AREA CHART (TAC) COVERAGE

TAC coverage is shown on appropriate Sectionals by a 1/4” masked line as indicated below. Within this area, pilots should use TACs which provide greater detail and clarity of information. A note to this effect appears near the masked boundary line.

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



INSET COVERAGE

Inset coverage is shown on appropriate Sectionals by a 1/8” masked line as indicated below. A note to this effect appears near the masked boundary line.

If inset chart is on the same chart as outline:

INDIANAPOLIS INSET
See inset chart for additional detail

If inset chart is on a different chart:

INDIANAPOLIS INSET
See inset chart on the St. Louis Sectional for additional information

CHART TABULATIONS

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

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

Special Use Airspace (SUA) Prohibited, Restricted and Warning Areas are presented in blue and listed numerically for U.S. and other countries. Restricted, Danger and Advisory Areas outside the U.S. are tabulated separately in blue. A tabulation of Alert Areas (listed numerically) and Military Operations Areas (MOA) (listed alphabetically) appear on the chart in magenta. All are supplemented with altitude, time of use and the controlling agency/contact facility, and its frequency, when available. The controlling agency will be shown when the contact facility and frequency data is unavailable.

Airports with control towers are indicated on the face of the chart by the letters CT followed by the primary VHF local control frequency (ies). Information for each tower is listed in the table below. Operational hours are local time. The primary VHF and UHF local control frequencies are listed. An asterisk (*) indicates the part-time tower frequency is remoted to a collocated full-time FSS for use as Airport Advisory Service (AAS) during hours the tower is closed. The primary VHF and UHF ground control frequencies are listed.

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

ASR and/or PAR indicate Radar Instrument Approach available.

"MON-FRI" indicates Monday through Friday.

Frequencies (VHF/UHF)

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

Airport Name

Radar Instrument Approach available

Hours of Operation (local time)

Approach direction dependent

Frequencies (VHF/UHF)

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

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

Airspace Name

Sectors for VHF and UHF traffic

local time

O/T indicates Other times

SPECIAL USE AIRSPACE ON SECTIONAL CHART

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

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

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

NUMBER	ALTITUDE	TIME OF USE	CONTROLLING AGENCY/ CONTACT FACILITY	FREQUENCIES
R-6602 A	TO BUT NOT INCL 4000	CONTINUOUS MAY 1-SEP 15 †24 HRS IN ADVANCE	WASHINGTON CNTR	118.75 377.1
R-6602 B	4000 TO BUT NOT INCL 11,000	BY NOTAM 24 HRS IN ADVANCE	WASHINGTON CNTR	118.75 377.1
R-6602 C	11,000 TO BUT NOT INCL 18,000	BY NOTAM 24 HRS IN ADVANCE	WASHINGTON CNTR	118.75 377.1
A-220	TO 4000 AGL	0800-2200	NO A/G	

VHF/UHF

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

VHF/UHF

*Altitudes indicate floor of MOA. All MOAs extend to but do not include FL 180 unless otherwise indicated in tabulation or on chart.
†Other times by DoD NOTAM.

Sunrise to Sunset

CANADA R-RESTRICTED, D-DANGER AND A-ADVISORY AREA

NUMBER	LOCATION	ALTITUDE	TIME OF USE	CONTROLLING AGENCY
CYR754	CONFEDERATION BRIDGE, PE	TO 500	CONTINUOUS	
CYD734	HALIFAX, NS	TO FL 200	OCCASIONAL BY NOTAM	MONCTON ACC
CYA702 (P)	GREENWOOD, NS	TO 500	CONT DAYLIGHT	
CYA752 (M)	LIVERPOOL, NS	TO FL 280	CONT DAYLIGHT MON-FRI EXC HOL†	MONCTON ACC

Restricted
Danger
Advisory

A-Acrobatic F-Aircraft Test Area H-Hang Gliding M-Military Operations P-Parachuting S-Soaring T-Training

VFR AERONAUTICAL CHART SYMBOLS

AERONAUTICAL INFORMATION

TOPOGRAPHIC INFORMATION

CULTURE

HYDROGRAPHY

RELIEF

GENERAL INFORMATION

Symbols shown are for World Aeronautical Charts (WACs), Sectional Aeronautical Charts (Sectionals), Terminal Area Charts (TACs), VFR Flyway Planning Charts and Helicopter Route Charts. When a symbol is different on any VFR chart series, it will be annotated, e.g., “WAC” or “Not shown on WAC.”

Photo by: Laurie Zaleski

VFR AERONAUTICAL CHARTS - Aeronautical Information

AIRPORTS

LANDPLANE: CIVIL

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

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

Refueling and repair facilities for normal traffic.

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

WAC

SEAPLANE: CIVIL

WAC

LANDPLANE: CIVIL-MILITARY

WAC

LANDPLANE: MILITARY

Refueling and repair facilities not indicated.

WAC

AIRPORTS

LANDPLANE: EMERGENCY

No facilities

or

Complete information is not available.

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

PUBLIC USE (Soft surfaced runway, or hard surfaced runway less than 1500' in length.) - Limited attendance or no service available

RESTRICTED OR PRIVATE (Soft surfaced runway, or hard surfaced runway less than 1500' in length.) - Use only in emergency, or by specific authorization

UNVERIFIED - A landing area available for public use but warranting more than ordinary precaution due to:
(1) lack of current information on field conditions, and / or
(2) available Information Indicates peculiar operating limitations.

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

WAC

SEAPLANE: EMERGENCY

No facilities or complete information is not available.

WAC

HELIPORT

(Selected)

WAC

ULTRALIGHT FLIGHT PARK

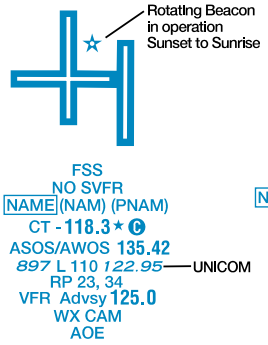
(Selected)

Not shown on WAC

AIRPORT DATA GROUPING

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

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



VFR AERONAUTICAL CHARTS - Aeronautical Information

AIRPORTS

FSS - Flight Service Station on field

NO SVFR - Airports where fixed wing special visual flight rules operations are prohibited (shown above airport name) F.A.R. 91

[ ] - Indicates F.A.R. 93 Special Air Traffic Rules and Airport Traffic Patterns

(NAM) - Location Identifier

(PNAM) - ICAO Location Indicator

CT - 118.3 - Control Tower (CT) - primary frequency

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

Ⓒ - Follows the Common Traffic Advisory Frequency (CTAF) (Not shown on WAC)

ATIS 123.8 - Automatic Terminal Information Service

AFIS 135.2 - Automatic Flight Information Service

ASOS/AWOS 135.42 - Automated Surface Weather Observing Systems; shown when full-time ATIS is not available. (Not shown on WAC) Some ASOS/AWOS facilities may not be located at airport.

897 - Elevation in feet

L - Lighting in operation Sunset to Sunrise

*L - Lighting limitations exist; refer to Airport/Facility Directory.

110 - Length of longest runway in hundreds of feet; usable length may be less.

UNICOM - Aeronautical advisory station ("U" only on WAC)

RP 23, 34 - Runways with Right Traffic Patterns (public use) (Not shown on WAC)

RP★ - (See Airport/Facility Directory)

VFR Advsy 125.0 - VFR Advisory Service shown where ATIS is not available and frequency is other than primary CT frequency.

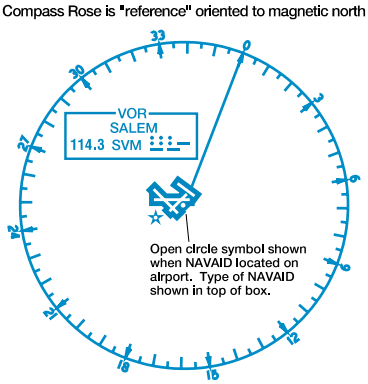
WX CAM - Weather Camera (AK)

AOE - Airport of Entry

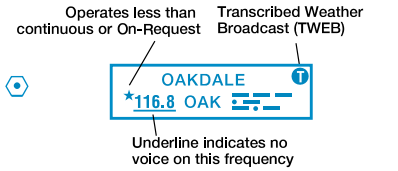
When information is lacking, the respective character is replaced by a dash. Lighting codes refer to runway edge lights and may not represent the longest runway or full length lighting

RADIO AIDS TO NAVIGATION

VHF OMNI-DIRECTIONAL RADIO (VOR) RANGE

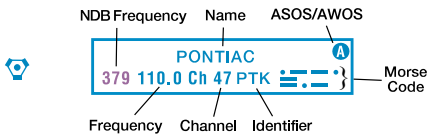


VOR

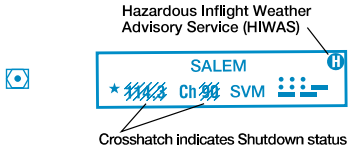


VORTAC

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

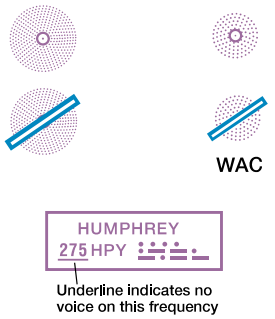


VOR-DME

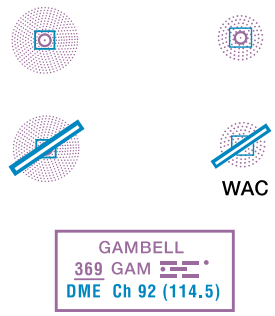


RADIO AIDS TO NAVIGATION

NON-DIRECTIONAL RADIO BEACON (NDB)

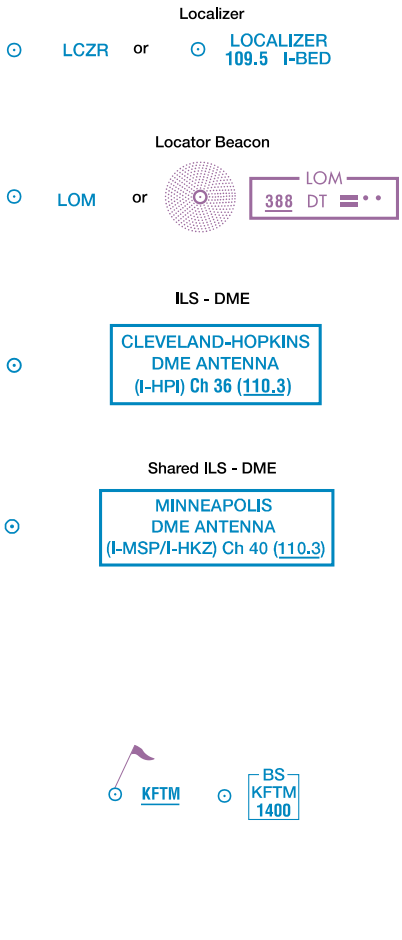


NDB-DME



ILS COMPONENTS

Shown when component of airway system or used in the description of Class B airspace.



BROADCAST STATIONS (BS)

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

VFR AERONAUTICAL CHARTS - Aeronautical Information

RADIO AIDS TO NAVIGATION

FLIGHT SERVICE STATION (FSS)

Heavy line box indicates Flight Service Station (FSS). Frequencies 121.5, 122.2, 243.0 and 255.4 (Canada - 121.5, 126.7 and 243.0) are available at many FSSs and are not shown above boxes.
All other frequencies are shown.
Certain FSSs provide Airport Advisory Service, see A/FD.
R - Receive only

PONTIAC PTK

No NAVAID of the same name as FSS

or

122.1R
IDAHO FALLS
109.0 Ch 27 IDA

FSS oper 0500-2300
Boise FSS other times.

NAVAID same name as FSS but not an RCO

Transoceanic VHF frequencies are long range four digit numbers. These were used during the World War II era. They now have become legacy frequencies that some Alaska FSSs still maintain by doing radio checks with the U.S. Coast Guard.

2866
PONTIAC PTK

REMOTE COMMUNICATIONS OUTLET (RCO)

Frequencies above thin line box are remoted to NAVAID site. Other FSS frequencies providing voice communication may be available as determined by altitude and terrain. Consult Airport/Facility Directory for complete information.

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

123.6
OLYMPIA RCO
McCHORD

122.35
ST PAUL
108.6 STP
MINNEAPOLIS

122.35
HUMPHREY
275 HPY
MILES CITY

FSS radio providing voice communication

AIR FORCE STATION (AFS)

122.0 AFS 123.6
POINT BARROW

122.4 AFS 123.6
CAPE LEWISTON
206 LWS

AFS at airport with NDB

LONG RANGE RADAR STATION (LRRS)

122.4 LRRS 122.55
BARTER ISLAND

122.4 LRRS 123.6
CAPE LISBURNE
385 LUR

LRRS at airport with NDB

OFF AIRPORT AWOS/ASOS

⊙ SANDBERG ASOS 120.625

ALASKA WEATHER CAMERA

Stand-Alone

⊙ ANCHORAGE WX CAM

Collocated with Airport Must be within 2 NM to have same name.

WRANGELL (68A)
OO - 90 122.6 C
WX CAM
AOE

AIRSPACE INFORMATION

CLASS B AIRSPACE

Appropriate notes as required may be shown.

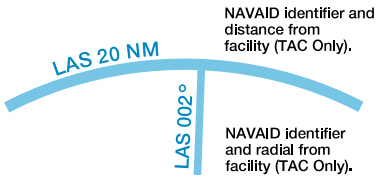
Only the airspace effective below 18,000 feet MSL are shown.

(Mode C see FAR 91.215/AIM)

All mileages are nautical (NM).

All radials are magnetic.

LAS VEGAS CLASS B



WAC

Outer limit only, segments not shown

FOR FLIGHTS AT AND BELOW 8000′ MSL SEE KANSAS CITY VFR TERMINAL AREA CHART

WAC only

80 - Ceiling of Class B in hundreds of feet MSL
40 - Floor of Class B in hundreds of feet MSL

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

CTC LAS VEGAS APP ON 121.1 OR 257.8

TAC only

CLASS C AIRSPACE

Appropriate notes as required may be shown.

(Mode C see FAR 91.215/AIM)

BURBANK CLASS C

See NOTAMs/Directory for Class C eff hrs

BOISE CLASS C

See NOTAMs/Directory for Class C eff hrs

WAC

Outer limit only, segments not shown

FOR FLIGHTS AT OR BELOW 6600 MSL SEE PHOENIX VFR SECTIONAL CHART

WAC only

VFR AERONAUTICAL CHARTS - Aeronautical Information

AIRSPACE INFORMATION

CLASS C AIRSPACE (CONTINUED)

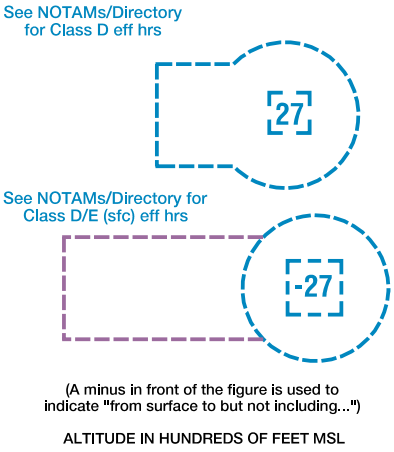
48 - Ceiling of Class C in hundreds of feet MSL
30 - Floor of Class C in hundreds of feet MSL

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

CTC BURBANK APP WITHIN 20 NM ON 124.6 395.9

Not shown on WAC

CLASS D AIRSPACE



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

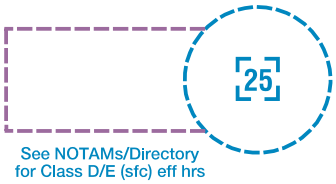
ALTITUDE IN HUNDREDS OF FEET MSL

Not shown on WAC

CLASS E AIRSPACE

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

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



Airspace beginning at 700 feet AGL ...

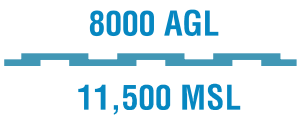
Airspace beginning at 1200 feet AGL or greater that abuts uncontrolled airspace (Class G) ...

AIRSPACE INFORMATION

CLASS E AIRSPACE (CONTINUED)

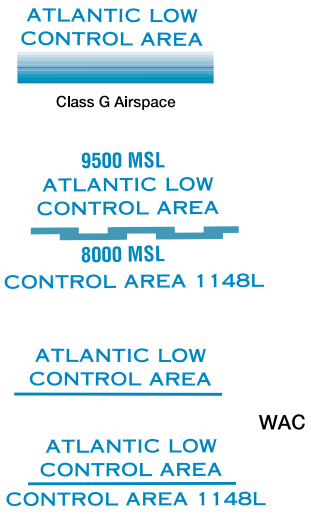
Differentiates floors of airspace greater than 700 feet above the surface...

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



Not shown on WAC

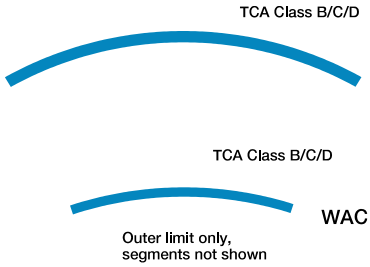
OFFSHORE CONTROL AREAS



CANADIAN AIRSPACE

Individual units of designated Canadian airspace are not necessarily shown; instead, the aggregate lateral and vertical limits shall be portrayed as closely as possible to the comparable U.S. airspace.

Appropriate notes as required may be shown.

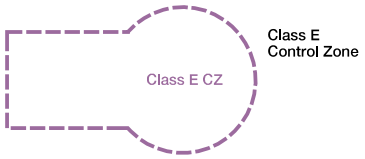


125 - Ceiling of TCA Class B/C/D in hundreds of feet MSL
25 - Floor of TCA Class B/C/D in hundreds of feet MSL

AIRSPACE INFORMATION

CANADIAN AIRSPACE (CONTINUED)

ALTITUDE IN HUNDREDS OF FEET MSL



Not shown on WAC

AIRSPACE CLASSIFICATION (SEE CANADA FLIGHT SUPPLEMENT) AND OPERATIONAL REQUIREMENTS (DOD USERS, SEE DOD AREA PLANNING AP/1) MAY DIFFER BETWEEN CANADA AND UNITED STATES

NOTE: REFER TO CURRENT CANADIAN CHARTS AND FLIGHT INFORMATION PUBLICATIONS FOR INFORMATION WITHIN CANADIAN AIRSPACE

AIRSPACE OUTSIDE OF U.S.

Other than Canada

Appropriate notes as required may be shown.

NOTE: DOD USERS, REFER TO CURRENT DOD (NGA) FLIGHT INFORMATION PUBLICATIONS FOR INFORMATION OUTSIDE OF U.S. AIRSPACE

FLIGHT INFORMATION REGIONS (FIR)

OCEANIC CONTROL AREAS (OCA)

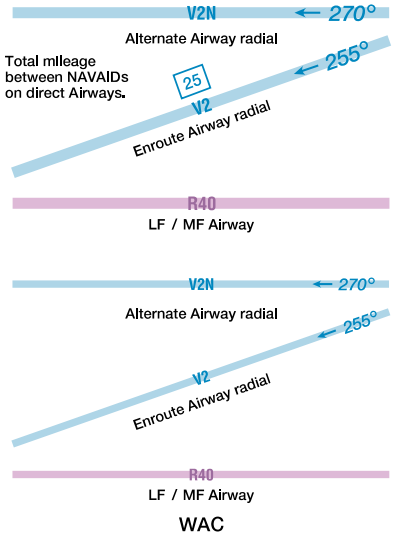
CONTROL AREAS (CTA)

AIRSPACE INFORMATION

LOW ALTITUDE AIRWAYS VOR AND LF / MF (CLASS E AIRSPACE)

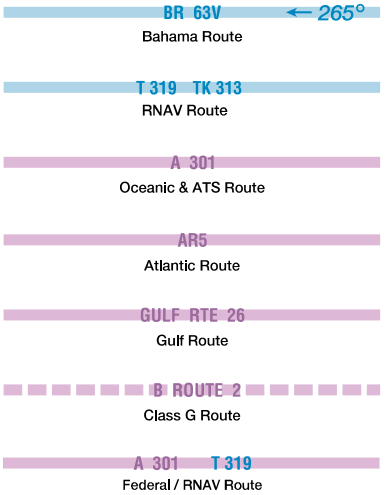
Low altitude Federal Airways are indicated by centerline.

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



MISCELLANEOUS AIR ROUTES

Combined Federal Airway/RNAV "T" Routes are identified in solid blue type adjacent to the solid magenta federal airway identification. The joint route symbol is screened magenta.



AIRSPACE INFORMATION

SPECIAL USE AIRSPACE

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

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

PROHIBITED, RESTRICTED or WARNING AREA

ALERT AREA

MILITARY OPERATIONS AREA (MOA)

MILITARY TRAINING ROUTES (MTR)

Not shown on WAC

SPECIAL MILITARY ACTIVITY ROUTES (SMAR)

Boxed notes shown adjacent to route.

SPECIAL MILITARY ACTIVITY
CTC MOBILE RADIO
ON 123.6
FOR ACTIVITY STATUS

40 — — — Ceiling of SMAR in hundreds of feet MSL
05 AGL — — Floor of SMAR in hundreds of feet AGL

Not shown on WAC

AIRSPACE INFORMATION

SPECIAL AIR TRAFFIC RULES / AIRPORT PATTERNS (FAR 93)

Appropriate boxed note as required shown adjacent to area.

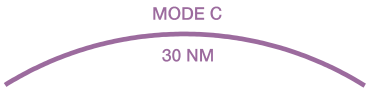
SPECIAL NOTICE
Pilots are required to obtain an ATC clearance prior to entering this area.

