



**Federal Aviation
Administration**

Aeronautical Information Services

Aeronautical Chart Users' Guide

Effective as of 5 September 2024

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INTRODUCTION

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

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

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

Paper copies of the charts are available through an FAA Approved Print Provider. A complete list of current providers is available at http://www.faa.gov/air_traffic/flight_info/aeronav/print_providers/.

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

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

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

KEEP YOUR CHARTS CURRENT

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

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

EFFECTIVE DATE OF CHART USERS' GUIDE AND UPDATES

All information in this guide is effective as of **5 September 2024**. All graphics used in this guide are for educational purposes. Chart symbology may not be to scale. Please do not use them for flight navigation.

The Chart Users' Guide is published in accordance with the 56-day aeronautical chart product schedule.

COLOR VARIATION

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

REPORTING CHART DISCREPANCIES

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

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

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Aeronautical Inquiries: https://www.faa.gov/air_traffic/flight_info/aeronav/aero_data/Aeronautical_Inquiries/

WHAT'S NEW?

Update as of 5 September 2024

The following charting items have been added to the Chart Users' Guide since the Guide was last published on 11 July 2024:

VFR CHARTS

No Significant Changes Applied

IFR ENROUTE CHARTS

No Significant Changes Applied

TERMINAL PROCEDURE PUBLICATION (TPP)

A change has been processed to the Interagency Air Committee charting specifications to differentiate Stopways, Overruns, and Blast Pads from Taxiways and Parking Areas on the Airport Diagram. While Airport movement areas indicate Stopway, Overrun, and Blast Pads by painting chevron symbols on the pavement, the dimensions of the areas identified are not consistently databased and are depicted using the same gray pavement symbology as Taxiways and Parking Areas leading to pilot confusion. As a result, it was decided to replace the Stopway, Overrun, and Blast Pad symbology on the Airport Diagram with chevron symbology and remove the numerical dimensions. This topic was discussed at the Aeronautical Charting Meeting ([22-02-375](#)).

Interagency Air Committee charting specifications for airport diagrams do not provide for the ability to indicate when Ramp Control frequencies are part-time. Frequencies for TOWER, ATIS, and AFIS are annotated with a star after the communication title to indicate that they are part-time and that the Chart Supplement should be consulted for additional information such as hours of operation. As a result, Ramp Control should be included to allow for the use of the star when the frequencies are part-time, and additional information is provided in the Chart Supplement.

EXPLANATION OF VFR TERMS AND SYMBOLS

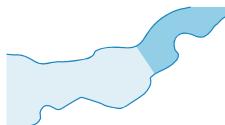
This chapter covers the Sectional Aeronautical Chart (Sectional). These charts include the most current data at a scale of (1:500,000), which is large enough to be read easily by pilots flying by sight under Visual Flight Rules. Sectionals are named after a major city within its area of coverage.

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

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

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

WATER FEATURES (HYDROGRAPHY)



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

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

LAND FEATURES (TERRAIN) AND OBSTRUCTIONS

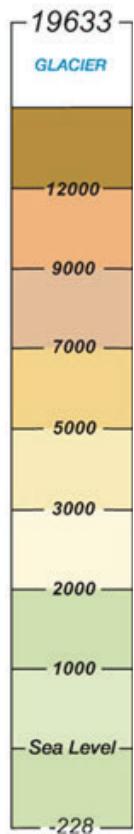
The elevation and configuration of the Earth's surface is important to pilots. Our Aeronautical Information Specialists are devoted to showing the contour of the earth and any obstructions clearly and accurately on our charts. We use five different techniques: contour lines, shaded relief, color tints,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

1. Contour lines join points of equal elevation. On Sectionals, basic contours are spaced at 500' intervals. Intermediate contours are typically at 250' intervals in moderately level or gently rolling areas. Auxiliary contours at 50', 100', 125', or 150' intervals occasionally show smaller relief features in areas of relatively low relief. The pattern of these lines and their spacing gives the pilot a visual concept of the terrain. Widely spaced contours represent gentle slopes, while closely spaced contours represent steep slopes.
2. Shaded relief shows how terrain may appear from the air. Shadows are shown as if light is coming from the northwest, because studies have shown that our visual perception has been conditioned to this view.

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

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

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



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

In this example the
MEF represents
12,500'.

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

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

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

MEF - Man-made Obstacle

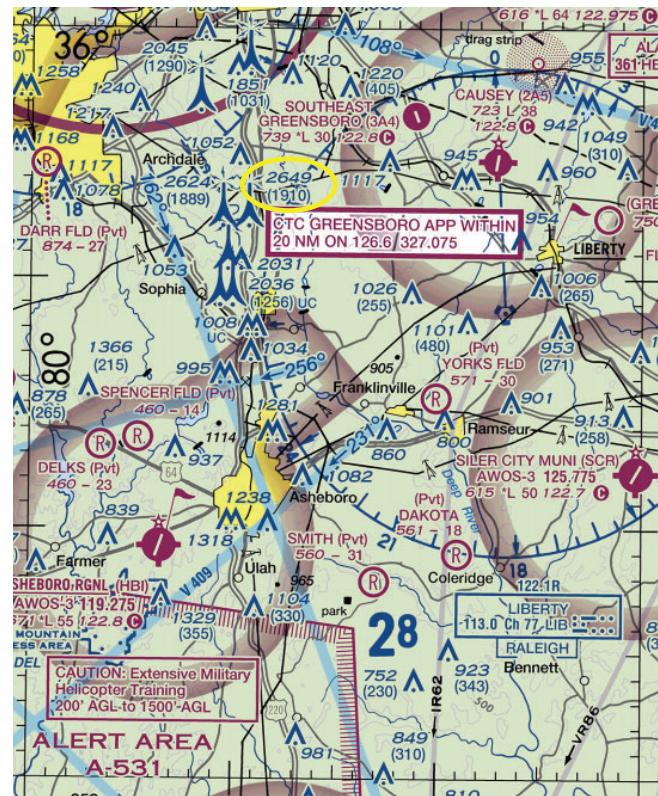
When a man-made obstacle is more than 200' above the highest terrain within the quadrant:

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

Example:

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

28



MEF - Natural Terrain Feature or Natural Vertical Obstacle

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

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

Example:

Elevation of obstacle top (MSL) 13161

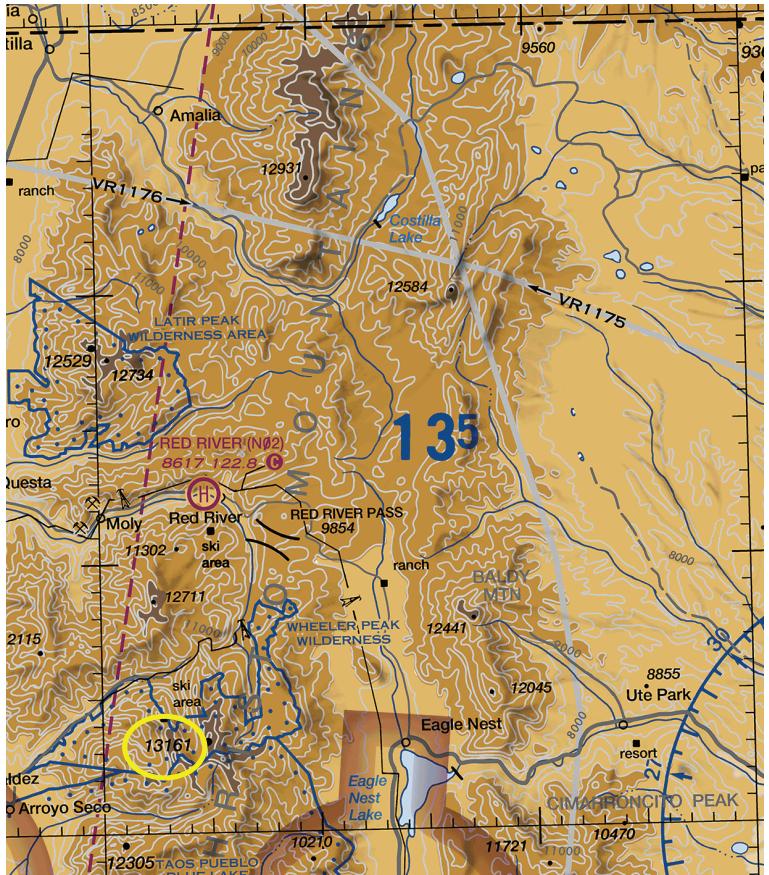
Possible vertical error +100

Obstacle Allowance +200

equals 13461

Raise to the following 100' level 13500

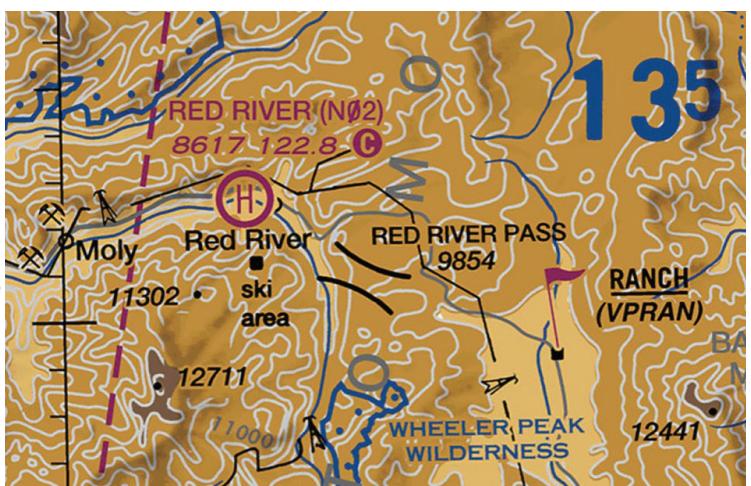
Maximum Elevation Figure (MEF) **135**



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

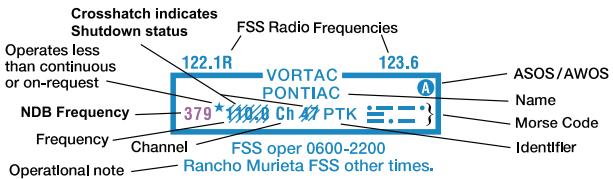
LAND FEATURES - MOUNTAIN PASSES

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



RADIO AIDS TO NAVIGATION

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



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

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

DMEs are shown without the compass rose.

AIRPORTS

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



Hard-surfaced runways greater than 8069' or some multiple runways less than 8069'



Hard-surfaced runways 1500' to 8069'



Other than hard-surfaced runways



Seaplane bases

Military airports:



Other than hard-surfaced runways

Foreign airports:



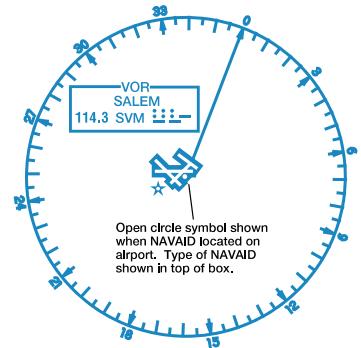
Hard-surfaced runways are depicted the same as public-use airports.

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

Fuel Available:



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



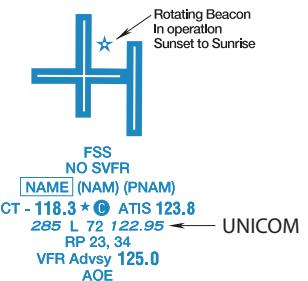
Other airports with or without fuel:



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

Airports are identified by their official FAA designated name.

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



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

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

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

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

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

AIRSPACE

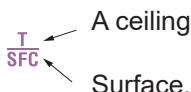
CONTROLLED AIRSPACE

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

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

Class B Airspace is shown on the Sectional Aeronautical Chart (Sectional) and Terminal Area Chart (TAC). *Class B MSL Altitudes* **90 20** The MSL ceiling and floor altitudes of each sector are shown in solid blue figures with the last two zeros omitted. Floors extending "upward from above" a certain altitude are preceded by a (+). Operations at and below these altitudes are outside of Class B Airspace. Radials and arcs used to define Class B are prominently shown on TACs. Detailed rules and requirements associated with the particular Class B are shown. The name by which the Class B is shown as **LAS VEGAS CLASS B** for example.

Class C Airspace is shown on Sectionals and TACs. The MSL ceiling and floor altitudes of each sector are *Class C MSL Altitudes* **70 15** shown in solid magenta figures with the last two zeros eliminated.

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

T Surface.

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

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

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

**CTC BURBANK APP WITHIN
20 NM ON 124.6 395.9**

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

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

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

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

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

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

2400 AGL
4500 MSL

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

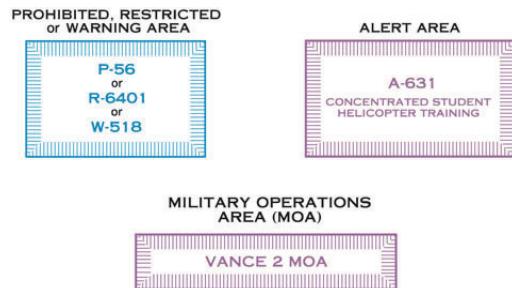
CLASS G	Class E Airspace with floor 700 ft. above surface that laterally abuts Class G Airspace.
	Class E Airspace with floor 700 ft. above surface that laterally abuts 1200 ft. or higher Class E Airspace
	Class E Airspace with floor 1200 ft. or greater above surface that laterally abuts Class G Airspace

UNCONTROLLED AIRSPACE

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

SPECIAL USE AIRSPACE

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



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

OTHER AIRSPACE AREAS

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

MODE C & ADS-B OUT
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 under Federal Aviation Regulation 93 (FAR 93), (Special Air Traffic Rules and Airport Traffic Patterns), are shown by "boxing" the airport name.



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

TRUCKEE - TAHOE

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

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

Temporary Flight Restriction (TFR) Areas Relating to National Security are indicated with a broken blue line

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

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

National Defense Airspace Temporary Flight Restriction (TFR) Areas are bounded with cross hatching:

 These areas include airspace that is subject to routine TFRs published as NOTAMs that have a 12+ month duration.

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

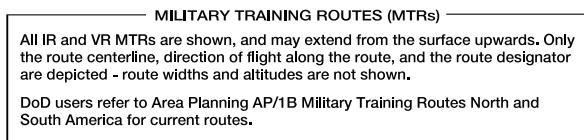
The outer limit of the entire Terminal Radar Service Areas (TRSA) is a continuous screened black line. The various sectors within the TRSA are symbolized by narrower screened black lines.

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

Military Training Routes (MTRs) are shown on Sectionals and TACs. They are identified by the route designator:

 **← 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 Helicopters, Sectionals and TACs except for Hawaiian Islands, which is different.



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

Route identification:

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

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

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

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

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

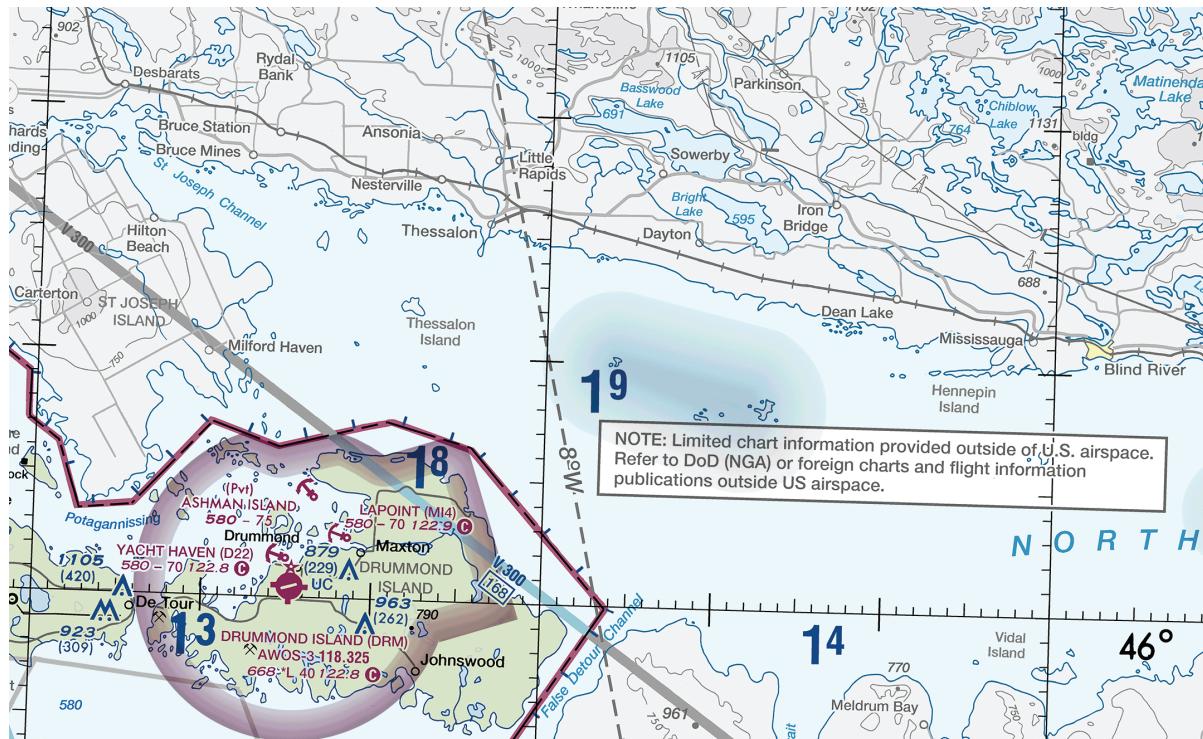
SPECIAL MILITARY ACTIVITY

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



FOREIGN AREAS

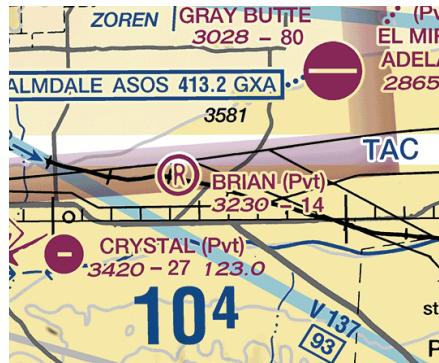
The data depicted in areas outside the U.S. is skeletonized on all VFR aeronautical charts. Only major airports, NAVAIDs, and airways are charted in foreign areas in screened black. Cultural features, hydrographic information and geographic relief are depicted in subdued and different shades of gray.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