SPACE OPERATIONS AREA (FAR 91.143)

Not shown on WAC

MODE C (FAR 91.215)

Appropriate notes as required may be shown.



MISCELLANEOUS AIRSPACE AREAS

Parachute Jumping Area with Frequency 122.9

Glider Operating Area

Ultralight Activity

Hang Glider Activity

Unmanned Aircraft Activity

Not shown on WAC

SPECIAL CONSERVATION AREAS

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

Not shown on WAC

AIRSPACE INFORMATION

SPECIAL AIRSPACE AREAS

SPECIAL FLIGHT RULES AREA (SFRA) RELATING TO NATIONAL SECURITY

Example: Washington DC

Appropriate notes as required may be shown.

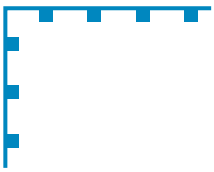
Note. Delimiting line not shown when it coincides with International Boundary, projection lines or other linear features.

Washington DC Metropolitan Area Special Flight Rules Area/Flight Restricted Zone restrictions are in effect.
Special regulations apply to all aircraft operations from the surface to but not including Flight Level 180 in the Washington DC Metropolitan Area. Pilots should contact a local FSS for NOTAM information prior to flight in the Washington DC Metropolitan Area.

FLIGHT RESTRICTED ZONE (FRZ) RELATING TO NATIONAL SECURITY

Example: Washington DC

SPECIAL FLIGHT RULES AREA (SFAR)



CAUTION
Pilots should not attempt flight in the Grand Canyon Special Flight Rules area (GCN SFRA) below 18,000 feet using this chart as their primary navigational reference. Pilots intending to fly within the Grand Canyon SFRA should refer to the Grand Canyon VFR Aeronautical Chart for detailed information. Chart is available from the Federal Aviation Administration (phone 1-800-638-8972) or authorized agents.

TEMPORARY FLIGHT RESTRICTION (TFR) RELATING TO NATIONAL SECURITY

Example: P-40/R-4009

Appropriate notes as required may be shown.

CAUTION
P-40 AND R-4009 EXPANDED BY TEMPORARY FLIGHT RESTRICTION. CONTACT AFSS FOR LATEST STATUS AND NOTAMS

Not shown on WAC

AIRSPACE INFORMATION

AIR DEFENSE IDENTIFICATION ZONE (ADIZ)

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

CONTIGUOUS U.S. ADIZ

NATIONAL SECURITY AREA

Appropriate notes as required may be shown.

NOTICE
FOR REASONS OF NATIONAL SECURITY PILOTS ARE REQUESTED TO AVOID FLIGHT BELOW 1200 MSL IN THIS AREA

Not shown on WAC

HIGH ENERGY RADIATION AREAS

Appropriate notes as required may be shown.

HAZARDOUS LASER TRANSMISSIONS SFC to infinity
See Airport Facility/Directory

WAC

TERMINAL RADAR SERVICE AREA (TRSA)

Appropriate notes as required may be shown.

PALM SPRINGS TRSA

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

SEE TWR FREQ TAB

Not shown on WAC

VFR AERONAUTICAL CHARTS - Aeronautical Information

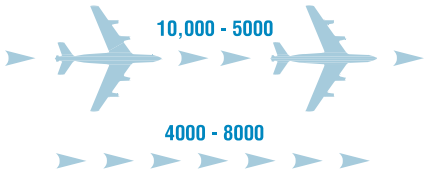
AIRSPACE INFORMATION

IFR ROUTES

Appropriate notes as required may be shown.

Arrival

Departure



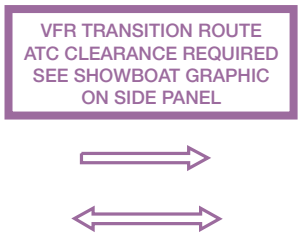
TAC only

VFR TRANSITION ROUTES

Appropriate notes as required may be shown.

Uni-directional

Bi-directional

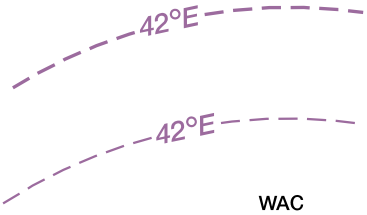


TAC only

NAVIGATIONAL AND PROCEDURAL INFORMATION

ISOGONIC LINE & VALUE

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



WAC

LOCAL MAGNETIC NOTES

Unreliability Notes

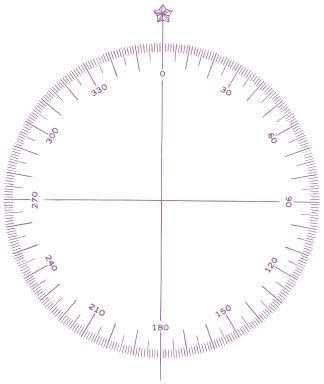
Magnetic disturbance of as much as 78° exists at ground level and 10° or more at 3000 feet above ground level in this vicinity.

NAVIGATIONAL AND PROCEDURAL INFORMATION

COMPASS ROSETTE

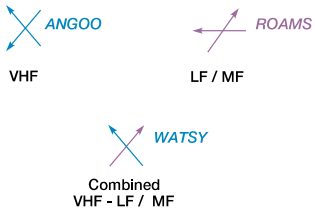
Shown only in areas void of VOR roses.

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



INTERSECTIONS

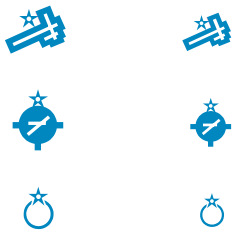
Named intersections used as reporting points. Arrows are directed toward facilities which establish intersection.



Not shown on WAC

AIRPORT BEACONS

Rotating or Flashing



WAC

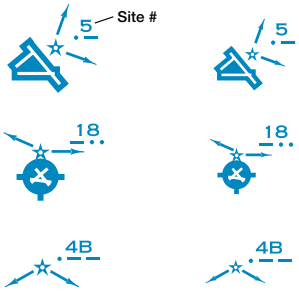
NAVIGATIONAL AND PROCEDURAL INFORMATION

AERONAUTICAL LIGHTS

By Request

Rotating Light with Flashing Code Identification Light

Rotating Light with Course Lights and Site Number



Flashing Light

WAC

MARINE LIGHTS

With Characteristics of Light

Land Light — Land Light

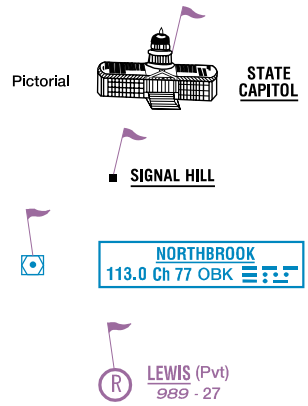
WAC

R	Red
*W	White
G	Green
B	Blue
SEC	Sector
F	Fixed
Oc	Single Occulting
Oc (2)	Group Occulting
Oc (2+1)	Composite Group Occulting
Iso	Isophase
Fl	Flashing
Fl (2)	Group Flashing
Fl (2+1)	Composite Group Flashing
Q	Quick
IQ	Interrupted Quick
Mo (A)	Morse Code
FFl	Fixed and Flashing
*Al	Alternating
Gp	Group
LFl	Long Flash
Q (3)	Group Quick Flashing
IQ	Interrupted Quick Flashing
VQ	Very Quick Flashing
VQ (3)	Group Very Quick Flashing
IVQ	Interrupted Very Quick Flashing
UQ	Ultra Quick Flashing
IUQ	Interrupted Ultra Quick Flashing

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

NAVIGATIONAL AND PROCEDURAL INFORMATION

VFR CHECKPOINTS



Not shown on WAC

VFR WAYPOINTS

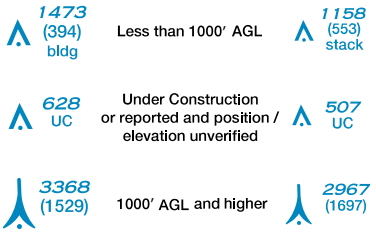
RNAV

Stand-Alone

Collocated with Visual Checkpoint

Not shown on WAC

OBSTRUCTION



WAC

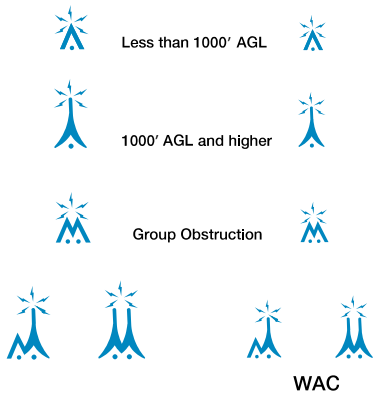
GROUP OBSTRUCTION

WAC

NAVIGATIONAL AND PROCEDURAL INFORMATION

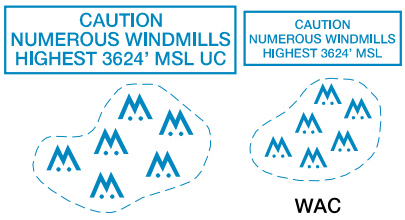
HIGH-INTENSITY OBSTRUCTION LIGHTS

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



WINDMILL FARMS

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



MAXIMUM ELEVATION FIGURE (MEF)

(see page 7 for explanation).

WARNING AND CAUTION NOTES

Used when specific area is not demarcated.

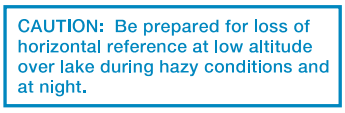
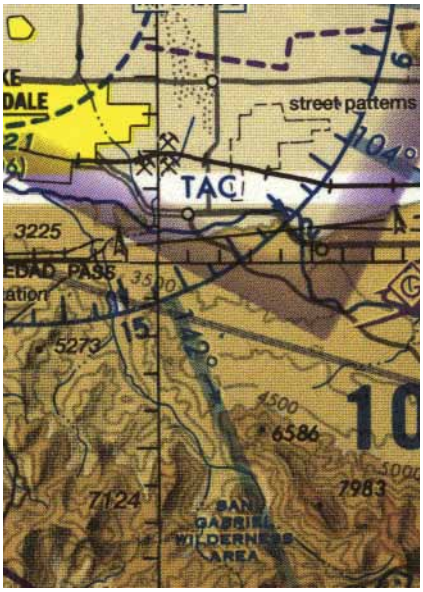


CHART LIMITS

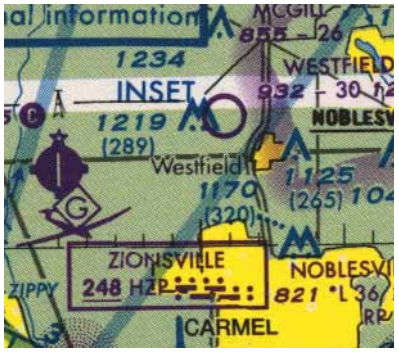
OUTLINE ON SECTIONAL OF TERMINAL AREA CHART



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

Not shown on WAC

OUTLINE ON SECTIONAL OF INSET CHART



If inset chart is on a different chart:

INDIANAPOLIS INSET
See inset chart on the St. Louis Sectional for additional information

If inset chart is on the same chart as outline:

INDIANAPOLIS INSET
See inset chart for additional detail

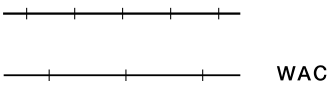
Not shown on WAC

VFR AERONAUTICAL CHARTS - Topographic Information

CULTURE

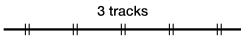
RAILROADS

Single Track

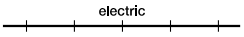


Double Track

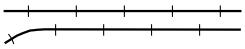
More Than Two Tracks



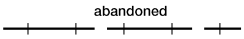
Electric



RAILROADS IN JUXTAPOSITION

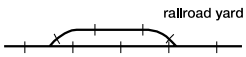


RAILROAD - NON-OPERATING, ABANDONED, DESTROYED OR UNDER CONSTRUCTION

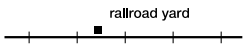


RAILROAD YARDS

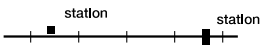
Limiting Track To Scale



Location Only

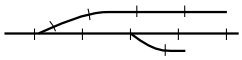


RAILROAD STATIONS



CULTURE

RAILROAD SIDINGS AND SHORT SPURS



ROADS

Dual-Lane Divided Highway Category 1

Primary Category 2

Secondary Category 2

TRAILS

Category 3

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

ROAD MARKERS

Interstate Route No.

U.S. Route No.

Air Marked Identification Label

ROAD NAMES

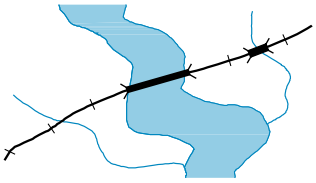
ROADS UNDER CONSTRUCTION

VFR AERONAUTICAL CHARTS - Topographic Information

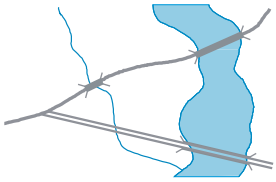
CULTURE

BRIDGES AND VIADUCTS

Railroad

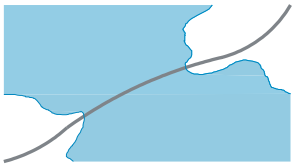


Road

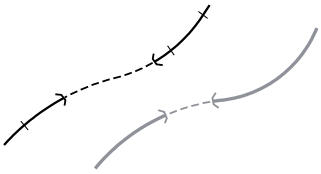


OVERPASSES AND UNDERPASSES

CAUSEWAYS

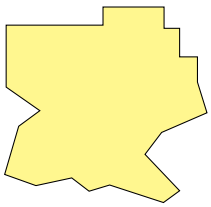


TUNNELS-ROAD AND RAILROAD



POPULATED PLACES

Large Cities Category 1

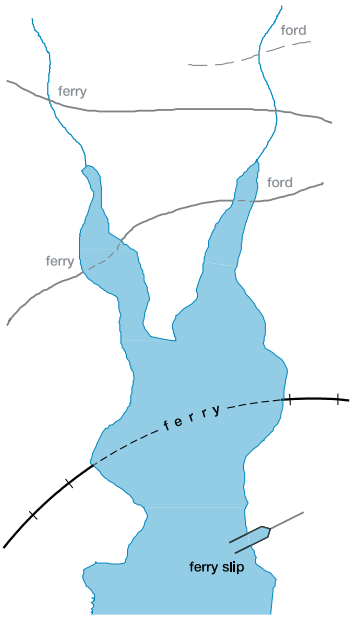


Cities and Large Towns Category 2

Towns and Villages Category 3

CULTURE

FERRIES, FERRY SLIPS AND FORDS



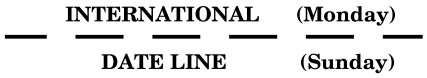
BOUNDARIES

International

State or Province

Convention or Mandate Line

Date Line

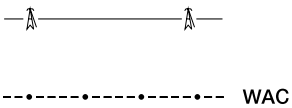


TIME ZONES

MINES OR QUARRIES

Shaft Mines or Quarries

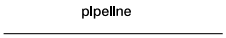
POWER TRANSMISSION & TELECOMMUNICATION LINES



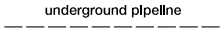
VFR AERONAUTICAL CHARTS - Topographic Information

CULTURE

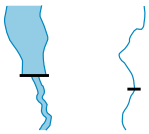
PIPELINES



Underground

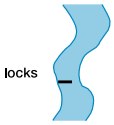


DAMS

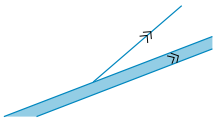


DAM CARRYING ROAD

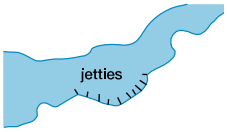
PASSABLE LOCKS



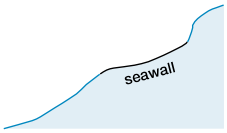
SMALL LOCKS



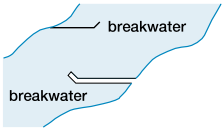
WEIRS AND JETTIES



SEAWALLS

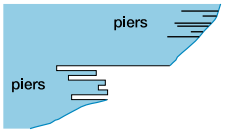


BREAKWATERS



CULTURE

PIERS, WHARFS, QUAYS, ETC.



MISCELLANEOUS CULTURAL FEATURES

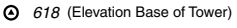
OUTDOOR THEATER

WELLS

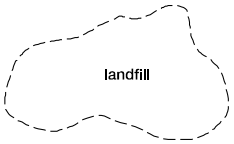
Other Than Water

RACE TRACKS

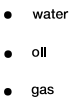
LOOKOUT TOWERS



LANDMARK AREAS



TANKS



COAST GUARD STATION

AERIAL CABLEWAYS, CONVEYORS, ETC.

WAC

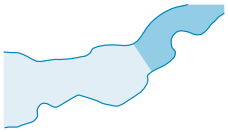
VFR AERONAUTICAL CHARTS - Topographic Information

HYDROGRAPHY

OPEN WATER

INLAND WATER

OPEN / INLAND WATER



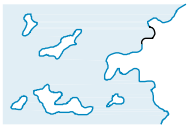
SHORELINES

Definite

Fluctuating

Unsurveyed
Indefinite

Man-made

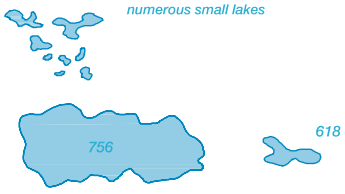


LAKES

Label as required

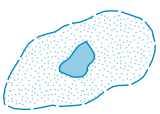
Perennial

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



Non-Perennial

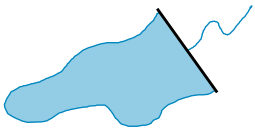
(dry, intermittent, etc.)
Illustration includes small perennial lake



HYDROGRAPHY

RESERVOIRS

Natural Shorelines

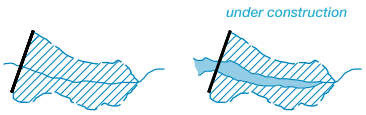


Man-made Shorelines

Label when necessary for clarity

Too small to show to scale

Under Construction



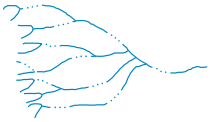
STREAMS

Perennial

Non-Perennial

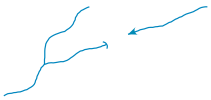
Fanned Out

Alluvial fan



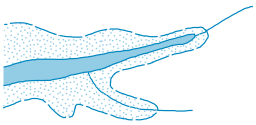
Braided

Disappearing

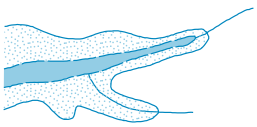


Seasonally Fluctuating

with undefined limits



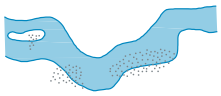
with maximum bank limits, prominent and constant



VFR AERONAUTICAL CHARTS - Topographic Information

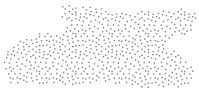
HYDROGRAPHY

Sand Deposits In and Along Riverbeds



WET SAND AREAS

Within and adjacent to desert areas

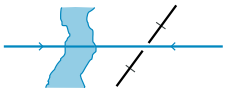


AQUEDUCTS

Abandoned or Under Construction

Underground

Suspended or Elevated



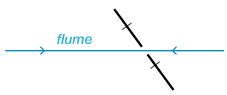
Tunnels

Kanats

Underground aqueduct with air vents

FLUMES, PENSTOCKS AND SIMILAR FEATURES

Elevated

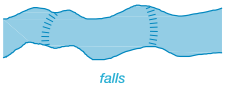


Underground

HYDROGRAPHY

FALLS

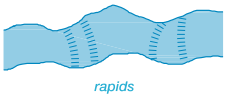
Double-Line



Single-Line

RAPIDS

Double-Line



Single-Line

CANALS

To Scale

Abandoned or Under Construction

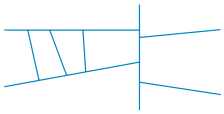
Abandoned to Scale

VFR AERONAUTICAL CHARTS - Topographic Information

HYDROGRAPHY

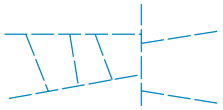
SMALL CANALS AND DRAINAGE / IRRIGATION DITCHES

Perennial



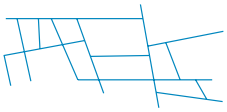
Non-Perennial

Abandoned or Ancient



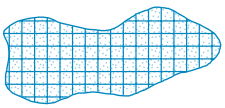
Numerous

Representative pattern and/or descriptive note.



Numerous

SALT EVAPORATORS AND SALT PANS MAN EXPLOITED



SWAMPS, MARSHES AND BOGS

HUMMOCKS AND RIDGES

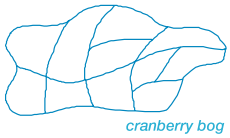
MANGROVE AND NIPA

HYDROGRAPHY

PEAT BOGS

TUNDRA

CRANBERRY BOGS



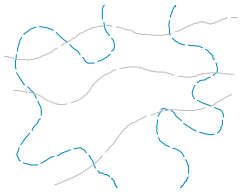
RICE PADDIES

Extensive areas indicated by label only.

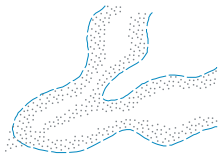
LAND SUBJECT TO INUNDATION

SPRINGS, WELLS AND WATERHOLES

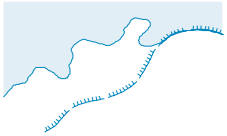
GLACIERS



GLACIAL MORAINES

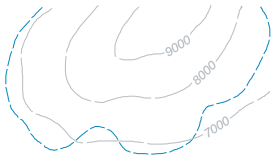


ICE CLIFFS



HYDROGRAPHY

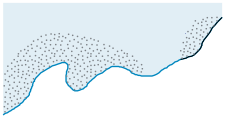
SNOWFIELDS, ICE FIELDS AND ICE CAPS



ICE PEAKS

FORESHORE FLATS

Tidal flats exposed at low tide.



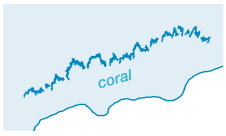
ROCKS-ISOLATED

Bare or Awash

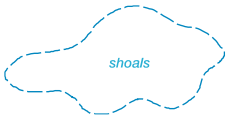
WRECKS

Exposed

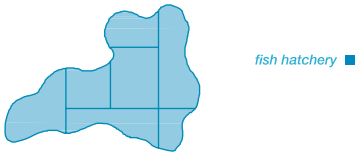
REEFS-ROCKY OR CORAL



MISCELLANEOUS UNDERWATER FEATURES NOT OTHERWISE SYMBOLIZED



FISH PONDS AND HATCHERIES



HYDROGRAPHY

ICE

Permanent Polar Ice

Pack Ice

VFR AERONAUTICAL CHARTS - Topographic Information

RELIEF

CONTOURS

Basic

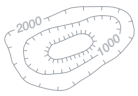
Approximate

Intermediate

Auxiliary

Depression

Illustration includes mound within depression



Values

SPOT ELEVATIONS

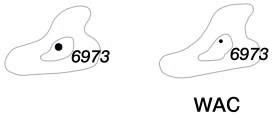
Position Accurate

Position Accurate, Elevation Approximate

RELIEF

Approximate location

Highest in General Area



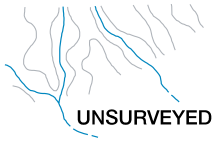
Highest on Chart

MOUNTAIN PASS

HACHURING

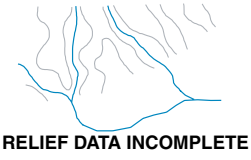
UNSURVEYED AREAS

Label appropriately as required



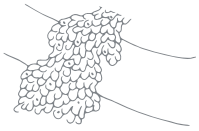
UNCONTOURED AREAS

Label appropriately as required



DISTORTED SURFACE AREAS

LAVA FLOWS

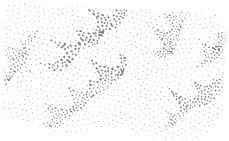


SAND OR GRAVEL AREAS

RELIEF

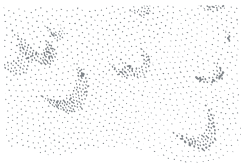
SAND RIDGES

To Scale



SAND DUNES

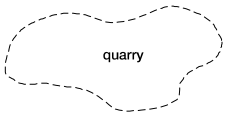
To Scale



SHADED RELIEF

ROCK STRATA OUTCROP

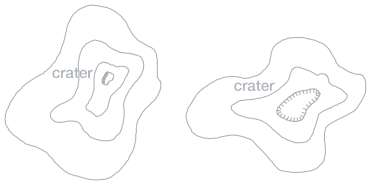
QUARRIES TO SCALE



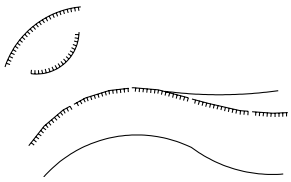
STRIP MINES, MINE DUMPS AND TAILINGS

To Scale

CRATERS

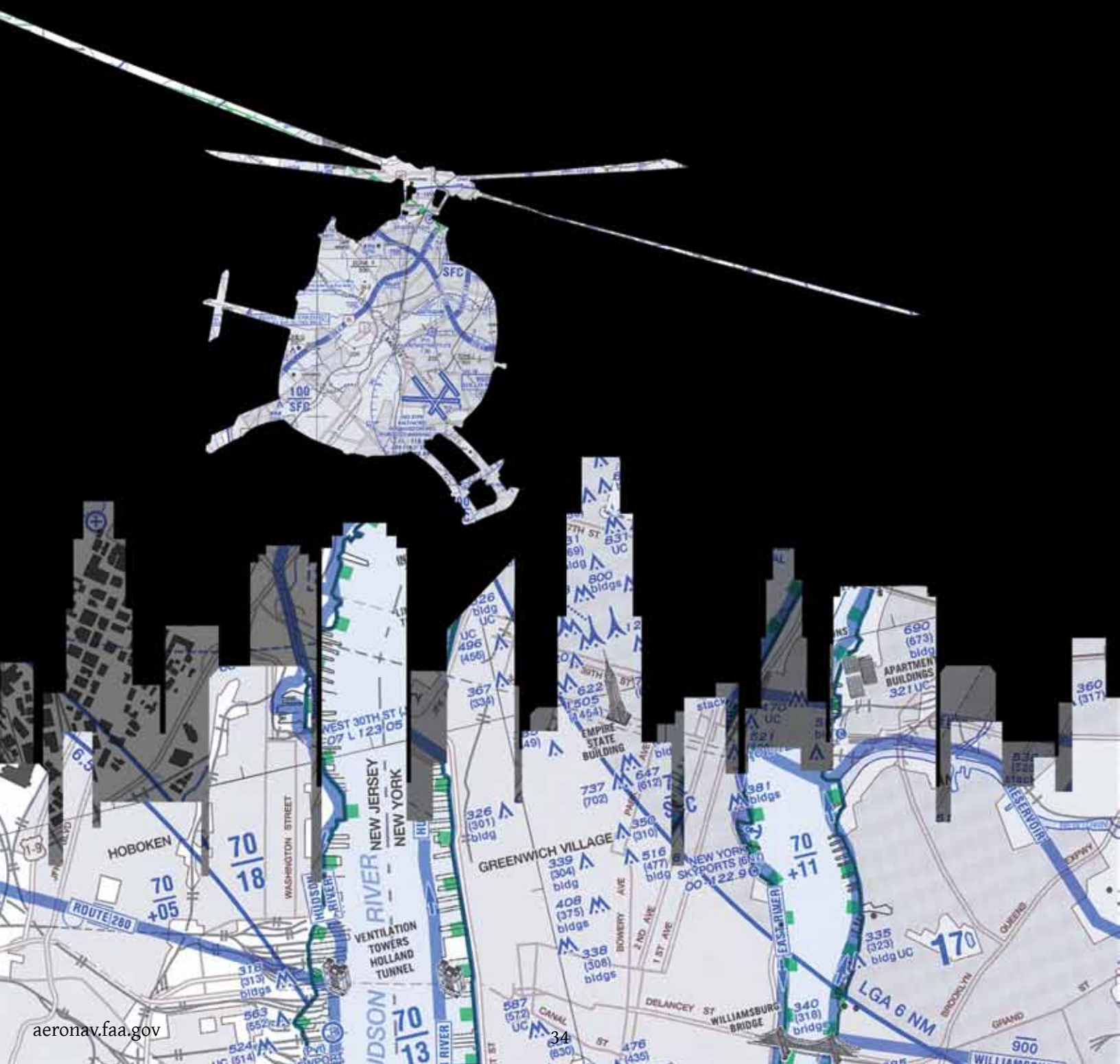


ESCARPMENTS, BLUFFS, CLIFFS, DEPRESSIONS, ETC.



LEVEES AND ESKERS

HELICOPTER ROUTE CHARTS



HELICOPTER ROUTE CHARTS - Aeronautical Information

AIRPORTS

LANDPLANE

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

Public

Private

HELIPORT

Heliports public and private

Hospital Helipads

Trauma Center

Helipads located at major airports

SEAPLANE

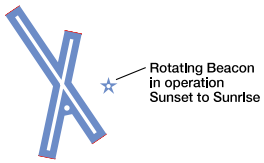
ULTRALIGHT FLIGHT PARK

AIRPORT DATA GROUPING

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

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

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



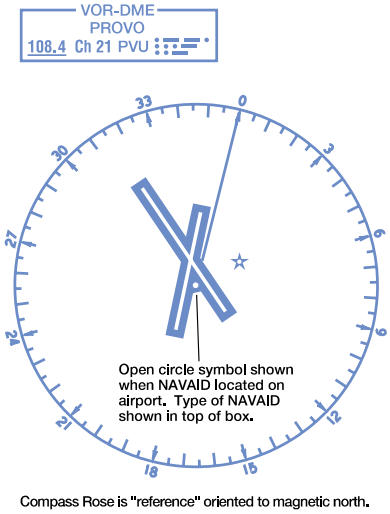
FSS
NO SVFR
NAME (NAM) (PNAM)
CT 119.1 ★ C 119.8 (HELI)
ATIS 115.4
ASOS/AWOS 135.42
03 L 122.95
AOE

FSS - Flight Service Station on field
NO SVFR - Airspace where fixed wing special visual flight rules operations are prohibited (shown above airport name) F.A.R. 91.
[ ] - Indicates F.A.R. 93 Special Air Traffic Rules and Airport Traffic
(NAM) - Location Identifier
(PNAM) - ICAO Location Identifier
CT - 119.1 - Control Tower (CT) - primary frequency
★ - Star indicates operation part-time. See tower frequencies tabulation for hours of operation.
ATIS 115.4 - Automatic Terminal Information Service
ASOS/AWOS 135.42 - Automated Surface Weather Observing Systems (shown when full-time ATIS is not available.) Some ASOS/AWOS facilities may not be located at airports.
03 - Elevation in feet
L - Lighting in operation Sunset to Sunrise
*L - Lighting limitations exist, refer to Airport/Facility Directory.
122.95 - UNICOM - Aeronautical advisory station
C - Follows the Common Traffic Advisory Frequency (CTAF)
(Unverified) - Unverified Heliport
AOE - Airport of Entry

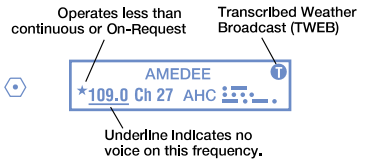
When lighting is lacking, the respective character is replaced by a dash. Lighting codes refer to runway edge lights and may not represent be the longest runway or full length lighting. Dashes are not shown on heliports or helipads unless additional information follows the elevation (e.g. UNICOM, CTAF).

RADIO AIDS TO NAVIGATION

VHF OMNI-DIRECTIONAL RADIO (VOR) RANGE

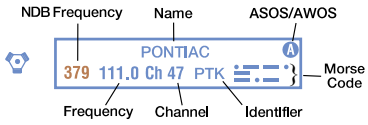


VOR

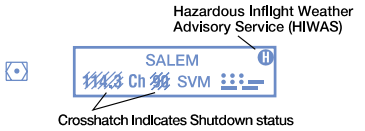


VORTAC

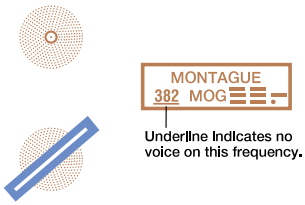
When an NDB NAVAID shares the same name and Morse Code as the VOR NAVAID the frequency can be collocated inside the same box to conserve space.



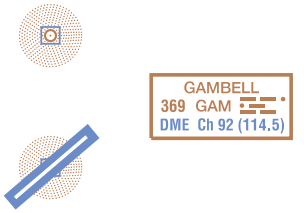
VOR-DME



NON-DIRECTIONAL RADIO BEACON (NDB)



NDB-DME



HELICOPTER ROUTE CHARTS - Aeronautical Information

RADIO AIDS TO NAVIGATION

NAVAIDS USED TO DEFINE CLASS B AIRSPACE

ILS - DME

CLEVELAND-HOPKINS
DME ANTENNA
(I-HPI) Ch 36 (110.3)

Shared ILS - DME

MINNEAPOLIS
DME ANTENNA
(I-MSP/I-HKZ) Ch 40 (110.3)

BROADCAST STATIONS (BS)

On request by the proper authority or when a VFR Check-point.

FLIGHT SERVICE STATION (FSS)

Heavy line box indicates Flight Service Station (FSS).
Frequencies 121.5, 122.2, 243.0 and 255.4 (Canada - 121.5, 126.7 and 243.0) are available at many FSSs and are not shown above boxes.
All other frequencies are shown.
Certain FSSs provide Airport Advisory Service, see A/FD.
R - Receive only

DENVER DEN

No NAVAID of the same name as FSS

or

122.1R 123.6
NORTHWAY
116.3 Ch 110 ORT

FSS oper 0600-2200
Rancho Murieta FSS other times.

NAVAID same name as FSS but not an RCO

REMOTE COMMUNICATIONS OUTLET (RCO)

Frequencies above thin line box are remoted to NAVAID site. Other FSS frequencies providing voice communication may be available as determined by altitude and terrain. Consult Airport/Facility Directory for complete information.

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

123.6
OLYMPIA RCO
McCHORD

122.35
ST PAUL
108.6 STP
MINNEAPOLIS

122.35
GAMBELL
369 GAM
MILES CITY

FSS radio providing voice communication

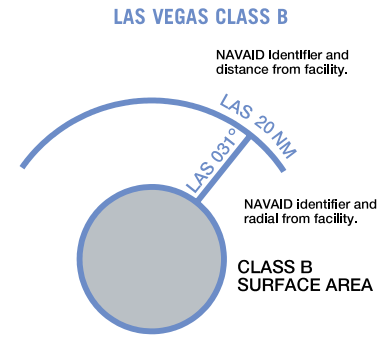
AIRSPACE INFORMATION

CLASS B AIRSPACE

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

All mileages are nautical (NM)

All radials are magnetic.



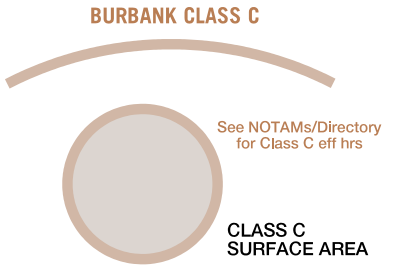
70 - Ceiling of Class B in hundreds of feet MSL
SFC - Floor of Class B in hundreds of feet MSL

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

CTC LAS VEGAS APP
ON 121.1 OR 257.8

CLASS C AIRSPACE

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

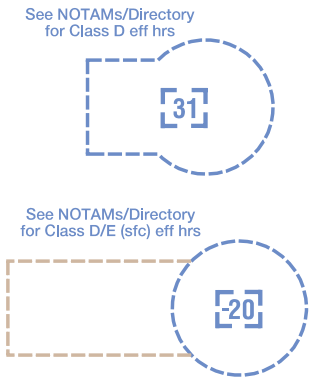


70 - Ceiling of Class C in hundreds of feet MSL
30 - Floor of Class C In hundreds of feet MSL

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

CTC BURBANK APP WITHIN
20 NM ON 124.6 395.9

CLASS D AIRSPACE



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

ALTITUDES IN HUNDREDS OF FEET MSL

HELICOPTER ROUTE CHARTS - Aeronautical Information

AIRSPACE INFORMATION

CLASS E SURFACE (SFC) AIRSPACE

SPECIAL AIRSPACE AREAS

SPECIAL FLIGHT RULES AREA (SFRA) RELATING TO NATIONAL SECURITY

Example: Washington DC

Appropriate notes as required may be shown.

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

Washington DC Metropolitan Area Special Flight Rules Area/Flight Restricted Zone restrictions are in effect.
Special regulations apply to all aircraft operations from the surface to but not including Flight Level 180 in the Washington DC Metropolitan Area. Pilots should contact a local FSS for NOTAM information prior to flight in the Washington DC Metropolitan Area.

FLIGHT RESTRICTED ZONE (FRZ) RELATING TO NATIONAL SECURITY

Example: Washington DC

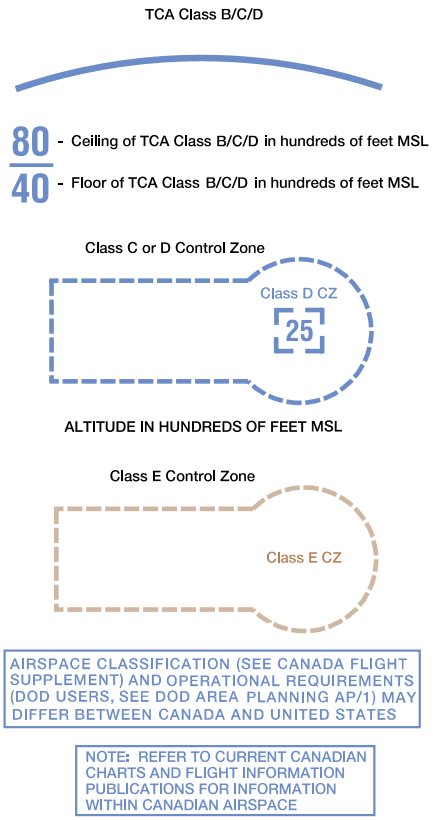
AIR DEFENSE IDENTIFICATION ZONE (ADIZ)

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

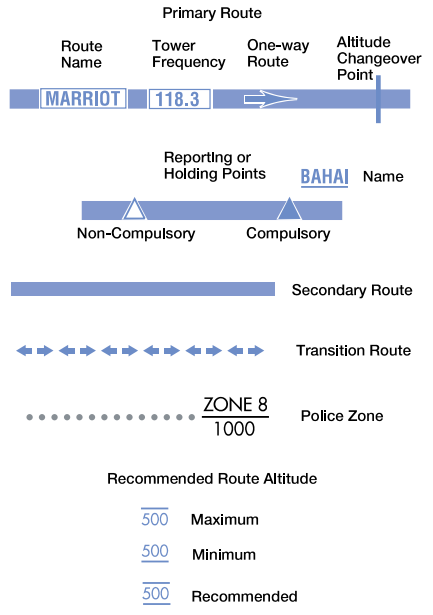
AIRSPACE INFORMATION

CANADIAN AIRSPACE

Appropriate notes as required may be shown.



HELICOPTER ROUTES



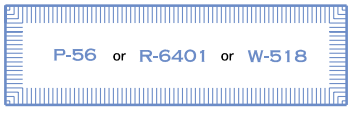
HELICOPTER ROUTE CHARTS - Aeronautical Information

AIRSPACE INFORMATION

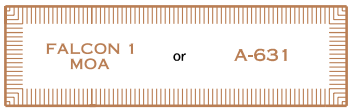
SPECIAL USE AIRSPACE

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

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



PROHIBITED, RESTRICTED or WARNING AREA

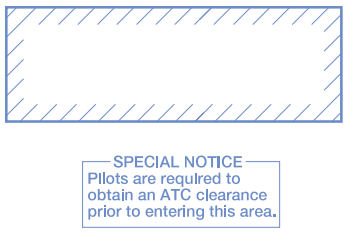


MILITARY OPERATIONS AREA (MOA) or ALERT AREA

MILITARY TRAINING ROUTES (MTR)

SPECIAL AIR TRAFFIC RULES / AIRPORT TRAFFIC AREAS (FAR PART 93)

Appropriate boxed notes as required shown adjacent to area.



MODE C (FAR 91.215)

Appropriate notes as required may be shown.

MISCELLANEOUS AIRSPACE AREAS

Parachute Jumping Area with Frequency

Glider Operating Area

Ultralight Activity

Hang Glider Activity

Unmanned Aircraft Activity

SPECIAL CONSERVATION AREAS

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

AIRSPACE INFORMATION

TERMINAL RADAR SERVICE AREA (TRSA)

Appropriate notes as required may be shown.

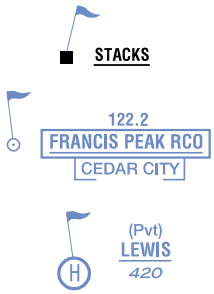
80 - Ceiling of TRSA in hundreds of feet MSL

40 - Floor of TRSA in hundreds of feet MSL

NAVIGATIONAL AND PROCEDURAL INFORMATION

VFR CHECKPOINTS

Pictorial



VFR WAYPOINTS

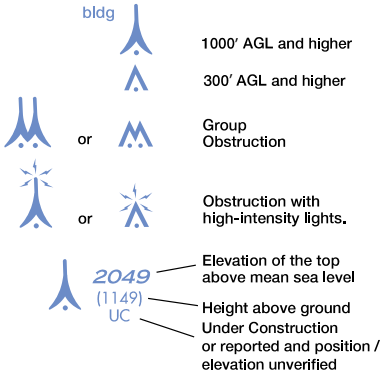
Stand-Alone

Collocated with Visual Checkpoint

Collocated with Visual Checkpoint & Reporting Point

OBSTRUCTIONS

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

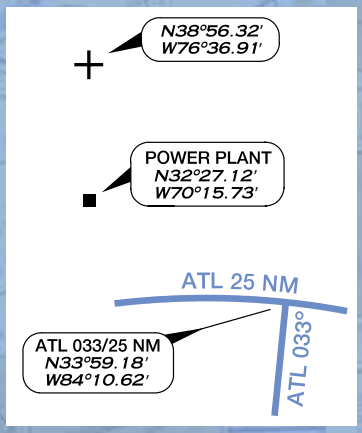


MAXIMUM ELEVATION FIGURE (MEF)

(see page 7 for explanation).

NAVIGATIONAL AND PROCEDURAL INFORMATION

NAVIGATION DATA



WARNING AND CAUTION NOTES

WARNING
Extensive fleet and air operations being conducted in offshore areas to approximately 100 miles seaward.

CAUTION: Be prepared for loss of horizontal reference at low altitude over lake during hazy conditions and at night.