TERMINAL AREA CHART (TAC) COVERAGE

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

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



INSET AND SPECIAL CHART COVERAGE

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

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

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

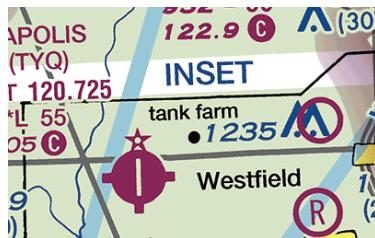


CHART TABULATIONS

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

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

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

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

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

ASR and/or PAR indicate Radar Instrument Approach available.

"MON-FRI" indicates Monday through Friday.

O/T indicates other times.

Frequencies (VHF/UHF)

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

Frequencies (VHF/UHF)

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

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 to ground communications.

Contact nearest FSS for information.

† Other times by NOTAM.

NOTAM - Use of this term in Restricted Areas indicates FAA and DoD NOTAM

systems. Use of this term in all

other Special Use areas indicates the

DoD NOTAM system.

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

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

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

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

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

Sunrise to Sunset

VFR SECTIONAL AND TERMINAL AREA CHARTS

GENERAL INFORMATION

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

AIRPORTS

Landplane: Civil

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

Non-Towered Towered



Ultralight Flight Park

(Selected)



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



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



Landplane: Civil-Military

Non-Towered Towered



Landplane: Landmark Value

Fuel not available



or
Complete information is not available.



Landplane: Military

Refueling and repair facilities not indicated.

Non-Towered Towered



Heliport

(Selected)

Non-Towered Towered



Foreign



Foreign Airport Note

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

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



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

AIRPORTS (Continued)

Seaplane

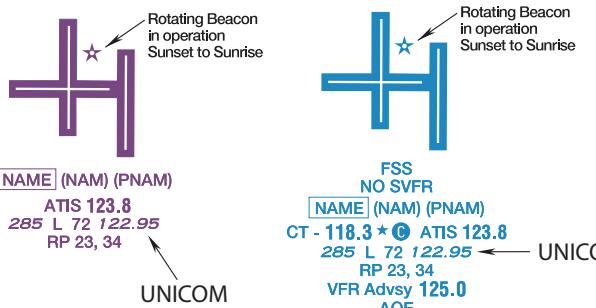


Airport Data Grouping

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

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

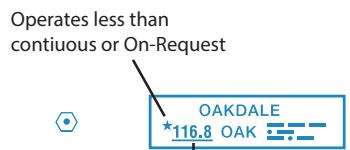
"OBJECTIONABLE": This airport may adversely affect airspace use.



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

RADIO AIDS TO NAVIGATION

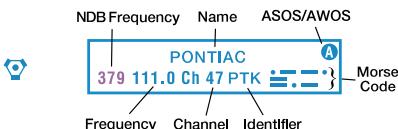
VOR



Underline indicates no voice on this frequency

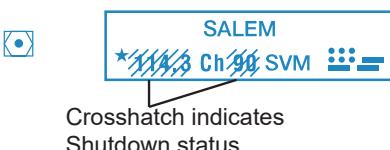
VORTAC

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



Frequency Channel Identifier Morse Code

VOR-DME



Crosshatch indicates Shutdown status

DME

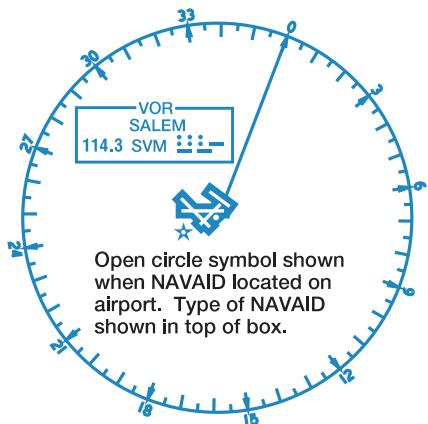


DME co-located at an airport
Note: DMEs are shown without the compass rose.

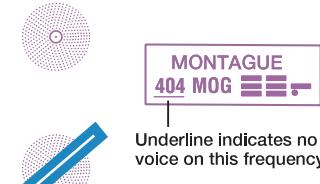


Compass Rose

Compass Rose is "reference" oriented to magnetic north



Non-Directional Radio Beacon (NDB)



Underline indicates no voice on this frequency

NDB-DME



NAVAID Used To Define Class B Airspace ILS Components

ILS-DME



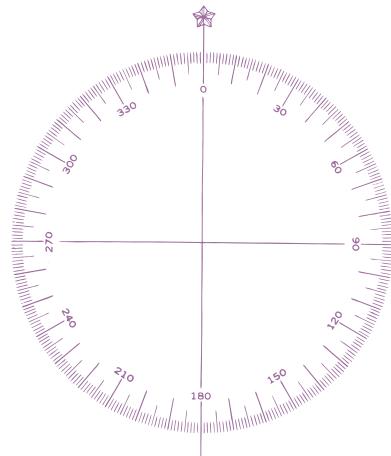
TAC - Shown when used in description of Class B airspace.



Compass Rosette

Shown only in areas void of VOR roses.

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



Example of VOR NAVAID co-located at airport

RADIO AIDS TO NAVIGATION (Continued)

Automated Weather Broadcast Services

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

VHF/UHF LF/MF

A **A**

Flight Service Station (FSS)

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

R - receive only

PONTIAC PTK

No NAVAID of the same name as FSS

OR

122.1R **123.6**

NORTHWAY

116.3 Ch 110 ORT

FSS oper 0600-2200
Rancho Murieta FSS other times

NAVAID same name as FSS but not an RCO

Off Airport AWOS/ASOS

SANDBERG ASOS 120.625 SDB

Broadcast Stations (BS)

KFTM **BS KFTM 1400**

Remote Communications Outlet (RCO)

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

122.525 **123.65**
HANCOCK RCO
GREEN BAY

122.35
ST PAUL
108.6 STP
MINNEAPOLIS

122.35
HUMPHREY
275 HPY
MILES CITY

FSS Radio providing voice communications

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

AIRSPACE INFORMATION

Class B Airspace

Sectional

LAS VEGAS CLASS B



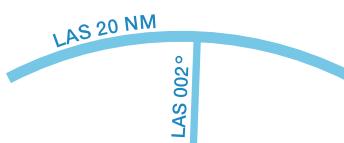
Appropriate notes as required may be shown.