LOCAL MAGNETIC NOTES

Unreliability Notes

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

HELICOPTER ROUTE CHARTS - Topographic Information

CULTURE

RAILROADS

Single Track

Double Track

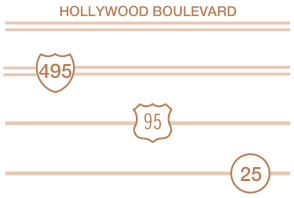
ROADS

Dual-Lane:

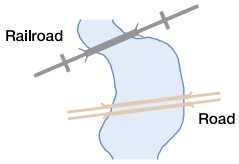
Divided Highways

Major Boulevards & Major Streets

Primary

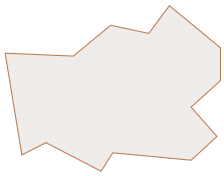


BRIDGES



POPULATED PLACES

Built-up Areas



BOUNDARIES

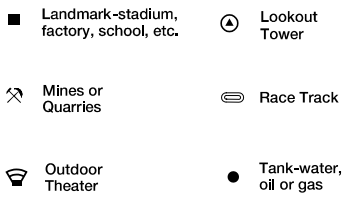
International

State or Province

POWER TRANSMISSION LINES

PROMINENT PICTORIALS

LANDMARKS

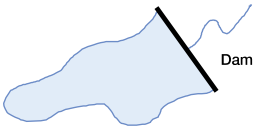


HYDROGRAPHY

SHORELINES

MAJOR LAKES AND RIVERS

RESERVOIRS



RELIEF

SPOT ELEVATIONS

Position Accurate • *405*

VFR FLYWAY PLANNING CHARTS

Photo by: Laurie Zaleski

VFR FLYWAY PLANNING CHARTS - Aeronautical Information

AIRPORTS

LANDPLANE

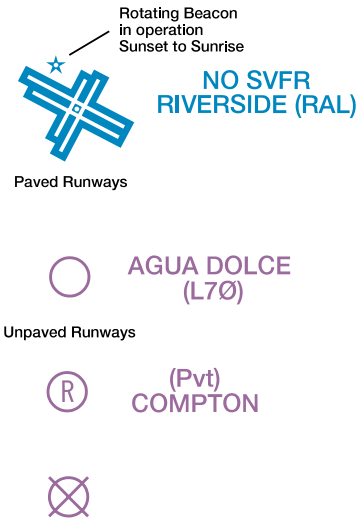
No distinction is made between airports with services and those without services. Runways may be exaggerated to clearly portray the pattern. Hard-surfaced runways which are closed but still exist are included in the charted pattern.

FAR 91 - Fixed wing special VFR operations prohibited.

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

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

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



RADIO AIDS TO NAVIGATION

VHF OMNI-DIRECTIONAL RADIO RANGE (VOR)

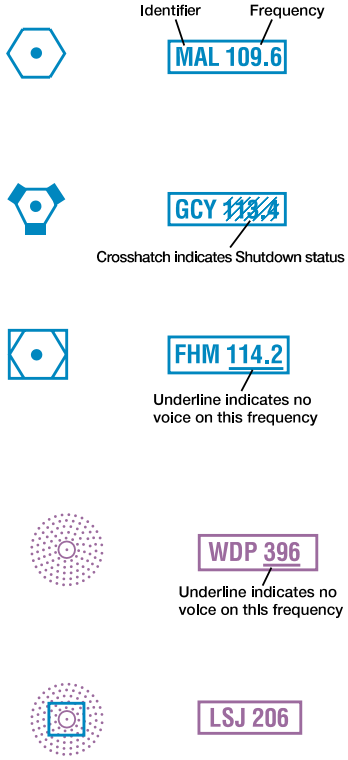
VOR

VORTAC

VOR-DME

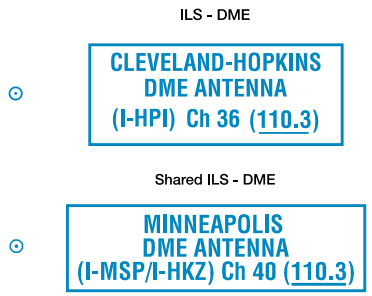
NON-DIRECTIONAL RADIO BEACON (NDB)

NDB-DME



RADIO AIDS TO NAVIGATION

NAVAIDS USED TO DEFINE CLASS B AIRSPACE



AIRSPACE INFORMATION

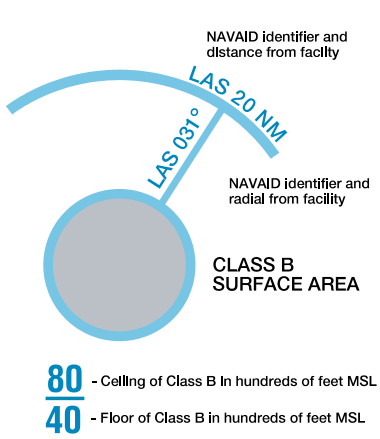
CLASS B AIRSPACE

Appropriate notes as required may be shown.

(Mode C see FAR 91.215/AIM)

All mileages are nautical (NM).

All radials are magnetic.

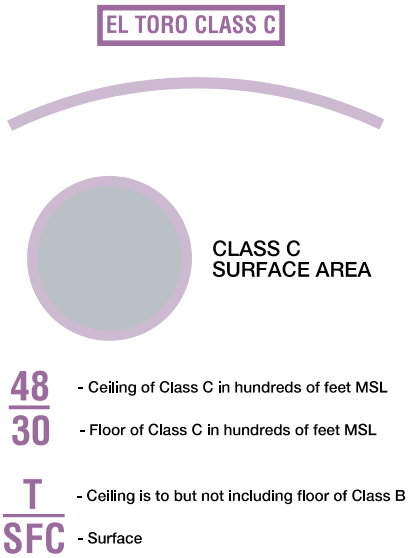


(Floors extending "upward from above" a certain altitude are preceded by a +. Operations at and below these altitudes are outside of Class B Airspace.)

CLASS C AIRSPACE

Appropriate notes as required may be shown.

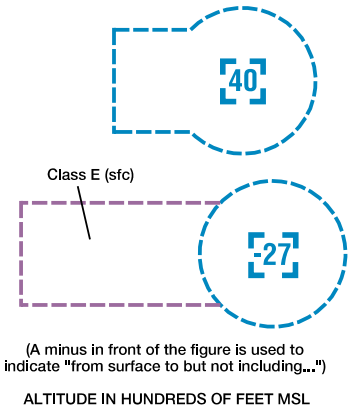
(Mode C see FAR 91.215/AIM)



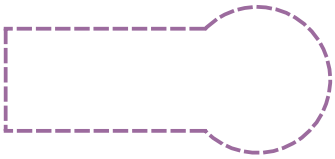
VFR FLYWAY PLANNING CHARTS - Aeronautical Information

AIRSPACE INFORMATION

CLASS D AIRSPACE



CLASS E SURFACE (SFC) AIRSPACE



SPECIAL AIRSPACE AREAS

SPECIAL FLIGHT RULES AREA (SFRA) RELATING TO NATIONAL SECURITY

Example:
Washington DC

Appropriate notes as required may be shown.
Note. Delimiting line not shown when it coincides with International Boundary, projection lines or other linear features.

Washington DC Metropolitan Area Special Flight Rules Area/Flight Restricted Zone restrictions are in effect.
Special regulations apply to all aircraft operations from the surface to but not including Flight Level 180 in the Washington DC Metropolitan Area. Pilots should contact a local FSS for NOTAM information prior to flight in the Washington DC Metropolitan Area.

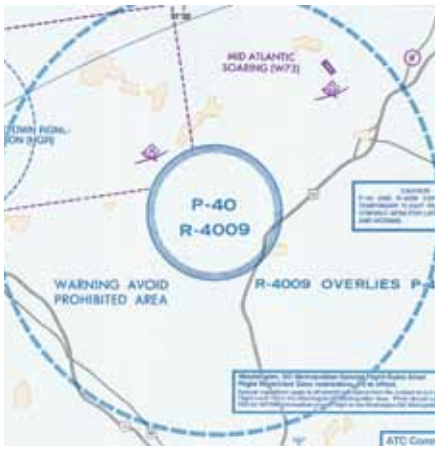
AIRSPACE INFORMATION

FLIGHT RESTRICTED ZONE (FRZ) RELATING TO NATIONAL SECURITY

Example:
Washington DC

TEMPORARY FLIGHT RESTRICTION (TFR) RELATING TO NATIONAL SECURITY

Example:



Appropriate notes as required may be shown.

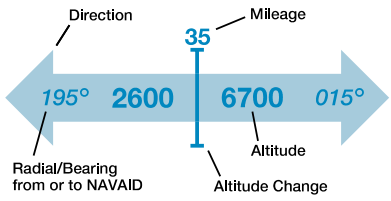
CAUTION
P-40 AND R-4009 EXPANDED BY TEMPORARY FLIGHT RESTRICTION. CONTACT AFSS FOR LATEST STATUS AND NOTAMS.

AIR DEFENSE IDENTIFICATION ZONE (ADIZ)

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

CONTIGUOUS U.S. ADIZ

SUGGESTED VFR FLYWAY AND ALTITUDE



VFR FLYWAY PLANNING CHARTS - Aeronautical Information

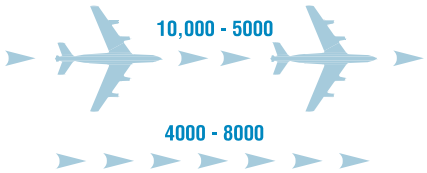
AIRSPACE INFORMATION

IFR ROUTES

Appropriate notes as required may be shown.

Arrival

Departure



VFR TRANSITION ROUTES

Appropriate notes as required may be shown.

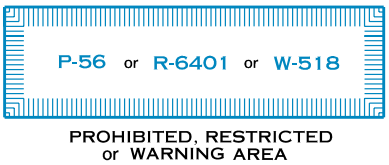
Uni-directional

Bi-directional

SPECIAL USE AIRSPACE

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

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



MILITARY TRAINING ROUTES (MTR)

SPECIAL AIR TRAFFIC RULES / AIRPORT TRAFFIC AREAS (FAR PART 93)

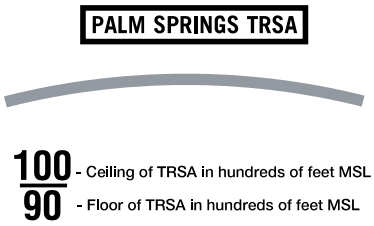
Appropriate boxed note as required shown adjacent to area.

MODE C (FAR 91.215)

Appropriate notes as required may be shown.

AIRSPACE INFORMATION

TERMINAL RADAR SERVICE AREA (TRSA)



MISCELLANEOUS AIRSPACE AREAS

Parachute Jumping Area

Glider Operating Area

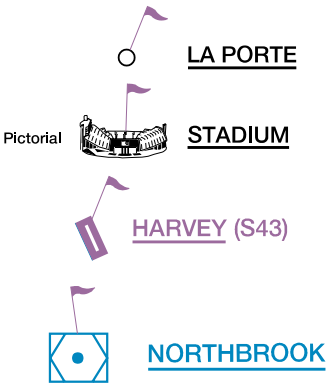
Ultralight Activity

Hang Glider Activity

Unmanned Aircraft Activity

NAVIGATIONAL AND PROCEDURAL INFORMATION

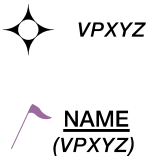
VFR CHECKPOINTS



VFR WAYPOINTS

Stand-Alone

Collocated with Visual Checkpoint



NAVIGATIONAL AND PROCEDURAL INFORMATION

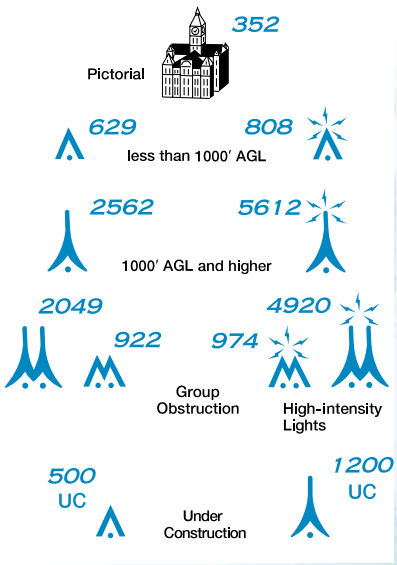
OBSTRUCTIONS

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

AGL heights are not shown.

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

Under Construction or reported and position/ elevation unverified.



NAVIGATIONAL DATA

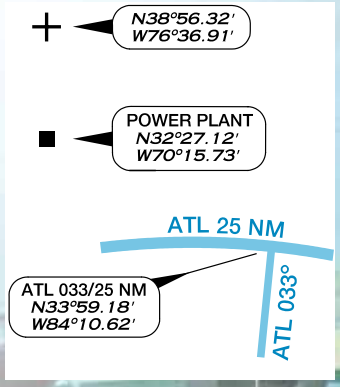


Photo by: Laurie Zaleski

VFR FLYWAY PLANNING CHARTS - Topographic Information

CULTURE

RAILROADS

Single and Multiple Tracks

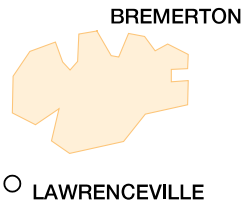
ROADS

Dual-Lane

Divided Highway
Primary

POPULATED PLACES

Built-up Areas
Towns



BOUNDARIES

International

POWER TRANSMISSION LINES

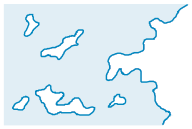
PROMINENT PICTORIALS

LANDMARKS

POWER PLANT

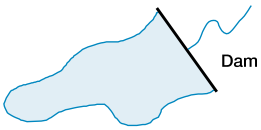
HYDROGRAPHY

SHORELINES



MAJOR LAKES AND RIVERS

RESERVOIRS



RELIEF

SPOT ELEVATIONS

Position Accurate
Mountain Peaks

EXPLANATION OF IFR ENROUTE TERMS AND SYMBOLS

FAA 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 (DoD). Some information on these charts may only apply to military pilots.

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

AIRPORTS

Active airports with hard-surfaced runways of 3,000' or longer are shown on FAA IFR Low Altitude Enroute charts for the contiguous United States. Airports with hard or soft runways of 3,000' or longer are shown on IFR Low Altitude Alaska charts. Airports with hard-surfaced runways of 5,000' or longer are shown on IFR High Altitude Enroute charts for the contiguous United States. Airports with hard or soft runways of 4000' or longer are shown on IFR High Altitude Alaska Enroute charts. Public heliports with an Instrument Approach Procedure (IAP) or requested by the FAA or DoD are depicted on the IFR Low Altitude Enroute charts. Seaplane bases requested by the FAA or DoD are depicted on the IFR Low Altitude Enroute charts. Active airports with approved instrument approach procedures are also shown regardless of runway length or composition. On IFR Low Altitude Enroute charts, a tabulation is provided which identifies airport name, ID and the panel it is located on.

Charted airports are classified according to the following criteria:

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

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

Brown – Airports without a published Instrument Approach Procedure or RADAR MINIMA

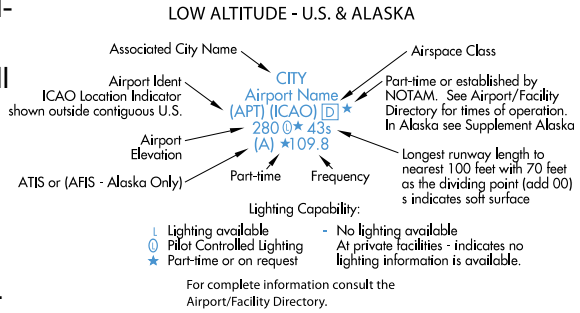
Airports are plotted in their true geographic position unless the symbol conflicts with a radio aid to navigation (NAVAID) at the same location. In such cases, the airport symbol may be displaced, but the relationship between the airport and the NAVAID is retained.

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, 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.



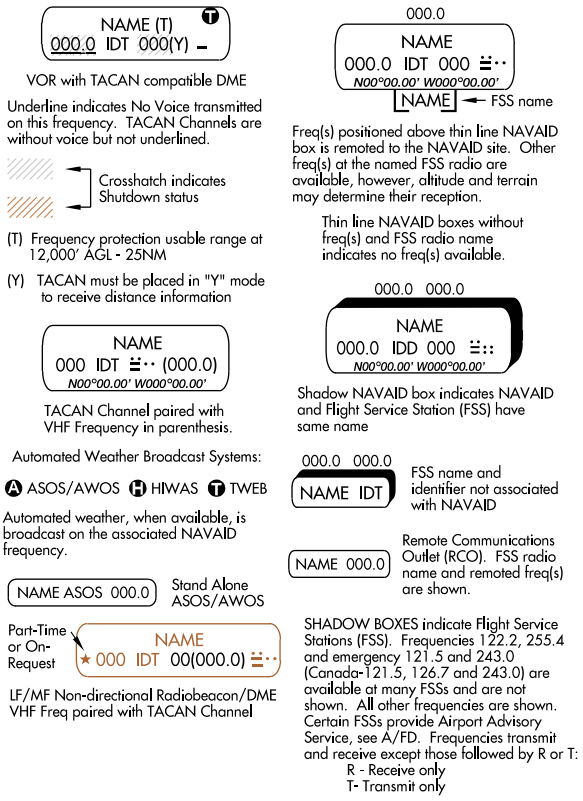
A L symbol following the elevation under the airport name means that runway lights are in operation sunset to sunrise. A 0 symbol indicates there is Pilot Controlled Lighting. A L★ symbol means the lighting is part-time or on request, the pilot should consult the Airport/Facility Directory (A/FD) or appropriate Supplement for light operating procedures. The Aeronautical Information Manual (AIM) thoroughly explains the types and uses of airport lighting aids.

RADIO AIDS TO NAVIGATION (NAVAIDs)

All IFR radio NAVAIDs that have been flightchecked and are operational are shown on IFR Enroute charts. Very High Frequency/Ultrahigh Frequency (VHF/UHF) NAVAIDs, 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 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 shall have the frequency and channel number crosshatched. Use of the NAVAID status "shutdown" is only used when a facility has been decommissioned but cannot be published as such because of pending airspace actions.



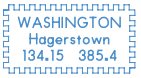
CONTROLLED AIRSPACE

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.

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

Air Route Traffic Control Center (ARTCC)

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



ARTCC Remoted Sites with discrete VHF and UHF frequencies

Class A Airspace is depicted as open area (white) on the Enroute High charts. It consists of airspace from 18,000 Mean Sea Level (MSL) to Flight Level (FL)600.

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 C 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 (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 D 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.

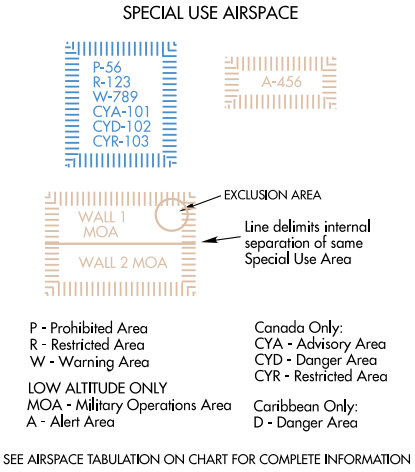
UNCONTROLLED AIRSPACE

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

On Area Charts any uncontrolled airspace boundaries will be depicted with a .012" brown line and a .060" screen brown band on the uncontrolled side, so as to be seen over the terrain.

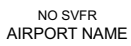
SPECIAL USE AIRSPACE

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 Enroute Low Altitude Charts. Similarly, SUA that extends above 18,000' MSL are shown on Enroute High Altitude Charts. On IFR charts a tabulation is provided which identifies the type of SUA, ID, effective altitude, times of use, controlling agency and the panel it is located on.



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 Directory/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 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 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)

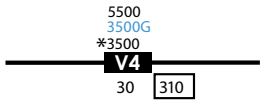
In this system VOR airways—airways based on VOR or VORTAC NAVAIDs—are depicted in black and identified by a "V" (Victor) followed by the route number (e.g., "V12"). In Alaska and Canada, some segments of low-altitude airways are based on LF/MF NAVAIDs and are charted in brown instead of black. Routes from a UHF facility to a LF/MF facility change from black to brown at the midpoint.

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 in the contiguous U.S.

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., Minimum En Route IFR Altitude, Minimum Obstruction Clearance Altitude, Maximum Authorized Altitude (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.



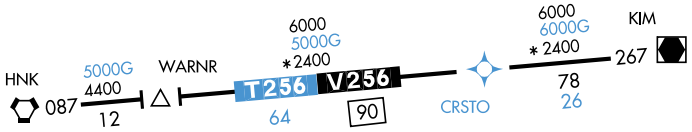
Victor Route (with RNAV/GPS MEA shown in blue)

AREA NAVIGATION (RNAV) "T" ROUTE SYSTEM

The FAA has created new low altitude area navigation (RNAV) "T" routes for the enroute and terminal environments. The RNAV routes will provide more direct routing for IFR aircraft and enhance the safety and efficiency of the National Airspace System. To utilize these routes aircraft are required to be equipped with IFR approved 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, and "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 bearings, and MEAs) will also be printed in blue. Magnetic reference bearings will be shown originating from a waypoint, fix/reporting point or NAVAID. A GNSS minimum IFR enroute altitude (MEA) for each segment will be established to ensure obstacle clearance and communications reception. MEAs will be identified with a "G" suffix.

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.



OFF ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)

The Off Route Obstruction Clearance Altitude (OROCA) is depicted on Enroute Low Altitude and Pacific charts and is represented in thousands and hundreds of feet above MSL. OROCAs are shown in every 30 x 30 minute quadrant on Area Charts, every one degree by one degree quadrant for U.S. Low Altitude Enroute Charts and every two degree by two degree quadrant on Alaska Low Enroute Charts.