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

(Mode C see FAR 91.215 / AIM)

Terminal Area Chart (TAC)

LAS VEGAS CLASS B



**CTC LAS VEGAS APP
ON 121.1 OR 257.8**

All mileages are nautical (NM).

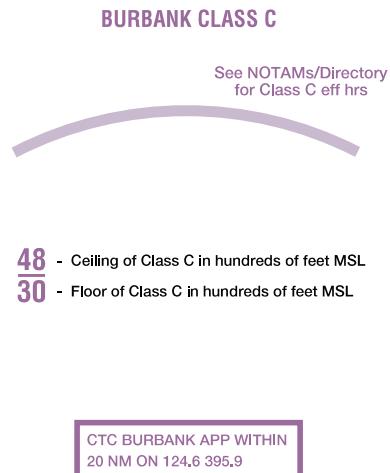
All radials are magnetic.

AIRSPACE INFORMATION (Continued)

Class C Airspace

Appropriate notes as required may be shown.

(Mode C see FAR 91.215/
AIM)



Class E Airspace

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

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



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



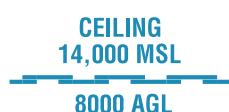
Airspace beginning at 700 feet AGL that laterally abuts uncontrolled (Class G) airspace.



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



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

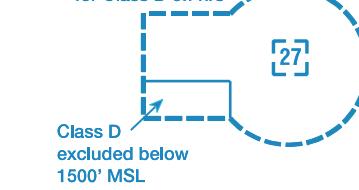


When the ceiling is less than 18,000 feet MSL, the value prefixed by the word "CEILING", shall be shown along the limits.

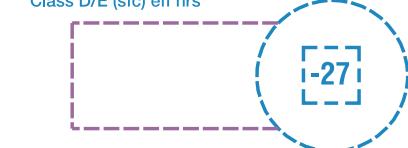
Class D Airspace

Altitude in hundreds of feet MSL

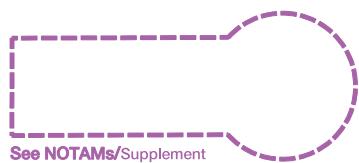
See NOTAMs/Supplement for Class D eff hrs



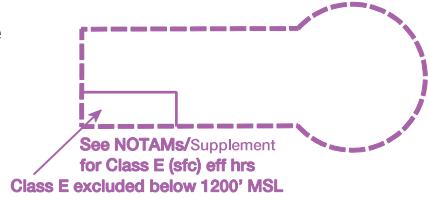
See NOTAMs/Supplement for Class D/E (sfc) eff hrs



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



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



AIRSPACE INFORMATION (Continued)

Class E Airspace (Continued)

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

Low altitude Federal Airways are indicated by centerline.

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

V2N ← 270°

Alternate Airway radial

Total mileage
between NAVAIDS
on direct Airways.

25
V2
Enroute Airway radial

255°

R40

LF / MF Airway

T 319 TK 313

RNAV 2 Route (helicopter only)

BR 63V ← 265°

125 Bahama Route

A 301

Oceanic & ATS Route

AR5

Atlantic Route

B ROUTE 2

Class G Route

A 301 T 319

Federal / RNAV 2 Route

Miscellaneous Air Routes

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

The joint route symbol is screened magenta.

Flight Information Regions (FIR)

No FIR exists this side - No ticks

MEXICO FIR MMFR

WINNIPEG FIR CZWG

NEW YORK OCEANIC CTA/FIR KZNY

Oceanic Control Areas (OCA)

OAKLAND OCEANIC
CONTROL AREA

Control Areas (CTA)

MONTERREY CTA SECTOR 3

Offshore Control Areas

ATLANTIC LOW
CONTROL AREA

Class G Airspace

9500 MSL

ATLANTIC LOW
CONTROL AREA

8000 MSL

CONTROL AREA 1148L

Foreign Airspace Note

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

AIRSPACE INFORMATION (Continued)

Special Conservation Areas

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

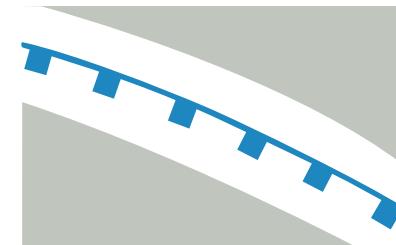


Special Flight Rules Area (SFRA) Relating to National Security

Example: Washington DC

Appropriate notes as required may be shown.

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



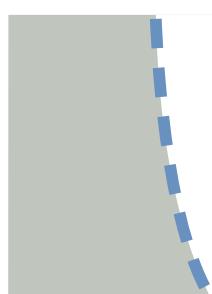
WASHINGTON DC METROPOLITAN AREA SFRA

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

Temporary Flight Restriction (TFR) Relating to National Security

Example: Washington DC

Appropriate notes as required may be shown.

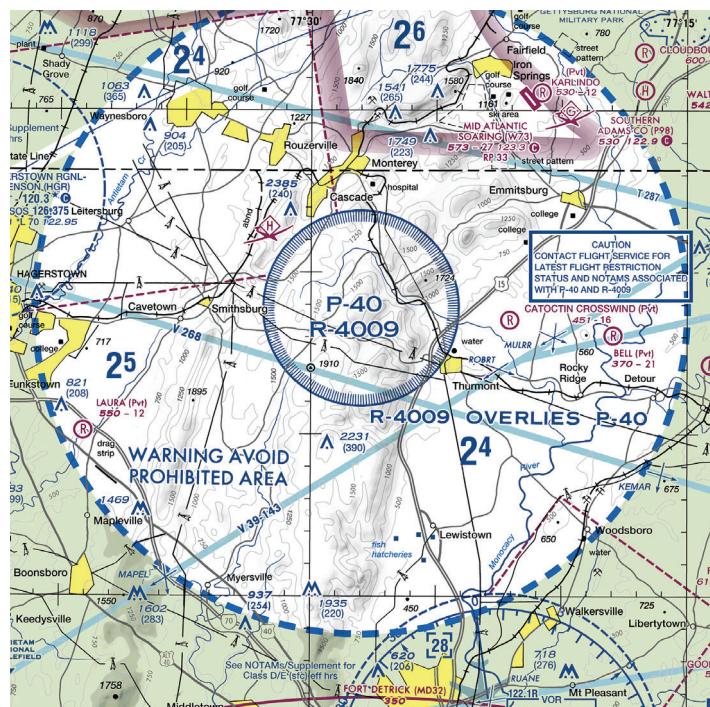
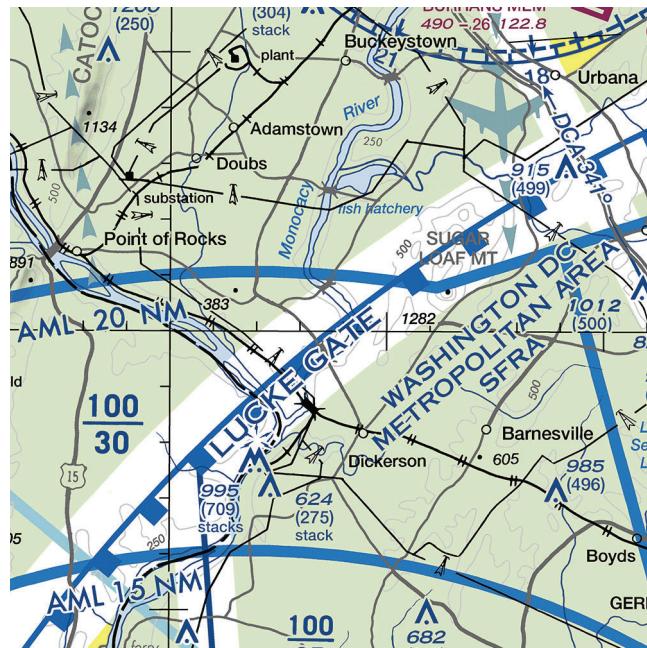


CAUTION
CONTACT FLIGHT SERVICE FOR
LATEST FLIGHT RESTRICTION
STATUS AND NOTAMS ASSOCIATED
WITH P-40 AND R-4009

NOAA Regulated National Marine Sanctuary Designated Areas

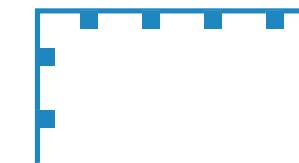


Flight operations below 1000' AGL over the designated areas within the Gulf of Farallones National Marine Sanctuary violate NOAA regulations (see 15 CFR 922).



AIRSPACE INFORMATION (Continued)

Special Flight Rules Area (SFRA)



SPECIAL FEDERAL AVIATION REGULATIONS (SFAR)
14 CFR Part 93, Subpart U and SFAR 50.2 -
GRAND CANYON NATIONAL PARK SPECIAL
FLIGHT RULES AREA. Special regulations apply
to all aircraft operations below 18,000 feet MSL.

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.

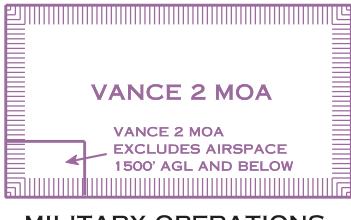


**PROHIBITED, RESTRICTED
or WARNING AREA**

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



ALERT AREA



**MILITARY OPERATIONS
AREA (MOA)**

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

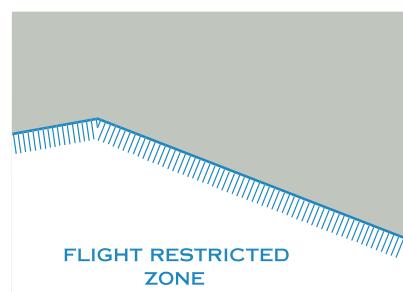
Appropriate boxed note as required
shown adjacent to area.

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



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

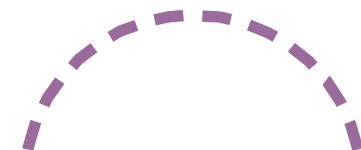
Flight Restricted Zone (FRZ) Relating to National Security



**FLIGHT RESTRICTED
ZONE**

National Security Area

Appropriate notes as
required may be shown



Small Area



Special Awareness Training Areas



Mode C (FAR 91.215)

Appropriate notes as
required may be shown.



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

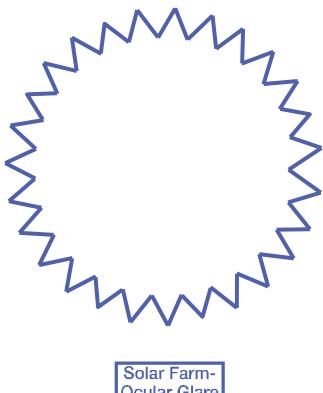
Air Defense Identification Zone (ADIZ)

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

**CONTIGUOUS
U.S. ADIZ**

AIRSPACE INFORMATION (Continued)

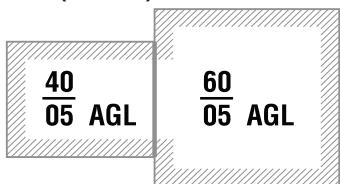
High Energy Radiation Areas



Military Training Routes (MTR)

VR269

Special Military Activity Routes (SMAR)

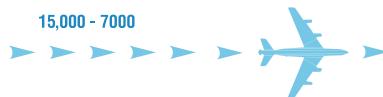


Boxed notes shown adjacent to route.