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 and longitude including data 4 NM outside the quadrant. In this example the OROCA represents 12,500 feet.

12^{5}

OROCA is computed just as the Maximum Elevation Figure (MEF) found on Visual Flight Rule 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. OROCAs can be found over all land masses and open water areas containing man-made obstructions (such as oil rigs).

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 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 1,500 feet AGL.

Military Training Routes 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.

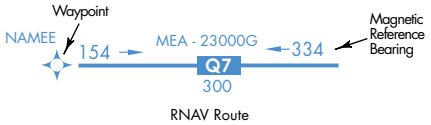
MTRs for particular chart pairs (ex. L1/2, etc.) are alphabetically, then numerically tabulated. The tabulation includes MTR type and unique ident and altitude range.

JET ROUTE SYSTEM (HIGH ALTITUDE ENROUTE CHARTS)

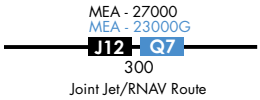
Jet routes are based on VOR or VORTAC NAVAIDs, and are depicted in black with a "J" identifier followed by the route number (e.g., "J12"). In Alaska, Russia and Canada some segments of jet routes are based on LF/MF NAVAIDs and are shown in brown instead of black. Routes from a UHF facility to a LF/MF facility change from black to brown at the midpoint.

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 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 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/ 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 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 or appropriate Supplement for DME information. 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 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 AERONAUTICAL CHART SYMBOLS

IFR Enroute Low/High Altitude (U.S., Pacific & Alaska Charts)

Oceanic Route Planning Charts, North Atlantic, WATRS and North Pacific Route Charts

IFR ENROUTE LOW/HIGH ALTITUDE U.S., PACIFIC & ALASKA CHARTS

AIRPORTS

AIRPORT DATA

LOW/HIGH ALTITUDE

Facilities in BLUE or GREEN have an approved Instrument Approach Procedure and/or RADAR MINIMA published in either the FAA Terminal Procedures Publications 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 Approach Procedure or RADAR MINIMA.

All IAP Airports are shown on the Low Altituide Charts.

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

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

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

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

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

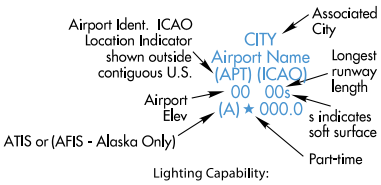
The airport identifier in parentheses follows the airport name or Pvt.

Airport symbol may be offset for enroute navigational aids.

Pvt - Private Use

AIRPORT DATA DEPICTION

LOW ALTITUDE - U.S. & ALASKA



Lighting Capability:

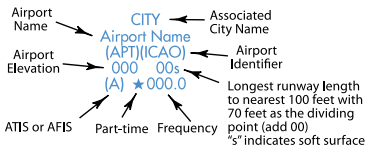
- L Lighting available
- Ⓛ Pilot Controlled Lighting
- ★ Part-time or on request
- – No lighting available. At private facilities - indicates no lighting information available.

For complete information consult the Airport/Facility Directory.

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.
8. Airport Ident ICAO Location Indicator shown outside contiguous U.S.
9. AFIS Alaska only

HIGH ALTITUDE - U.S.

HIGH ALTITUDE - ALASKA



AIRPORTS

CIVIL

LOW/ HIGH ALTITUDE

CIVIL AND MILITARY

LOW/ HIGH ALTITUDE

MILITARY

LOW/ HIGH ALTITUDE

SEAPLANE - CIVIL

LOW ALTITUDE

HELIPORT

LOW ALTITUDE

EMERGENCY USE ONLY

PACIFIC ONLY

RADIO AIDS TO NAVIGATION

VHF OMNIDIRECTIONAL RADIO RANGE (VOR)

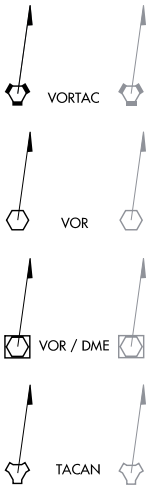
DISTANCE MEASURING EQUIPMENT (DME)

TACTICAL AIR NAVIGATION (TACAN)

LOW/ HIGH ALTITUDE

VHF / UHF Data is depicted in Black
LF / MF Data is depicted in Brown

COMPASS ROSES are oriented to Magnetic North of the NAVAID which may not be adjusted to the charted isogonic values.



HIGH ONLY

(L) Frequency Protection usable range at 18,000' AGL - 40NM
(T) Frequency Protection usable range at 12,000' AGL - 25NM
"L" and "T" category NAVAIDS located off Jet Routes are depicted in screen black. NAVAIDS without classification are "H" category.

NON-DIRECTIONAL RADIOBEACON (NDB)

MARINE RADIOBEACON (RBN)

LOW/ HIGH ALTITUDE

NDB or RBN with Magnetic North Indicator

NDB with DME

COMPASS LOCATOR BEACON

LOW ALTITUDE

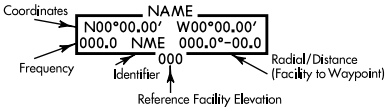
ILS LOCALIZER

LOW ALTITUDE

ILS Localizer Course with additional navigation function.

VOR/DME RNAV WAYPOINT DATA

HIGH ALTITUDE - ALASKA



RADIO AIDS TO NAVIGATION

NAVIGATION AND COMMUNICATION BOXES

LOW/ HIGH ALTITUDE

VOR with TACAN compatible DME

Underline indicates No Voice Transmitted on this frequency

TACAN channels are without voice but not underlined

Crosshatch indicates Shutdown Status

(T) Frequency Protection - usable range 25 NM at 12000' AGL

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

(A) ASOS/AWOS - Automated Surface Observing Station/Automated Weather Observing Station

(H) HIWAS - Hazardous Inflight Weather Advisory Service

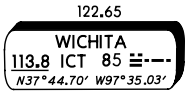
(T) TWEB - Transcribed Weather Broadcast (Alaska only)

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

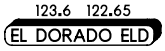
Part-time or On-Request

NDB with DME

DME channel and paired VHF frequency are shown



FSS associated with a NAVAID



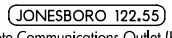
Name and identifier of FSS not associated with NAVAID

Shadow NAVAID Boxes indicate Flight Service Station (FSS) locations. Frequencies 122.2, 255.4 and emergency 121.5 and 243.0 are available at many FSSs and are not shown. All other frequencies are shown above the box.

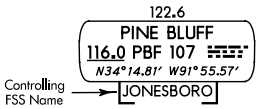
Certain FSSs provide Local Airport Advisory (LAA) on 123.6.

Frequencies transmit and receive except those followed by R or T: R - Receive only T - Transmit only

In Canada, shadow boxes indicate FSSs with standard group frequencies of 121.5, 126.7 and 243.0.



Remote Communications Outlet (RCO)
FSS name and remoted frequency are shown



Thin Line NAVAID Boxes without frequencies and controlling FSS name indicate no FSS frequencies available. Frequencies positioned above 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.

Morse Code is not shown in NAVAID boxes on High Altitude Charts.

⊙ Flight Service Station (FSS), Remote Communications Outlet (RCO) or Automated Weather Observing Station (AWOS/ASOS) not associated with a charted NAVAID or airport.

Stand Alone ASOS/AWOS

IFR ENROUTE LOW/HIGH ALTITUDE U.S., PACIFIC & ALASKA CHARTS

AIRSPACE INFORMATION

LOW ALTITUDE AIRWAYS

HIGH ALTITUDE ROUTES

LOW/HIGH ALTITUDE

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

VOR Airway/ Jet Route

LF/MF Airway

Uncontrolled LF/MF Airway

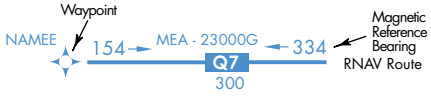
Oceanic Route

ATS Route

RNAV Route GNSS required

RNAV Helicopter Route GNSS required

HIGH ALTITUDE

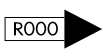


Joint Jet/RNAV Route

SINGLE DIRECTION ROUTES

Other times routes revert to bi-directional

HIGH ALTITUDE



AIR TRAFFIC SERVICE (ATS) ROUTE

DIRECTION OF FLIGHT INDICATOR

LOW ALTITUDE - CANADA

SUBSTITUTE ROUTE

LOW/ HIGH ALTITUDE

All relative and supporting data shown in brown

See NOTAMs or appropriate publication for specific information

UNUSABLE ROUTE

LOW ALTITUDE

HIGH ALTITUDE

BY-PASS ROUTE

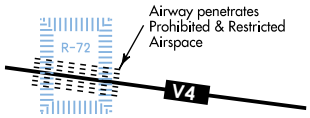
HIGH ALTITUDE


Jet Route centerline by-passing a facility which is not part of that specific route

AIRSPACE INFORMATION

AIRWAY RESTRICTION

LOW ALTITUDE



MILITARY TRAINING ROUTES (MTR)

LOW ALTITUDE

MTRs 5 NM or less both sides of centerline

MTRs greater than 5 NM 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

FIXES/ATC REPORTING REQUIREMENTS

LOW/HIGH ALTITUDE

VHF/UHF LF/MF

Fix-Compulsory Position Report

Coordinates are shown for compulsory, offshore and holding fixes

Fix-Non-Compulsory Position Report

Off-set arrows indicate facility forming a fix


Airway away from VHF/UHF NAVAID


Airway toward LF/MF NAVAID

RNAV


Waypoint-Compulsory Position Report

Coordinates are shown for off-airway and offshore waypoints


Waypoint-Non-Compulsory Position Report

Coordinates are shown for off-airway and offshore waypoints

Reporting Functions at NAVAIDs


VOR-Compulsory Position Report


VOR-Non-Compulsory Position Report


VOR/DME-Compulsory Position Report


VOR/DME-Non-Compulsory Position Report


VORTAC-Compulsory Position Report


VORTAC-Non-Compulsory Position Report


NDB-Compulsory Position Report


NDB-Non-Compulsory Position Report


NDB/DME-Compulsory Position Report


NDB/DME-Non-Compulsory Position Report

IFR ENROUTE LOW/HIGH ALTITUDE U.S., PACIFIC & ALASKA CHARTS

AIRSPACE INFORMATION

RADIALS AND BEARINGS

All radials and bearings are magnetic

LOW/ HIGH ALTITUDE

000 — Radial outbound from a VHF / UHF NAVAID

000 — Bearing inbound to a LF / MF NAVAID

FACILITY LOCATORS

LOW/ HIGH ALTITUDE

000.0 NME 00 — Facility Locators used with radial / bearing lines in the formation of reporting points

000 NME

000.0 NME 00 — Crosshatch indicates Shutdown Status of NAVAID

MILEAGES

All Mileages are Nautical (NM)

LOW /HIGH ALTITUDE

000 000 — Total Mileage between Compulsory Reporting Points and/or NAVAIDs

00 00 00 — Mileage between other Fixes, NAVAIDs and/or Mileage Breakdown

x x — Mileage Breakdown or Computer Navigation Fix (CNF)(no ATC function)

(RCRCP) — Five-letter identifier in parenthesis indicates CNF with no ATC function

DISTANCE MEASURING EQUIPMENT (DME) FIX

LOW/ HIGH ALTITUDE

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

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

MINIMUM ENROUTE ALTITUDE (MEA)

All Altitudes Are MSL Unless Otherwise Noted

LOW ALTITUDE

3500 3000G V4 — RNAV/GPS MEA — 3500 A0

5500 3500 V4 — Directional MEA — 5500 3500 A0

HIGH ALTITUDE

MEA-31000 J4 — Shown along Routes when other than 18,000'

MINIMUM ENROUTE ALTITUDE (MEA) GAP

LOW/HIGH ALTITUDE

V4 MEA GAP — MEA is established when there is a gap in navigation signal coverage

MAXIMUM AUTHORIZED ALTITUDE (MAA)

All Altitudes Are MSL Unless Otherwise Noted

LOW ALTITUDE

MAA-15500 V4 — MAA-15500 A0

HIGH ALTITUDE

MAA-41000 J4 — Shown along Routes when other than 45,000'

AIRSPACE INFORMATION

MINIMUM OBSTRUCTION CLEARANCE ALTITUDE (MOCA)

All Altitudes Are MSL Unless Otherwise Noted

LOW ALTITUDE

5500 *3500 V4 — MOCA — 5500 *3500 A0

7000G *6300 T266 112

CHANGEOVER POINT

LOW/ HIGH ALTITUDE

00 / 00 — VOR Changeover Point giving mileage to NAVAIDs (Not shown at midpoint locations)

ALTITUDE CHANGE

LOW/ HIGH ALTITUDE

MEA, MOCA and / or MAA change at other than NAVAIDs

MINIMUM CROSSING ALTITUDE (MCA)

LOW/ HIGH ALTITUDE

SARAH V6 4000 SW — DANEL V6 4000 SW — T244 HANAH 7400 SE

MINIMUM RECEPTION ALTITUDE (MRA)

LOW/HIGH ALTITUDE

PAIGE MRA 4500 — MIKEL MRA 4500

HOLDING PATTERNS

RNAV Holding Pattern Magnetic Reference Bearing is determined by the isogonic value at the waypoint or fix.

LOW/HIGH ALTITUDE

NAMEE N00°00.00' W00°00.00' — V4 — NAMEE N00°00.00' W00°00.00' — Holding reporting points have coordinate values shown

Left Turn — Right Turn

(IAS) Holding Pattern with max. restricted airspeed 210K applies to altitudes above 6000' to and including 14000' 175K applies to all altitudes

IAS: Indicated Airspeed

Magnetic Reference Bearing 245 — NAMEE — Waypoint — RNAV Holding

AIR DEFENSE IDENTIFICATION ZONE (ADIZ)

LOW/ HIGH ALTITUDE

CONTIGUOUS U.S. ADIZ

ALASKA ADIZ

CANADA ADIZ

Adjoining ADIZ

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC)

LOW/ HIGH ALTITUDE

NEW YORK

WASHINGTON

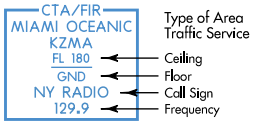
WASHINGTON Hagerstown 134.15 385.4 — ARTCC Remoted Sites with discrete VHF and UHF frequencies

IFR ENROUTE LOW/HIGH ALTITUDE U.S., PACIFIC & ALASKA CHARTS

AIRSPACE INFORMATION

AIR TRAFFIC SERVICE IDENTIFICATION DATA

LOW/ HIGH ALTITUDE

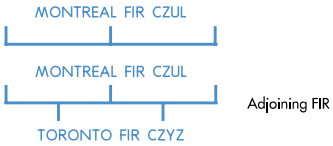


ALTIMETER SETTING CHANGE

LOW ALTITUDE

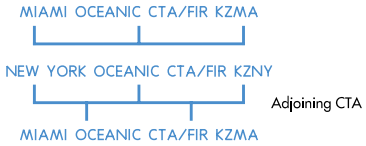
FLIGHT INFORMATION REGIONS (FIR)

LOW/ HIGH ALTITUDE



CONTROL AREAS (CTA)

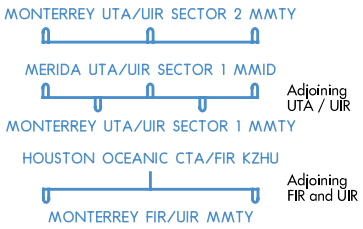
LOW/ HIGH ALTITUDE



UPPER INFORMATION REGIONS (UIR)

UPPER CONTROL AREAS (UTA)

HIGH ALTITUDE



ADDITIONAL CONTROL AREAS

LOW ALTITUDE

HIGH ALTITUDE

OFF ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)

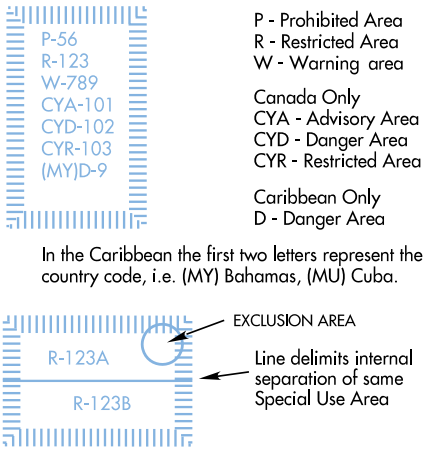
LOW ALTITUDE

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.

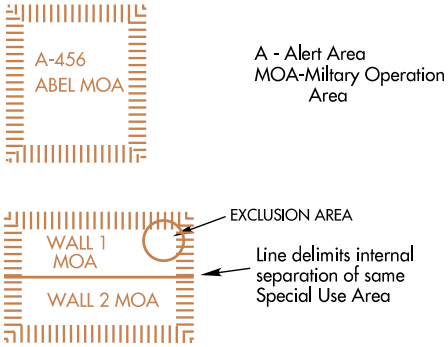
AIRSPACE INFORMATION

SPECIAL USE AIRSPACE

LOW/HIGH ALTITUDE



LOW ALTITUDE



SEE AIRSPACE TABULATION ON EACH CHART FOR COMPLETE INFORMATION ON :

- AREA IDENTIFICATION
- EFFECTIVE ALTITUDES
- OPERATING TIMES
- CONTROLLING AGENCY A/G CALL PANEL

IFR ENROUTE LOW/HIGH ALTITUDE U.S., PACIFIC & ALASKA CHARTS

AIRSPACE INFORMATION

CONTROLLED AIRSPACE

HIGH ALTITUDE

CLASS A AIRSPACE

Open Area (White)

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.

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.

LOW ALTITUDE

CLASS B AIRSPACE

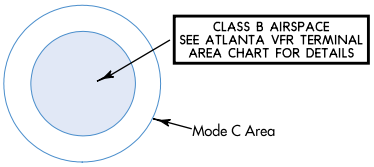
Screened Blue with a Solid Blue Outline

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

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)



LOW ALTITUDE

CLASS C AIRSPACE

Screened Blue with a Solid Blue Dashed Outline

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 10 NM. Class C airspace is also indicated by the letter C in a box following the airport name.

LOW ALTITUDE

CLASS D AIRSPACE

Open Area (White)

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

AIRSPACE INFORMATION

CONTROLLED AIRSPACE

LOW ALTITUDE

CLASS E AIRSPACE

Open Area (White)

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.

CONTROLLED AIRSPACE

Canada Only

LOW ALTITUDE

CLASS B AIRSPACE

Screened Brown Checkered Area

Controlled airspace above 12,500' MSL

UNCONTROLLED AIRSPACE

LOW/ HIGH ALTITUDE

CLASS G AIRSPACE

Screened Brown Area

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.

CANADIAN AIRSPACE

Appropriate notes as required may be shown.

LOW/HIGH ALTITUDE

AIRSPACE CLASSIFICATION (SEE CANADA FLIGHT SUPPLEMENT) AND OPERATIONAL REQUIREMENTS (DOD USERS SEE DOD AREA PLANNING AP/1) MAY DIFFER BETWEEN CANADA AND THE UNITED STATES

NOTE: REFER TO CURRENT CANADIAN CHARTS AND FLIGHT INFORMATION PUBLICATIONS FOR INFORMATION WITHIN CANADIAN AIRSPACE

AIRSPACE OUTSIDE OF U.S.

Other than Canada

Appropriate notes as required may be shown.

DOD USERS
REFER TO CURRENT DOD (NGA) CHARTS AND FLIGHT INFORMATION PUBLICATIONS FOR INFORMATION OUTSIDE OF U.S. AIRSPACE

IFR ENROUTE LOW/HIGH ALTITUDE U.S., PACIFIC & ALASKA CHARTS

NAVIGATIONAL AND PROCEDURAL INFORMATION

ISOGONIC LINE AND VALUE

LOW/ HIGH ALTITUDE

8°W

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

TIME ZONE

LOW/ HIGH ALTITUDE

Central Std +6=UTC | Eastern Std +5=UTC

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

ALL TIME IS COORDINATED UNIVERSAL TIME (UTC)

ENLARGEMENT AREA

LOW/ HIGH ALTITUDE

JACKSONVILLE AREA CHART A-1

MATCH MARK

LOW/HIGH ALTITUDE

NOTES

LOW/ HIGH ALTITUDE

FAA AIR TRAFFIC SERVICE OUTSIDE U.S. AIRSPACE IS PROVIDED IN ACCORDANCE WITH ARTICLE 12 AND ANNEX 11 OF ICAO CONVENTION. ICAO CONVENTION NOT APPLICABLE TO STATE AIRCRAFT BUT COMPLIANCE WITH ICAO STANDARDS AND PRACTICES IS ENCOURAGED.

CAUTION: POSSIBLE DAMAGE AND/OR INTERFERENCE TO AIRBORNE RADIO DUE TO HIGH LEVEL RADIO ENERGY IN THE VICINITY OF R-2206

CAUTION: ACCURACY OF AIR TRAFFIC SERVICES RELATIVE TO HAVANA FIR CANNOT BE CONFIRMED. CONSULT NOTAMS.

North American Datum of 1983 (NAD 83), for charting purposes is considered equivalent to World Geodetic System 1984 (WGS 84).