**40
05 AGL**

IFR Routes

Arrival



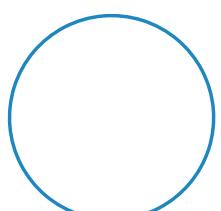
Departure



Arrival/Departure



Special Security Notice Permanent Continuous Flight Restriction Areas



DISNEYLAND THEME PARK
See Note for requirements

Sporting Event Temporary Flight Restriction (TFR) Sites

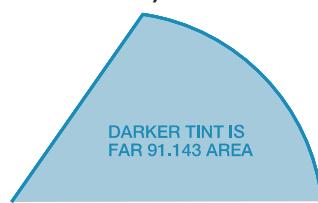
STADIUM

National Defense Airspace Temporary Flight Restriction (TFR) Areas



Dallas National Defense Airspace TFR Check NOTAMS

Space Operations Area (FAR Part 91.143)



Miscellaneous Activity Areas

Aerobic Practice Area



Glider Operations



Hang Glider Activity



Ultralight Activity



Unmanned Aircraft Activity



Parachute Jumping Area with Frequency



Space Launch Activity Area



AIRSPACE INFORMATION (Continued)

VFR Transition Routes

Appropriate notes as required may be shown.

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

Uni-directional



Bi-directional



Bi-directional with NAVAID Ident and Radial



Terminal Radar Service Area (TRSA)

TRSA Name

HARRISBURG TRSA

TRSA Boundaries



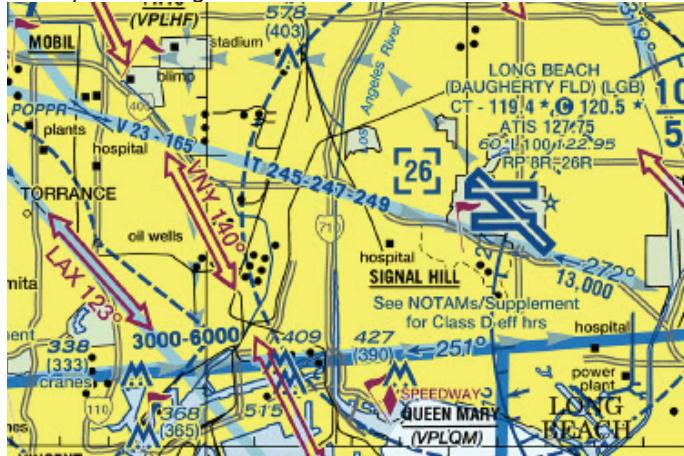
TRSA Sectors

Appropriate notes as required may be shown.

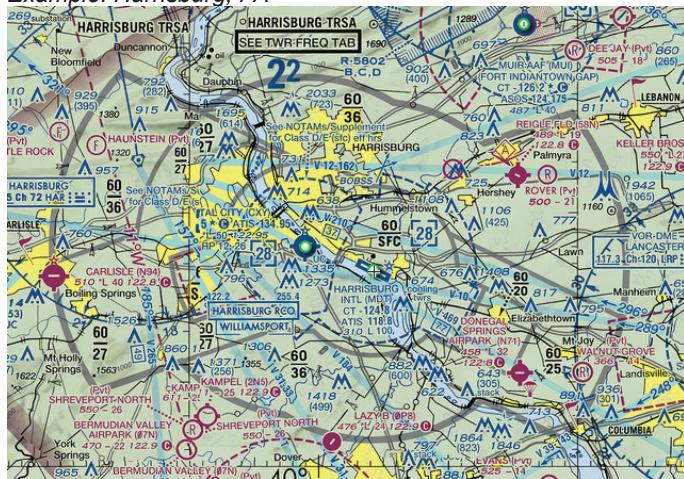
80
40 - Ceiling of TRSA in hundreds of feet MSL
- Floor of TRSA in hundreds of feet MSL

SEE TWR FREQ TAB

Example: Los Angeles



Example: Harrisburg, PA



NAVIGATIONAL AND PROCEDURAL INFORMATION

Isogonic Line and Value

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



Local Magnetic Notes

Unreliability Notes

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

Aeronautical Lights

By Request



Rotating or Oscillating

Isolated Location



Rotating Light with Flashing Code Identification Light

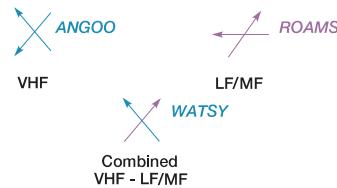


Rotating Light with Course Lights and Site Number



Intersections

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



NAVIGATIONAL AND PROCEDURAL INFORMATION (Continued)

Airport Beacons

Rotating or Flashing

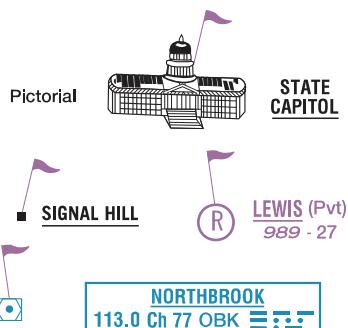


Isolated Locations

2520

VFR Checkpoints

Underline indicates proper name of VFR Checkpoint.



Waypoints

RNAV

GRANT

VFR Stand-Alone

VPXYZ

VFR Collocated with Checkpoint

NAME (VPXYZ)

Obstruction

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

1473
(394)
bldg

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

628
UC

1000' and higher (AGL)

3368
(1529)

Wind Turbine

2179
(315)

High-Intensity Obstruction Lights

Less than 1000' (AGL)



1000' and higher (AGL)



Wind Turbine



Group obstruction



Wind Turbines



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

Marine Lights

With Characteristics of Light

Oc
R SEC
Land Light

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

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

Group Obstruction

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

1062
(227)

1000' and higher (AGL)

4977
(1432)

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

2889
(1217)

Wind Turbines

2735
(415)

Wind Turbine Farms

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



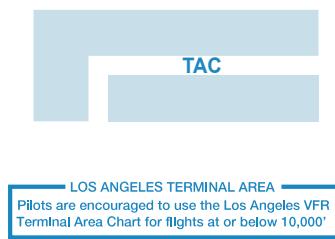
Maximum Elevation Figure (MEF)

(see VFR Terms tab for explanation)