MORSE CODE

LOW/ HIGH ALTITUDE

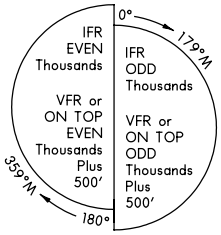
A	·–	N	–·	1	·————
B	–···	O	–––	2	··———
C	–·–·	P	·––·	3	···––
D	–··	Q	––·–	4	····–
E	·	R	·–·	5	·····
F	··–·	S	···	6	–····
G	––·	T	–	7	––···
H	····	U	··–	8	–––··
I	··	V	···–	9	––––·
J	·–––	W	·––	0	–––––
K	–·–	X	–··–		
L	·–··	Y	–·––		
M	––	Z	––··		

NAVIGATIONAL AND PROCEDURAL INFORMATION

CRUISING ALTITUDES

U.S. only

LOW ALTITUDE



VFR above 3000′ AGL unless otherwise authorized by ATC

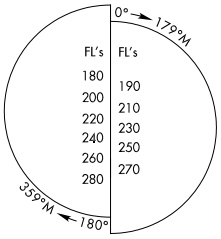
IFR outside controlled airspace

IFR within controlled airspace as assigned by ATC

All courses are magnetic

HIGH ALTITUDE

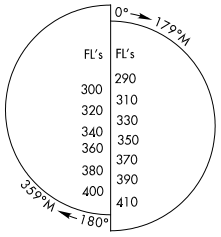
18,000′ MSL to FL280



VFR or VFR On Top add 500′

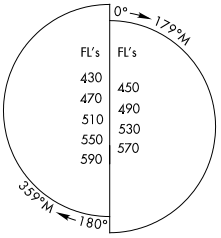
No VFR flights within Class A Airspace above 3000′ AGL unless otherwise authorized by ATC.

RVSM Levels FL290 to FL410



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

FL430 and Above



IFR within controlled airspace as assigned by ATC

All courses are magnetic

IFR ENROUTE LOW/HIGH ALTITUDE U.S., PACIFIC & ALASKA CHARTS

CULTURE

BOUNDARIES

International

LOW/ HIGH ALTITUDE

Omitted when coincident with ARTCC or FIR

U.S. / Russia Maritime Line

LOW/ HIGH ALTITUDE

RUSSIA
UNITED STATES

Date Line

LOW/ HIGH ALTITUDE

INTERNATIONAL DATE LINE MONDAY
SUNDAY

HYDROGRAPHY

SHORELINE

TOPOGRAPHY

TERRAIN

Area Charts

2000
2000
2000
4000
5600

OCEANIC ROUTE PLANNING CHARTS

AIRPORTS

AIRPORT DATA

Airport of Entry (AOE) are shown with four letter ICAO Identifier

LANDPLANE-CIVIL
Refueling and repair facilities for normal traffic.

HONOLULU INTL (PHNL)

LANDPLANE-CIVIL AND MILITARY
Refueling and repair facilities for normal traffic.

HILO INTL (PHTO)

LANDPLANE-MILITARY
Refueling and repair facilities for normal traffic.

KALAELOA (PHJR)

RADIO AIDS TO NAVIGATION

VHF OMNIDIRECTIONAL RADIO RANGE (VOR)

DISTANCE MEASURING EQUIPMENT (DME)

VOR TACAN (VORTAC)

TACTICAL AIR NAVIGATION (TACAN)

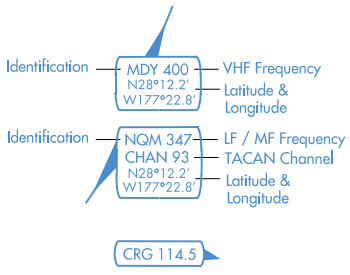
	NARC/WATRS	NPRC
VOR	⊙	⬡
VOR / DME	⊙	⬡
VORTAC	⊙	⬢
TACAN	⊙	⬢

NON-DIRECTIONAL RADIOBEACON (NDB)

DISTANCE MEASURING EQUIPMENT (DME)

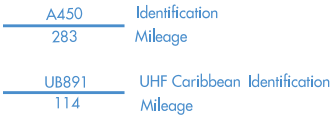
	NARC/WATRS	NPRC
NDB	⊙	⊙
NDB / DME	⊙	⊙

IDENTIFICATION BOX



AIRSPACE INFORMATION

AIR TRAFFIC SERVICE (ATS) / OCEANIC ROUTES
Note: Mileages are Nautical (NM)



ATS SINGLE DIRECTION ROUTE

AERIAL REFUELING TRACKS

AIR DEFENSE IDENTIFICATION ZONE (ADIZ)

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC)

FLIGHT INFORMATION REGIONS (FIR) AND/OR (CTA)

UPPER INFORMATION REGIONS (UIR)

UPPER CONTROL AREAS (UTA)

OCEANIC CONTROL AREAS (OCA) AND /OR (CTA /FIR)

ADDITIONAL OCEANIC CONTROL AREAS
Note: Limits not shown when coincident with Warning Areas.

BUFFER ZONE

NON-FREE FLYING ZONE

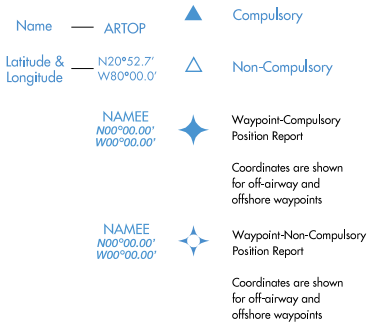
OCEANIC ROUTE PLANNING CHARTS

AIRSPACE INFORMATION

NORTH ATLANTIC / MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS (NAT/MNPS)

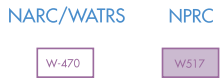
FIXES/ATC REPORTING REQUIREMENTS

In congested areas select fixes have coordinates, use, compl/noncompl tabulated.



SPECIAL USE AIRSPACE

Warning Area



12 Mile Limit

UNCONTROLLED AIRSPACE

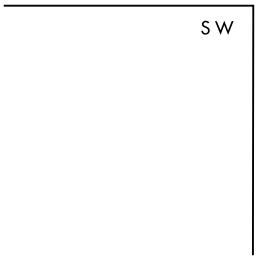
NAVIGATIONAL AND PROCEDURAL INFORMATION

MILEAGE CIRCLES

Note: Mileages are Nautical (NM)

Time Zone
Note: All time is Coordinated Universal (Standard) Time (UTC)

Overlap Marks North Pacific Route Chart (NPRC) Only

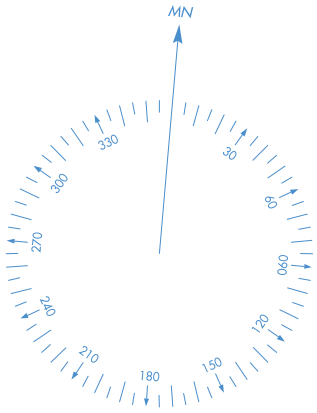


NAVIGATIONAL AND PROCEDURAL INFORMATION

COMPASS ROSE

Note: Compass Roses oriented to Magnetic North

NPRC Only



NOTES

WARNING

NPRC Only

CULTURAL BOUNDARIES

INTERNATIONAL

MARITIME

NPRC Only

DATE LINE

NPRC Only

HYDROGRAPHY

SHORELINES

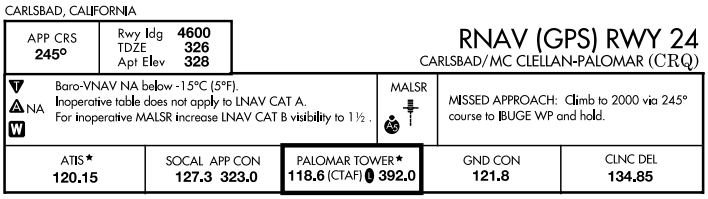
EXPLANATION OF TPP TERMS AND SYMBOLS

The discussions and examples in this section will be based primarily on the IFR (Instrument Flight Rule) Terminal Procedures Publication (TPP). Other IFR products use similar symbols in various colors (see Section 2 of this guide). The publication 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 TPP charts.

FAA charts are prepared in accordance with specifications of the Interagency Air Cartographic Committee (IACC), which 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.

PILOT BRIEFING INFORMATION

The pilot briefing information format consists of three horizontal rows of boxed procedure-specific information along the top edge of the chart. Frequencies and


CARLSBAD, CALIFORNIA

APP CRS 245°	Rwy Idg 4600 TDZE 326 Apt Elev 328	RNAV (GPS) RWY 24 CARLSBAD/MC CLELLAN-PALOMAR (CRQ)		
T A NA W	Baro-VNAV NA below -15°C (5°F). Inoperative table does not apply to LNAV CAT A. For inoperative MALSR increase LNAV CAT B visibility to 1½.	MALSR	MISSED APPROACH: Climb to 2000 via 245° course to IBUGE WP and hold.	
ATIS* 120.15	SOCAL APP CON 127.3 323.0	PALOMAR TOWER* 118.6 (CTAF) 392.0	GND CON 121.8	CLNC DEL 134.85

channel, course and elevation values are charted in bold type. The top row contains the primary procedure navigation information, final approach course, landing distance available, touchdown zone, threshold and airport elevations. The middle row contains procedure notes and limitations, icons indicating if nonstandard alternate and/or takeoff minimums apply, approach lighting symbology, and the full text description of the missed approach procedure. The bottom row contains air to ground communication facilities and frequencies in the order in which they are used during an approach with the tower frequency box bolded.

When T appears in the Notes section, it signifies the airport has nonstandard IFR takeoff minimums and/or Departure Procedures published in Section L of the TPP.

CIVIL USERS NOTE: FAR 91 prescribes standard takeoff rules and establishes takeoff minimums for certain operators as follows: (1) Aircraft having two engines or less - one statute mile. (2) Aircraft having more than two engines - one-half statute mile. These standard minima apply in the absence of any different minima listed in Section L of the TPP.

ALL USERS: Airports that have Departure Procedures (DPs) designed specifically to assist pilots in avoiding obstacles during the climb to the minimum enroute altitude, and/or airports that have civil IFR takeoff minimums other than standard, are listed in Section L of the TPP by city. Takeoff Minimums and Departure Procedures apply to all runways unless otherwise specified. Altitudes, unless otherwise indicated, are minimum altitudes in MSL.

DPs specifically designed for obstacle avoidance may be described in Section L of the TPP in text or published as a graphic procedure. Its name will be listed, and it can be found in either the TPPs (civil) or a separate Departure Procedure volume (military), as appropriate. Users will recognize graphic obstacle DPs by the word "(OBSTACLE)" included in the procedure title; e.g., TETON TWO (OBSTACLE). If not assigned another DP or radar vector by ATC, this procedure should be flown if visual avoidance of terrain/obstacles cannot be maintained.

Graphic DPs designed by ATC to standardize traffic flows, ensure aircraft separation and enhance capacity are referred to as "Standard Instrument Departures (SIDs)". SIDs also provide obstacle clearance and are published under the appropriate airport section. ATC clearance must be received prior to flying a SID.

NOTE: Graphic Departure Procedures that have been designed primarily to assist Air Traffic Control in providing air traffic separation (as well as providing obstacle clearance) are usually assigned by name in an ATC clearance and are not listed by name in Section L of the TPP.

When A appears in the Notes section of the approach chart, it indicates non-standard IFR alternate minimums exist for the airport. When an alternate airport is required, standard IFR alternate minimums apply. Precision approach procedures require a 600' ceiling and 2 statute miles visibility; nonprecision approaches require an 800' ceiling and 2 statute miles visibility. This information is found in Section M of the TPP. If A NA appears, alternate minimums are not authorized due to unmonitored facility or absence of weather reporting service. Civil pilots see FAR 91.

The W symbol indicates that outages of the WAAS vertical guidance may occur daily at this location due to initial system limitations. WAAS NOTAMs for vertical outages are not provided for this approach. Use LNAV minima for flight planning at these locations, whether as a destination or alternate. For flight operations at these locations, when the WAAS avionics indicate that LNAV/VNAV or LPV service is available, then vertical guidance may be used to complete the approach using the displayed level of service. Should an outage occur during the procedure, reversion to LNAV minima may be required. As the WAAS coverage is expanded, the W will be removed.

PLANVIEW

The data on the planview is drawn to scale, unless one of the following three charting devices are utilized: concentric rings, scale breaks or inset box(es). Most non-RNAV instrument procedure charts depict a reference or distance circle (not to be confused with the concentric rings) which is normally centered on the Final Approach Fix (FAF) and has a radius of 10NM. This circle is intended only to provide a sense of distance and scale. Data both within and without the circle is drawn to scale, unless a scale break symbol is utilized.

In many cases, obstructions close to the airport can be depicted within the parameters of the airport sketch.

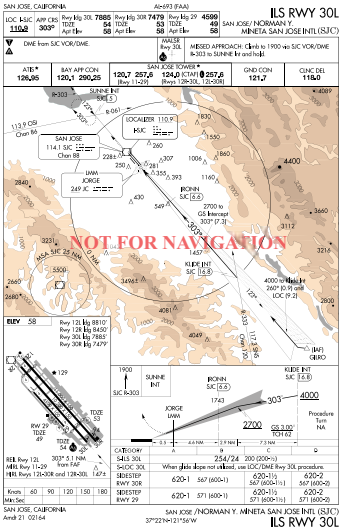
Terrain Depiction

Terrain will be depicted with contour lines in shades of brown, in the planview portion of all IAPs at airports that meet the following criteria:

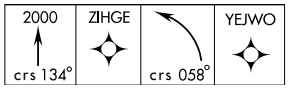
– If the terrain within the planview exceeds 4,000 feet above the airport elevation, or

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

Approximately 1200 airports throughout the US currently meet the above criteria.



MISSED APPROACH ICONS



Boxed MAP icons, placed in the profile section, are intended to provide quick at-a-glance intuitive guidance to the pilot to supplement, not replace, the textual missed approach instructions in the briefing strip. These step-by-step instructional graphics depict direction of turn, next heading/course/bearing/track, next altitude, etc. to give the pilot the "up and out" initial steps of the missed approach.

RNAV CHART MINIMA

RNAV instrument approach procedure charts will now incorporate all types of approaches using Area Navigation systems, both ground based and satellite based. Below is an explanation of the RNAV minima.

The standard format for RNAV minima (and landing minima) is as shown below.

RNAV minima are dependent on navigational equipment

CATEGORY	A	B	C	D	E
LPV DA	296/40 250 (300 - ¾)				
LNAV/ VNAV DA	500/50 454 (500-1)				
LNAV MDA	640/40 594 (600-¾)		640/50 594 (600-1)	640/60 594 (600-1¼)	640-1½ 594 (600-1½)
CIRCLING	640-1½ 594 (600-1½)			640-2 594 (600-2)	740-2½ 694 (700-2½)

capability, as stated in the applicable AFM or AFMS, or other FAA approved document, and as outlined below.

GLS (Global Navigation Satellite System (GNSS) Landing System)

The GLS (NA) Minima line will be removed from the existing RNAV (GPS) approach charts when LPV minima is published.

LPV (An Approach Procedure with Vertical Guidance (APV) and precise lateral based on WAAS

Must have WAAS (Wide Area Augmentation System) avionics approved for LPV approach.

LNAV/VNAV (Lateral Navigation/Vertical Navigation)

Must have either:

- WAAS avionics approved for LNAV/VNAV approach, or
- A certified Baro-VNAV system with an IFR approach approved GPS, or
- A certified Baro-VNAV system with an IFR approach approved WAAS, or
- An approach certified RNP-0.3 system.

Other RNAV approach systems require special approval.

RNAV NOTES:

1. LNAV/VNAV minima not applicable for Baro-VNAV equipment if chart is annotated “Baro-VNAV NA” or when below the minimum published temperature, e.g., Baro-VNAV NA below -17° C (2° F).

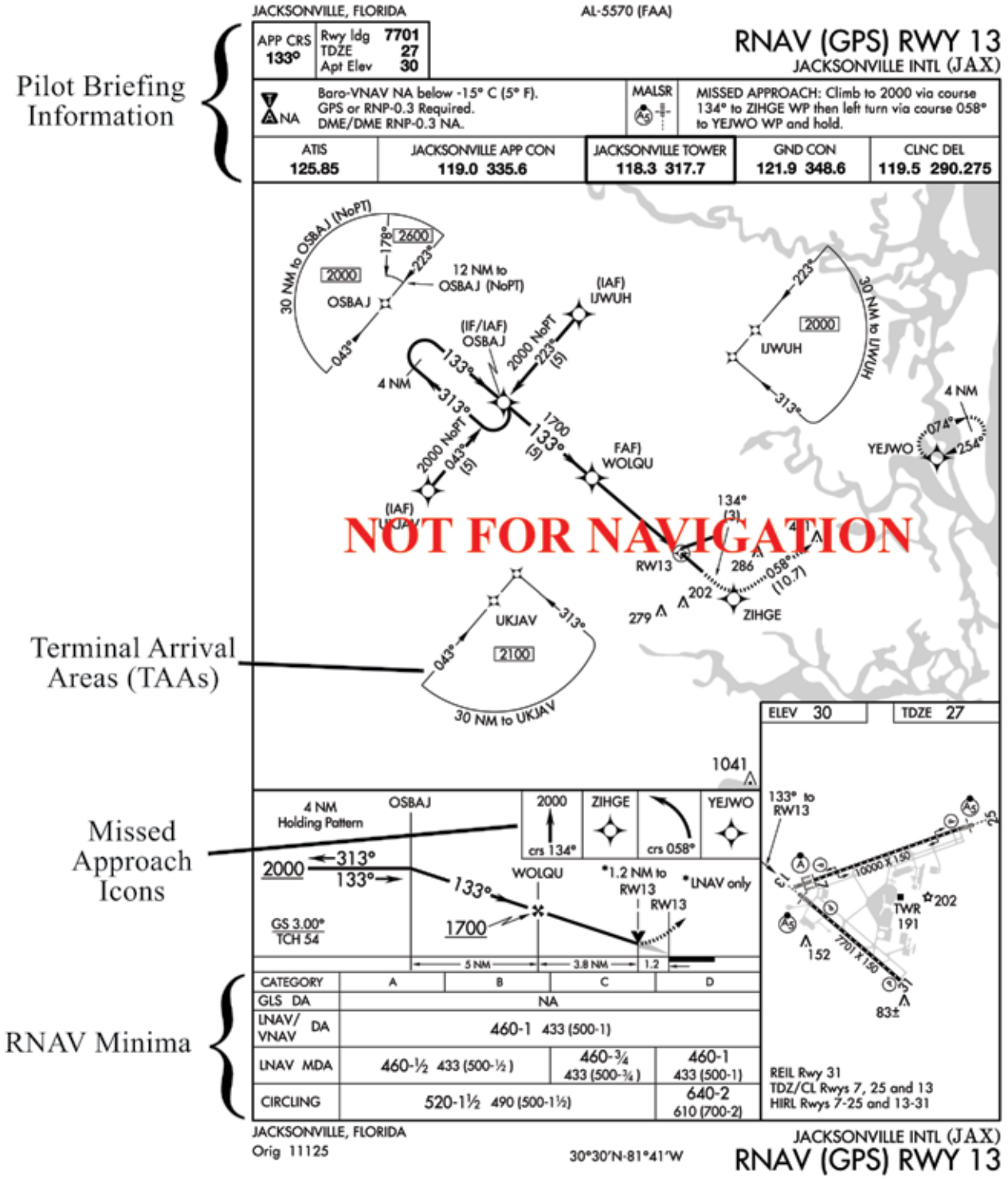
2. DME/DME based RNP-0.3 systems may be used only when a chart note indicates DME/DME availability; e.g., “DME/DME RNP-0.3 Authorized.” Specific DME facilities may be required; e.g., “DME/DME RNP-0.3 Authorized, ABC, XYZ required.”

TERMINAL ARRIVAL AREAS (TAAs)

The objective of the Terminal Arrival Area (TAA) is to provide a seamless transition from the enroute structure to the terminal environment for arriving aircraft equipped with Flight Management System (FMS) and/or Global Positioning System (GPS) navigational equipment. The underlying instrument approach procedure is an area navigation (RNAV) procedure. The TAA contains within it a “T” structure that normally provides for a No Procedure Turn (NoPT) for aircraft using the approach. The TAA provides the pilot and air traffic controller with a very efficient method for routing traffic into the terminal environment with little required air traffic control interface, and with minimum altitudes depicted that provide standard obstacle clearance compatible with the instrument procedure associated with it. The TAA will not be found on all RNAV procedures, particularly in areas of heavy concentration of air traffic. When the TAA is published, it replaces the MSA for that approach procedure. TAAs may appear on current and new format GPS and RNAV IAP charts.

NOTE: Additional information for the TAAs can be found in the Aeronautical Information Manual (AIM) Para 5-4-5-d.

Instrument Approach Chart Format

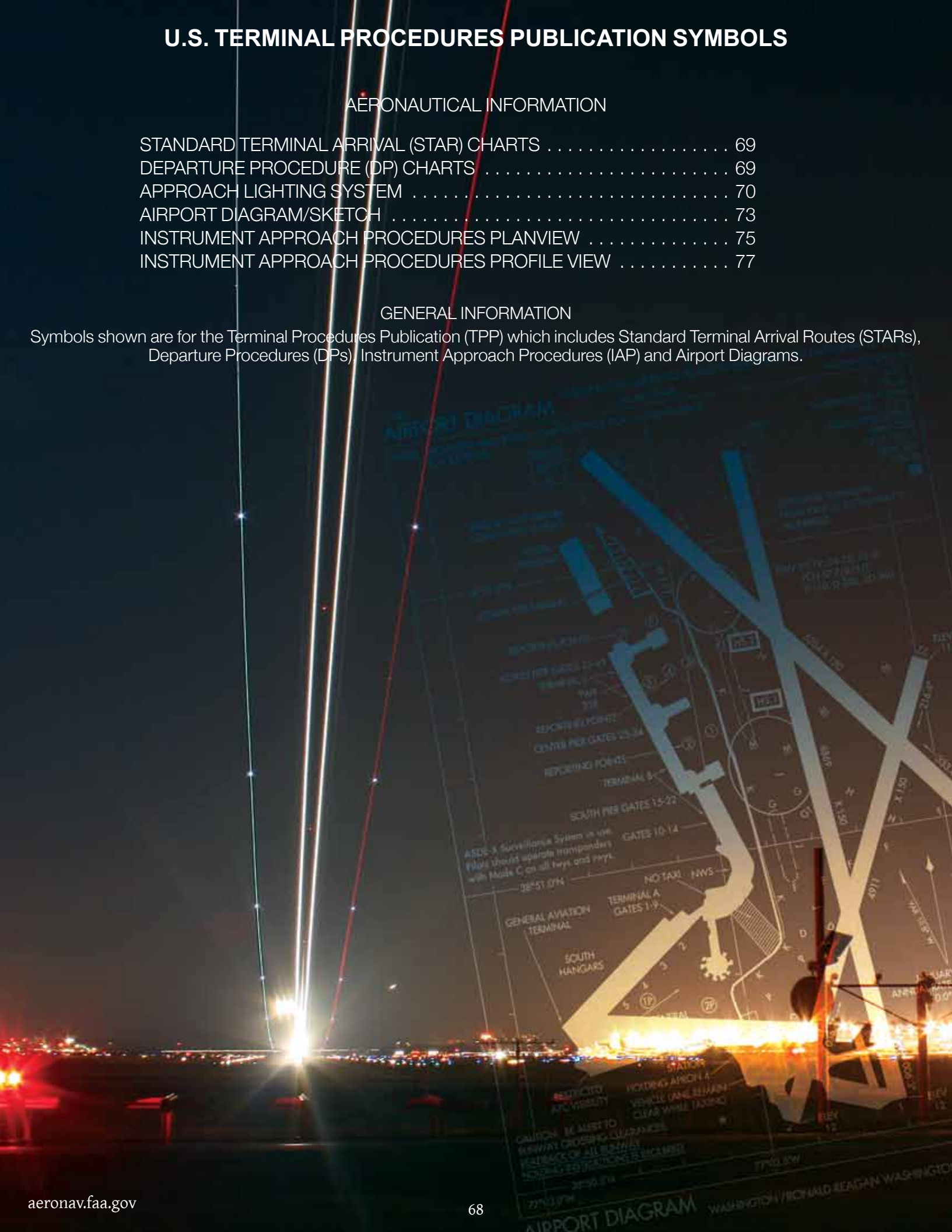


U.S. TERMINAL PROCEDURES PUBLICATION SYMBOLS

AERONAUTICAL INFORMATION

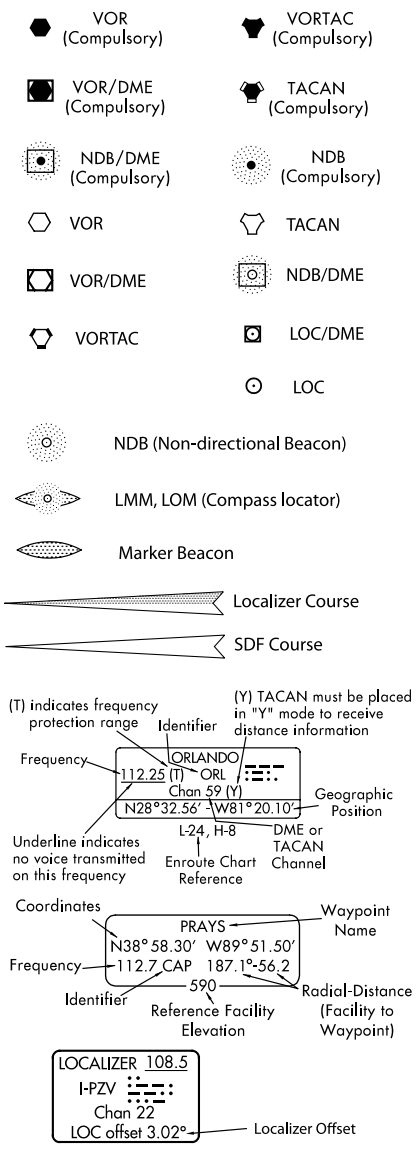
GENERAL INFORMATION

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

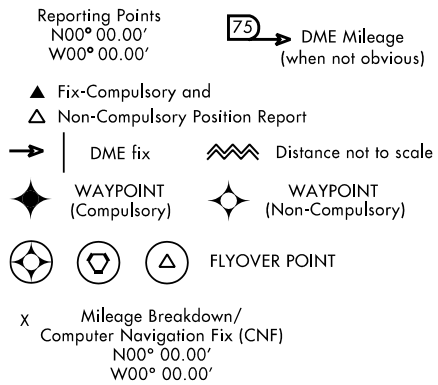


STANDARD TERMINAL ARRIVAL (STAR) CHARTS
DEPARTURE PROCEDURE (DP) CHARTS

RADIO AIDS TO NAVIGATION

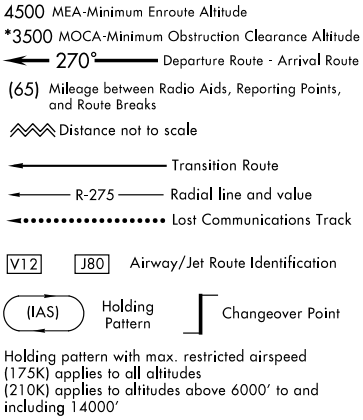


FIXES/ATC REPORTING REQUIREMENTS

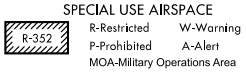


STANDARD TERMINAL ARRIVAL (STAR) CHARTS
DEPARTURE PROCEDURE (DP) CHARTS

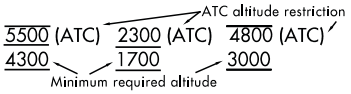
ROUTES



SPECIAL USE AIRSPACE

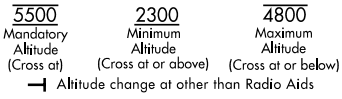


CROSSING ALTITUDES



INDICATED AIR SPEED

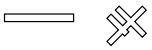
ALTITUDES



AIRPORTS

STAR CHARTS

DP CHARTS

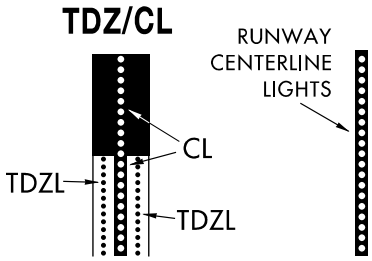


NOTES

All mileages are nautical.
★ Indicates a non-continuously operating facility, see A/FD or flight supplement.
All radials, bearings are magnetic.
All altitudes/elevations are in feet-MSL.
MRA- Minimum Reception Altitude.
MAA- Maximum Authorized Altitude.
(NAME2.NAME) - Example of DP flight plan Computer Code.
(NAME.NAME2) - Example of STAR flight plan Computer Code.
SL-0000 (FAA) - Example of a chart reference number.
▼ Take-Off Minimums not standard and/or Departure Procedures are published.

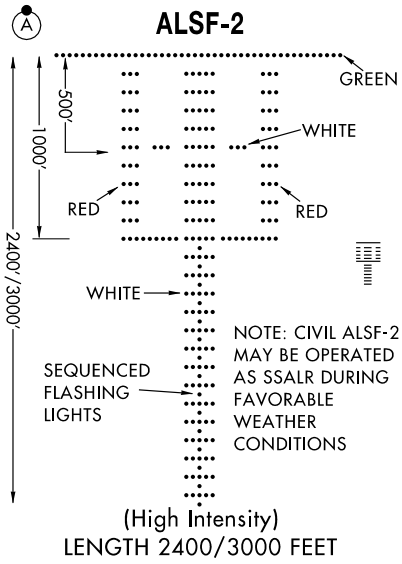
APPROACH LIGHTING SYSTEM

RUNWAY TOUCHDOWN ZONE AND CENTERLINE LIGHTING SYSTEMS



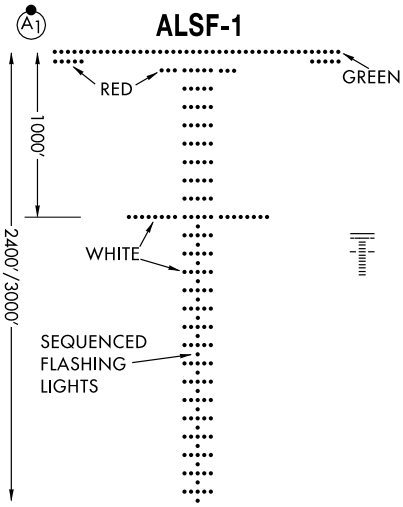
APPROACH LIGHTING SYSTEM

ALSF-2



(High Intensity)
LENGTH 2400/3000 FEET

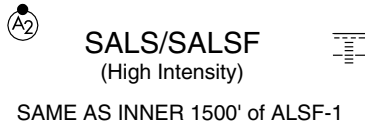
ALSF-1



(High Intensity)
LENGTH 2400/3000 FEET

APPROACH LIGHTING SYSTEM

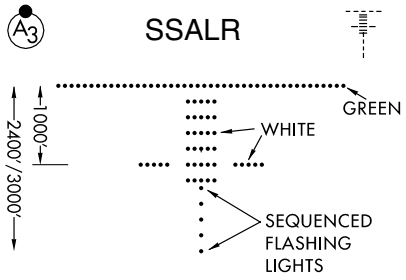
SHORT APPROACH LIGHTING SYSTEM



SAME AS INNER 1500' of ALSF-1

SIMPLIFIED SHORT APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS

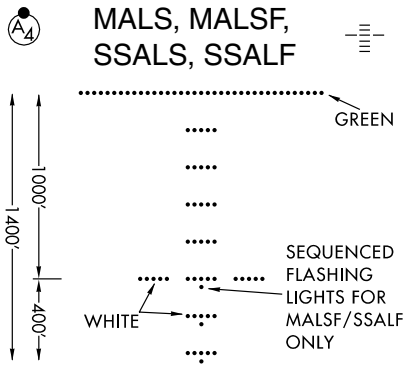
SSALR



(High Intensity)
LENGTH 2400/3000 FEET

MEDIUM INTENSITY (MALS AND MALSF) OR SIMPLIFIED SHORT (SSALS AND SSALF) APPROACH LIGHTING SYSTEMS

MALS
MALSF
SSALS
SSALF



LENGTH 1400 FEET

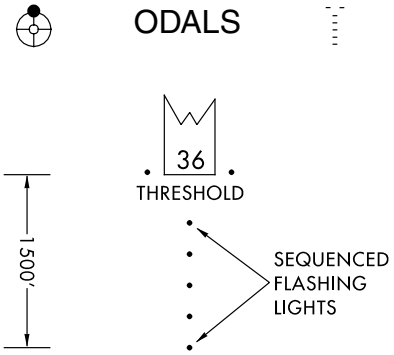
MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS

MALSR

SAME LIGHT CONFIGURATION AS SSALR.

OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM

ODALS



LENGTH 1500 FEET

APPROACH LIGHTING SYSTEM

VISUAL APPROACH SLOPE INDICATOR

VASI

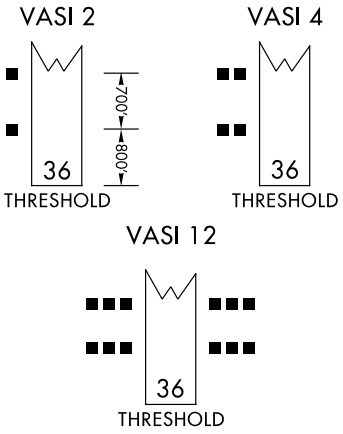
Ⓥ VASI

VISUAL APPROACH SLOPE INDICATOR WITH STANDARD THRESHOLD CLEARANCE PROVIDED.

ALL LIGHTS WHITE ——— TOO HIGH

FAR LIGHTS RED
NEAR LIGHTS WHITE] ON GLIDE SLOPE

ALL LIGHTS RED ——— TOO LOW

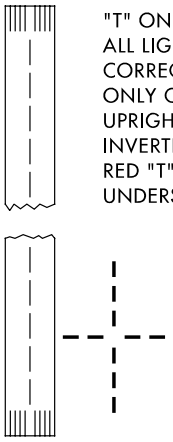


"T" - VISUAL APROACH SLOPE INDICATOR

"T"-VASI

Ⓥ1 "T"-VASI

"T" ON BOTH SIDES OF RWY
ALL LIGHTS VARIABLE WHITE.
CORRECT APPROACH SLOPE-
ONLY CROSS BAR VISIBLE.
UPRIGHT "T"- FLY UP.
INVERTED "T"- FLY DOWN.
RED "T"- GROSS
UNDERSHOOT.



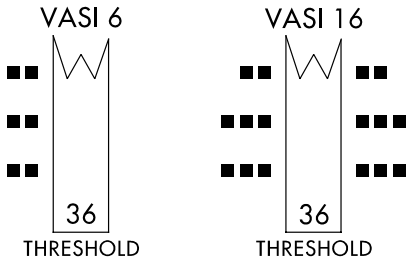
APPROACH LIGHTING SYSTEM

VISUAL APPROACH SLOPE INDICATOR

VASI

VASI

Ⓥ3 VISUAL APPROACH SLOPE INDICATOR WITH A THRESHOLD CROSSING HEIGHT TO ACCOMODATE LONG BODIED OR JUMBO AIRCRAFT.

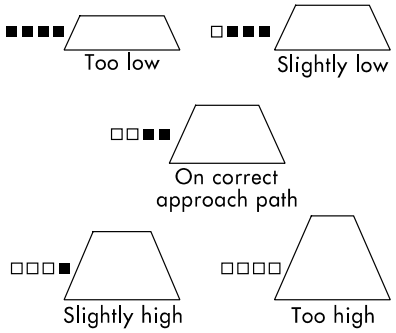


PRECISION APPROACH PATH INDICATOR

PAPI

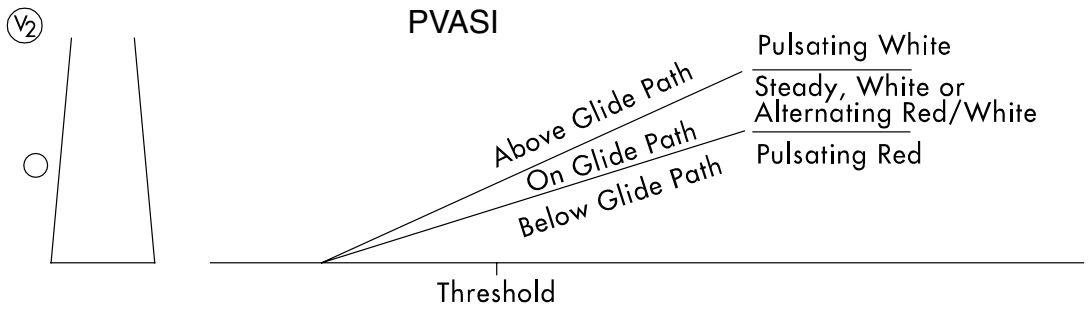
PAPI

Ⓟ Legend: □ White ■ Red



PULSATING VISUAL APPROACH SLOPE INDICATOR

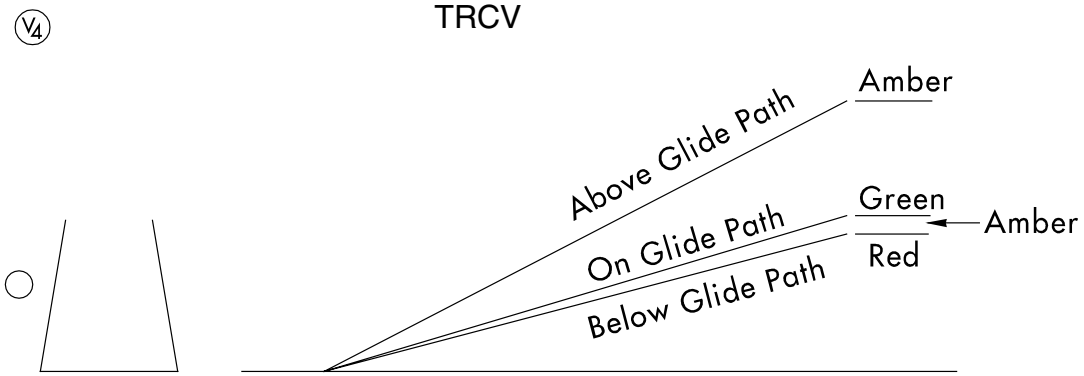
PVASI



CAUTION: When viewing the pulsating visual approach slope indicators in the pulsating white or pulsating red sectors, it is possible to mistake this lighting aid for another aircraft or a ground vehicle. Pilots should exercise caution when using this type of system.

TRI-COLOR VISUAL APPROACH SLOPE INDICATOR

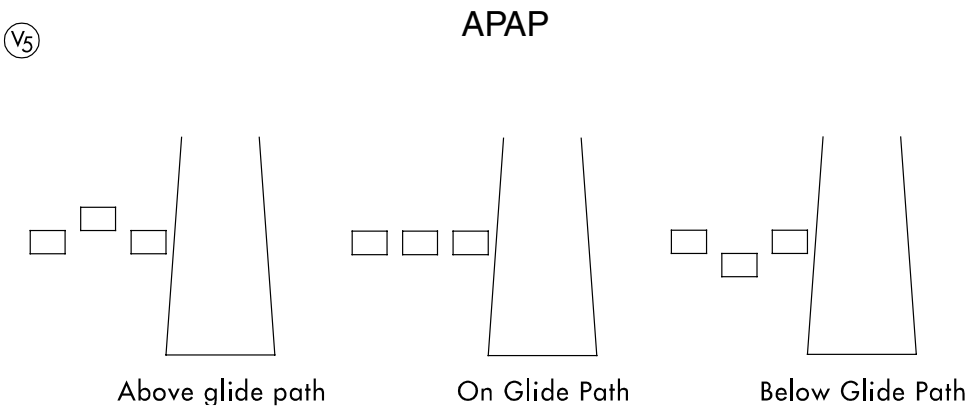
TRCV



CAUTION: When the aircraft descends from green to red, the pilot may see a dark amber color during the transition from green to red.

ALIGNMENT OF ELEMENT SYSTEMS

APAP



Painted panels which may be lighted at night. To use the system the pilot positions the aircraft so the elements are in alignment.

AIRPORT DIAGRAM/SKETCH

ARRESTING GEAR

- uni-directional
- bi-directional
- Jet Barrier
- Arresting System

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

REFERENCE FEATURES

- Buildings
- Tanks
- Obstruction
- Highest Obstruction
- Airport Beacon
- Runway Radar Reflectors
- Hot Spot
- TWR Control Tower #

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

Helicopter Alighting Areas

Negative Symbols used to identify Copter Procedures landing point

Runway Threshold elevation...THRE 123
Runway TDZ elevation.....TDZE 123

0.3% DOWN
0.8% UP
Runway Slope

(shown when runway slope equals or exceeds 0.3%)

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

A D symbol is shown to indicate runway declared distance information available, see appropriate A/FD, Alaska or Pacific Supplement for distance information.

AIRPORT DIAGRAM/SKETCH

NOTES

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

Approach light symbols are shown in the Flight Information Handbook.

Airport diagram scales are variable.

True/magnetic North orientation may vary from diagram to diagram

Coordinate values are shown in 1 or ½ minute increments. They are further broken down into 6 second ticks, within each 1 minute increments.

Positional accuracy within ±600 feet unless otherwise noted on the chart.

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

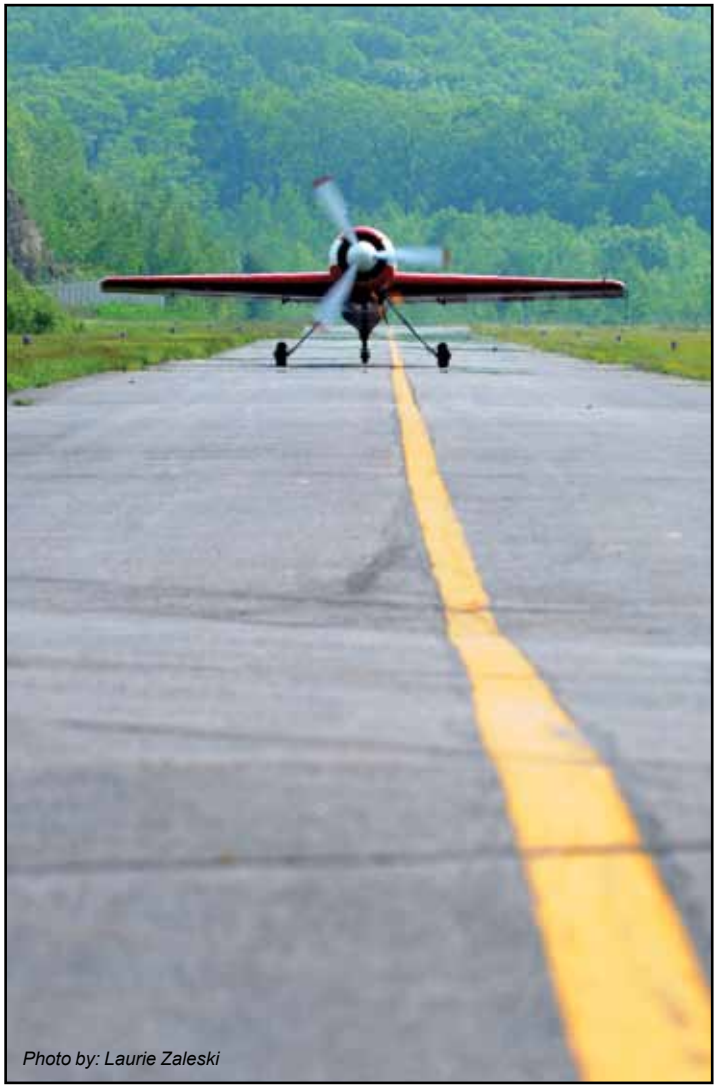


Photo by: Laurie Zaleski

AIRPORT DIAGRAM/SKETCH

RUNWAYS

Hard Surface

Other than hard surface

Stopways, Taxiways, Parking Areas

Displaced Threshold

Closed Runway

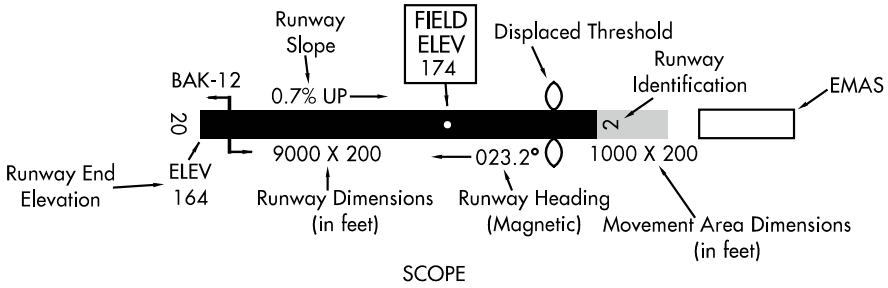
Closed Taxiway

Under Construction

Metal Surface

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

Runway Weight Bearing Capacity/or PCN Pavement Classification Number is shown as a codified expression.
Refer to the appropriate Supplement/Directory for applicable codes e.g.,
RWY 14-32 PCN 80 F/D/X/U S-75, D-185, 2S-175, 2D-325



SCOPE

Airport diagrams are specifically designed to assist in the movement of ground traffic at locations with complex runway/taxiway configurations and provide information for updating Computer Based Navigation Systems (I.E., INS, GPS) aboard aircraft. Airport diagrams are not intended to be used for approach and landing or departure operations. For revisions to Airport Diagrams: Consult FAA Order 7910.4.

INSTRUMENT APPROACH PROCEDURES PLANVIEW

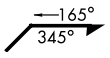
TERMINAL ROUTES

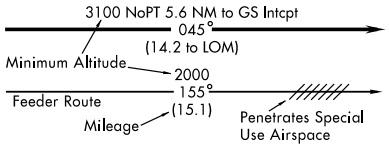
Procedure Track

Missed Approached

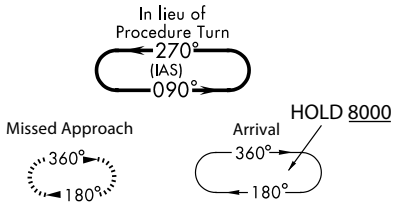
Visual Flight Path

Procedure Turn (Type degree and point of turn optional)





HOLDING PATTERNS



Limits will only be specified when they deviate from the standard.
Holding pattern with max. restricted airspeed:
(175K) applies to all altitudes.
(210K) applies to altitudes above 6000' to and including 14000'
DME fixes may be shown.
Arrival Holding Pattern altitude restrictions will be indicated when they deviate from the adjacent leg.

FIXES/ATC REPORTING REQUIREMENTS

Reporting Point

▲ Name (Compulsory)

△ Name (Non-Compulsory)

WAYPOINT (Compulsory)

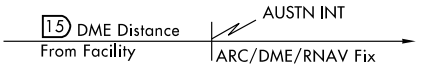
WAYPOINT (Non-Compulsory)

FLYOVER POINT

Intersection

MAP WP (Flyover)

Computer Navigation Fix (CNF)
x (NAME) ("x" omitted when it conflicts with runway pattern)



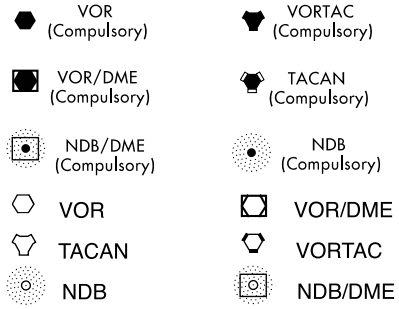
R-198 Radial line and value

LR-198 Lead Radial

LB-198 Lead Bearing

INSTRUMENT APPROACH PROCEDURES PLANVIEW

RADIO AIDS TO NAVIGATIONS



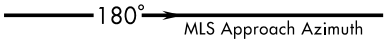
LOM/LMM (Compass locator at Outer/Middle Marker)

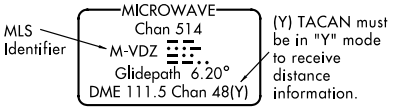
Marker Beacon

Localizer (LOC/LDA) Course

Right side shading-Front Course; Left side shading-Back Course

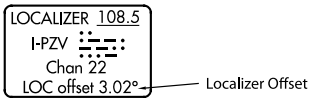
SDF Course

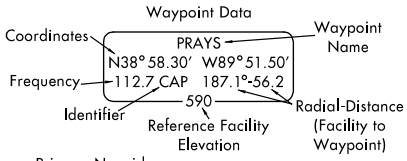




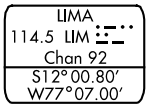
LOC/DME

⊙ LOC/LDA/SDF/MLS Transmitter
(shown when installation is offset from its normal position off the end of the runway.)

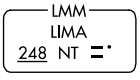




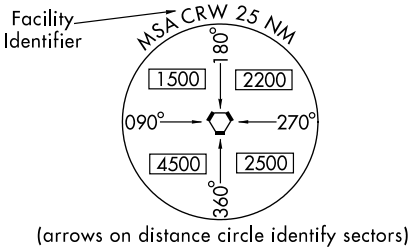
Primary Navaid with Coordinate Values



Secondary Navaid



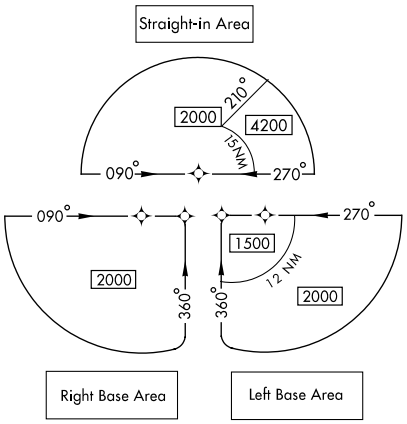
MINIMUM SAFE ALTITUDE



(arrows on distance circle identify sectors)

INSTRUMENT APPROACH PROCEDURES PLANVIEW

TERMINAL ARRIVAL AREAS



Minimum MSL altitudes are charted within each of these defined areas/subdivisions that provide at least 1,000 feet of obstacle clearance, or more as necessary in mountainous areas.

SPECIAL USE AIRSPACE

R-Restricted W-Warning
P-Prohibited A-Alert
MOA-Military Operations Area

OBSTACLES

- Spot Elevation
- Highest Spot Elevation
- Obstacle
- Highest Obstacle
- ± Doubtful accuracy

FACILITIES/FIXES

FM
IM
MM
NDB
OM
VOR
VORTAC
TACAN
WP

FIX
INT

ALTITUDES

5500 — Mandatory Altitude (Cross at)

2300 — Minimum Altitude (Cross at or above)

4800 — Maximum Altitude (Cross at or below)

2200 — Recommended Altitude

5000 / 3000 — Mandatory Block Altitude

MCA (Minimum Crossing Altitude)

INSTRUMENT APPROACH PROCEDURES PLANVIEW

MISCELLANEOUS

VOR Changeover Point

RWY 15 S12°00.52' W77°06.91' — End of Rwy Coordinates (DOD only)

Distance not to scale

International Boundary

Final Approach Fix (FAF) (for non-precision approaches)

2400 — Glide Slope/Glide Path Intercept Altitude and final approach fix for vertically guided approach procedures.

Visual Descent Point (VDP)

Visual Flight Path

Miscellaneous Symbols

Miscellaneous Symbols are occasionally used as a reference mark to connect information from two different areas on a chart.

† * # ** ## % ††

AIRPORTS

Primary and Secondary (named in planview)

Seaplane Base

INDICATED AIRSPEED

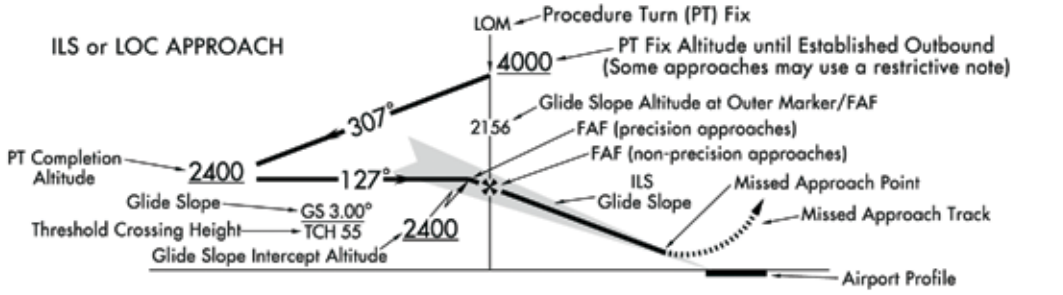
INDICATED AIRSPEED

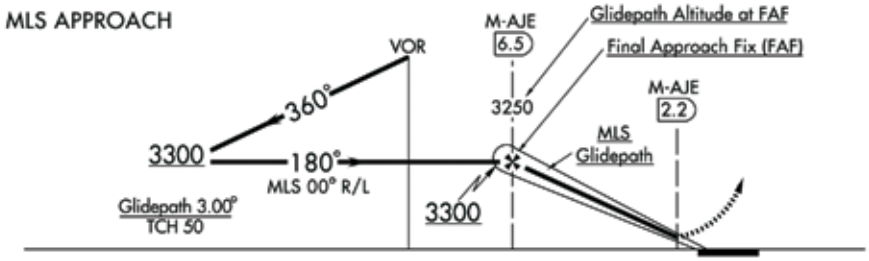
175K	120K	250K	180K
Mandatory Airspeed	Minimum Airspeed	Maximum Airspeed	Recommended Airspeed

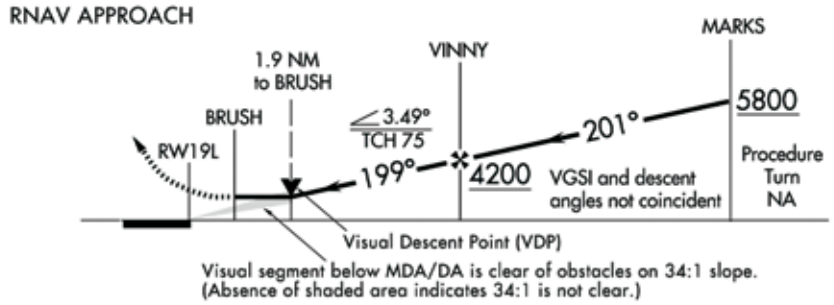
PROFILE VIEW

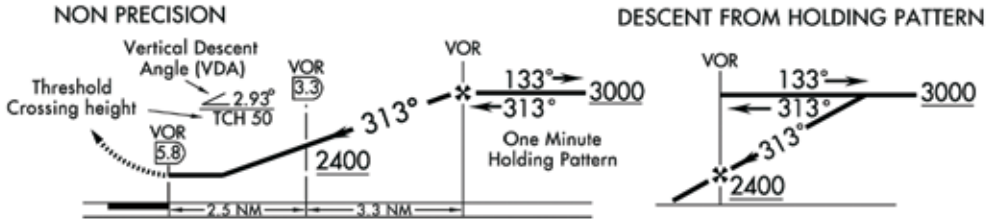
Two different methods are used for vertical guidance:
a. "GS" indicates an electronic glide slope or barometric vertical guidance is present. In the case of an Instrument Landing System (ILS) and Wide Area Augmentation System (WAAS) LPV approach procedures, an electronic signal provides vertical guidance. Barometric vertical guidance is provided for RNP and LNAV/VNAV instrument approach procedures. All ILS, LPV, RNP, and LNAV/VNAV will be in this format GS 3.00°/TCH 55, located in the lower left or right corner.

b. Other charts without electronic or barometric vertical guidance will be in this format ∠3.00°/TCH 55, indicating a non-precision vertical descent angle to assist in preventing controlled flight into terrain. On Civil (FAA) procedures, this information is placed above or below the procedure track following the fix it is based on.









ALTITUDES

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

PROFILE SYMBOLS

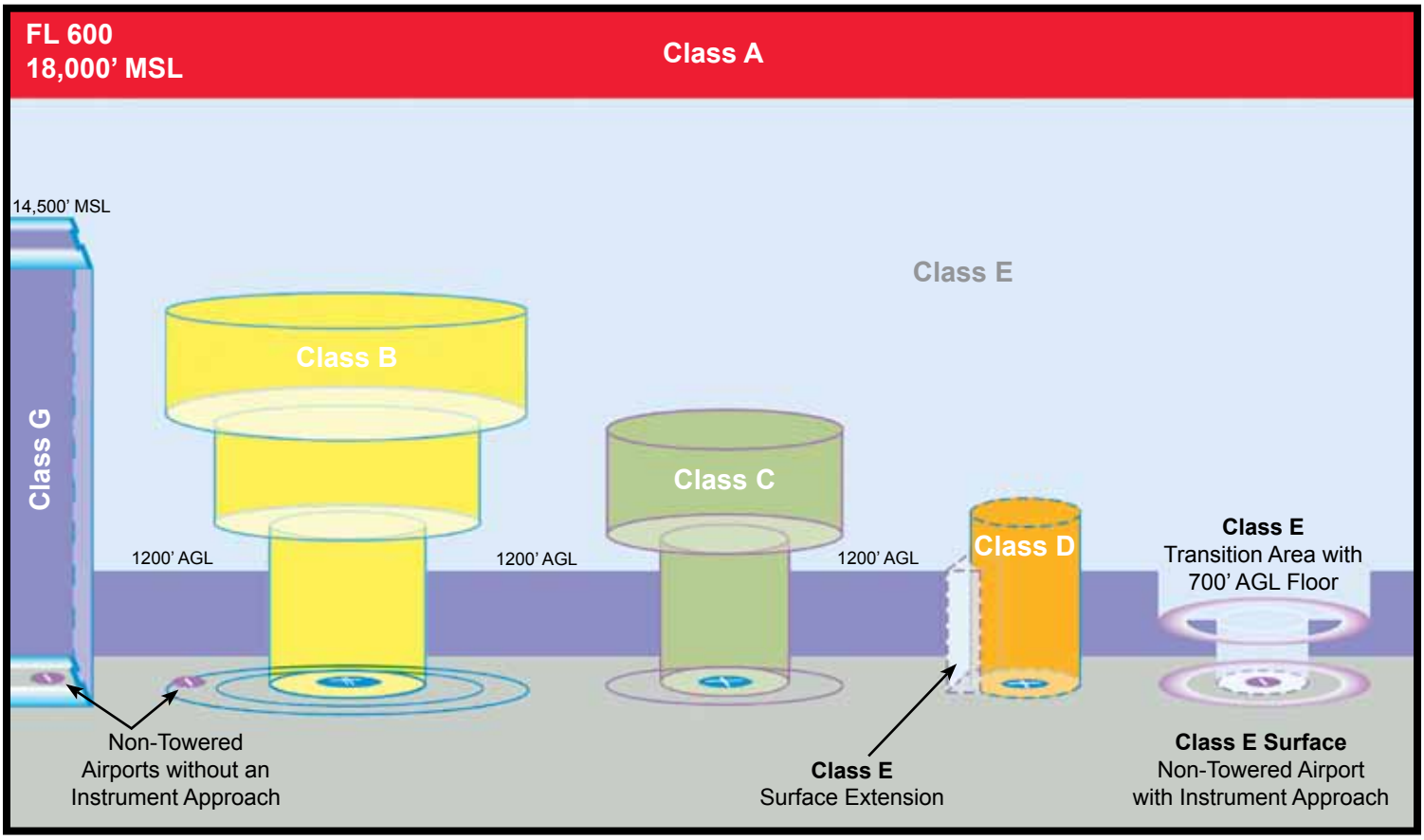
2400 Glide Slope/Glide Path Intercept Altitude and final approach fix for vertically guided approach procedures.
Visual Descent Point (VDP)
Visual Flight Path
Note: Facilities and waypoints are depicted as a solid vertical line while fixes and intersections are depicted as a dashed vertical line.

AIRSPACE CLASSES

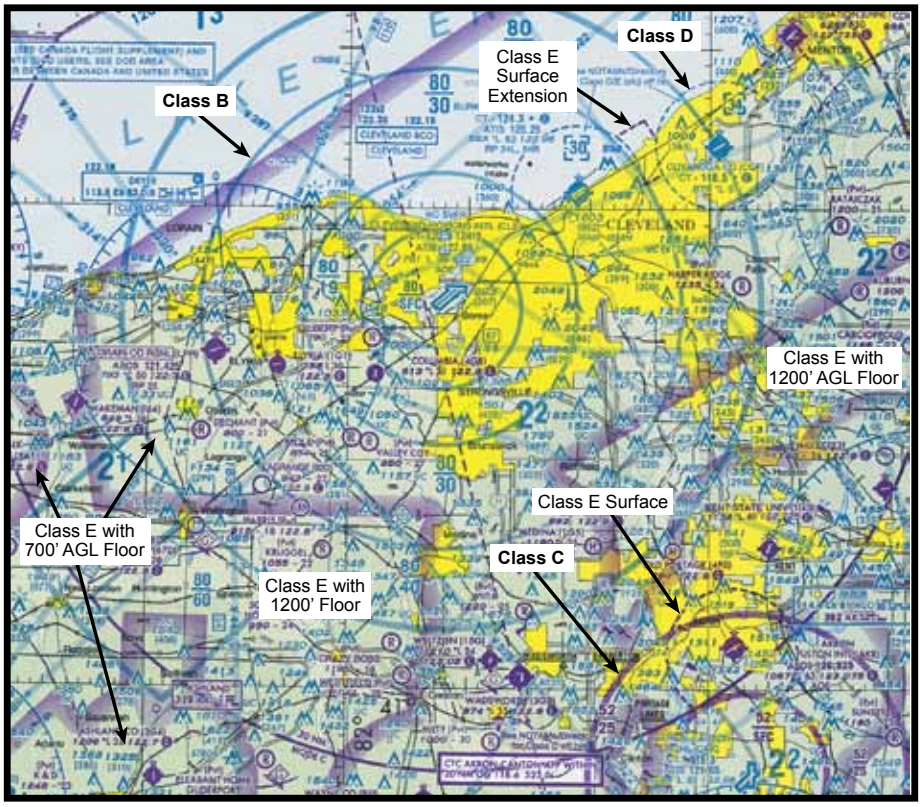
AIRSPACE	CLASS A	CLASS B	CLASS C	CLASS D	CLASS E	CLASS G
Entry Requirements	ATC clearance	ATC clearance	ATC clearance for IFR All require radio contact	ATC clearance for IFR All require radio contact	ATC clearance for IFR All IFR require radio contact	None
Minimum Pilot Qualifications	Instrument Rating	Private or Student certification. Local restrictions apply.	Student certificate	Student certificate	Student certificate	Student certificate
Two-Way Radio Communications	Yes	Yes	Yes	Yes	Yes, under IFR flight plan*	Not required*
Special VFR Allowed	No	Yes	Yes	Yes	Yes	N/A
VFR Visibility Minimum	N/A	3 statute miles	3 statute miles	3 statute miles	**Below 10,000' MSL** 3 statute miles **At or above 10,000' MSL** 5 statute miles	**Below 1200' AGL (regardless of MSL)** Day 1 statute mile Night 3 statute miles **Above 1200' AGL & below 10,000' MSL** Day 1 statute mile Night 3 statute miles **Above 1200' AGL & at or Above 10,000' MSL** 5 statute miles
VFR Minimum Distance From Clouds	N/A	Clear of Clouds	500' below 1000' above 2000' horizontally	500' below 1000' above 2000' horizontally	**Below 10,000' MSL** 500' below 1000' above 2000' horizontally **At or above 10,000' MSL** 1000' below 1000' above 1 mile horizontally	**Below 1200' AGL (regardless of MSL)** **Day** Clear of Clouds **Night** 500' below 1000' above 2000' horizontally **Above 1200' AGL & below 10,000' MSL** **Day** 500' below 1000' above 2000' horizontally **Night** 500' below 1000' above 2000' horizontally **Above 1200' AGL & at or above 10,000' MSL** 1000' below 1000' above 1 mile horizontally
VFR Aircraft Separation	N/A	All	IFR Aircraft	Runway Operations	None	None
Traffic Advisories	Yes	Yes	Yes	Workload permitting	Workload permitting	Workload permitting
Airport Application	N/A	Radar Instrument Approaches Weather Control Tower High Density	Radar Instrument Approaches Weather Control Tower	Instrument Approaches Weather Control Tower	Instrument Approaches Weather	Control Tower
Speed Restrictions	N/A	250 KIAS below 10000' MSL	250 KIAS below 10,000' MSL and 200 KIAS below 2500' AGL within 4nm of the primary airport	250 KIAS below 10,000' MSL and 200 KIAS below 2500' AGL within 4nm of the primary airport	N/A	N/A
Differs from ICAO	No	ICAO does not have speed restriction	ICAO does not have speed restriction ICAO requires ATC clearance	ICAO requires ATC clearance	No	ICAO requires 3 statute miles visibility

* Unless a temporary tower is present

AIRSPACE CLASSIFICATION



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



Excerpt from Detroit Sectional Chart

aeronav.faa.gov

FAA Product ID: USRGD

NSN 7641015114157

ED NO. 011

NGA REF. NO. FAAIMAEROGUIDE

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