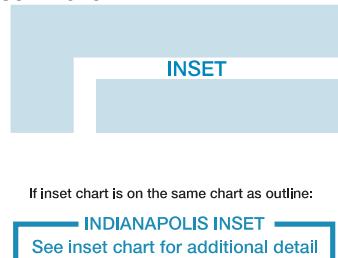
NAVIGATIONAL AND PROCEDURAL INFORMATION (Continued)

Chart Limits

Outline on Sectional of Terminal Area Chart



Outline on Sectional of Inset Chart



Outline of Special Chart on Sectional and Terminal Area Chart



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

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

CULTURE

Railroads

Single Track



Double Track



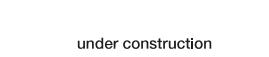
More Than Two Tracks



Electric



Non-operating, Abandoned or Under Construction



Roads

Dual-Lane Divided Highway
Category 1



Primary
Category 2



Secondary
Category 2



Trails

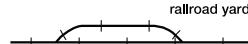
Category 3



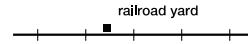
Provides symbolization for dismantled railroad when combined with label "dismantled railroad."

Railroad Yards

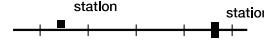
Limiting Track To Scale



Location Only



Railroad Stations

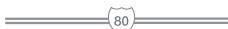


Railroad Sidings and Short Spurs



Road Markers

Interstate Route No.



U.S. Route No.



Air Marked Identification Label



Road Names

LINCOLN HIGHWAY



Roads Under Construction

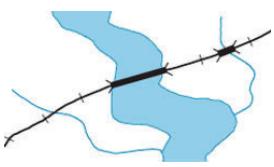


CULTURE (Continued)

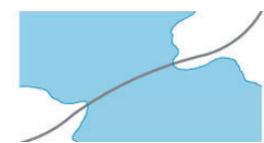
Related Features to Railroads and Roads

Bridges and Viaducts

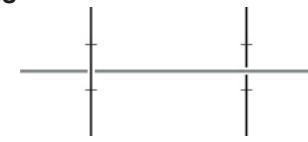
Railroad



Causeways



Overpasses and Underpasses



Tunnels-Road and Railroad



Populated Places

Yellow tinted areas indicate populated places.

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



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

Large Cities Category 1

- population more than 250,000

ST LOUIS

Cities and Large Towns Category 2

- population 25,000 to 250,000

NASHVILLE

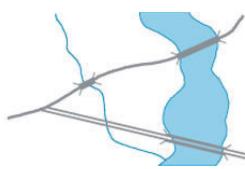
Towns and Villages Category 3

- population less than 25,000

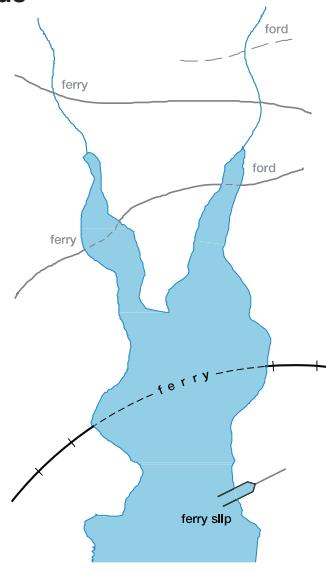
Frankfort

Bridges and Viaducts

Road



Ferries, Ferry Slips and Fords



CULTURE (Continued)

Boundaries

International



State or Province

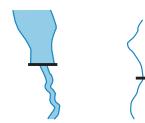


Convention or Mandate Line



Miscellaneous Cultural Features

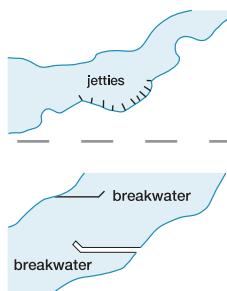
Dams



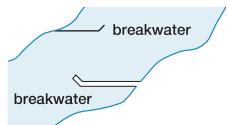
Passable Locks



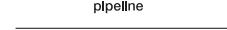
Weirs and Jetties



Breakwaters



Pipelines



Underground



Landmark Features

- substation
- fort
- cemetery

Mines or Quarries

Shaft Mines or Quarries



Wells

Other than water

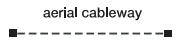


Lookout Towers

(Elevation Base of Tower)



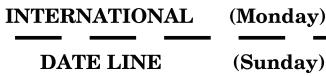
Aerial Cableways, Conveyors, Etc.



Time Zones



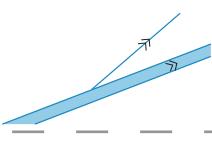
Date Line



Dam Carrying Road



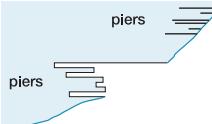
Small Locks



Seawalls



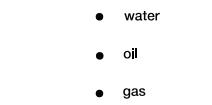
Piers, Wharfs, Quays, etc.



Power Transmission and Telecommunication Lines



Tanks



Outdoor Theater



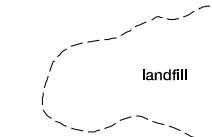
Race Tracks



Coast Guard Station

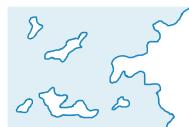


Landmark Areas



HYDROGRAPHY

Open Water



Open/Inland Water



Lakes

Label as required.



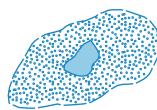
Perennial

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



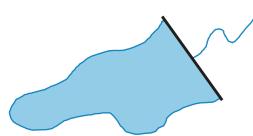
Non-Perennial

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



Reservoirs

Natural Shorelines



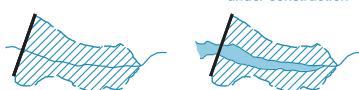
Man-made Shorelines
Label when necessary for clarity



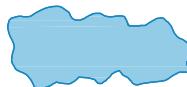
Too small to show to scale



Under Construction



Inland Water



Shorelines

Definite



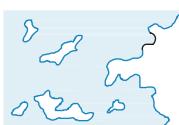
Fluctuating



Unsurveyed
Indefinite



Man-made



HYDROGRAPHY (Continued)

Streams

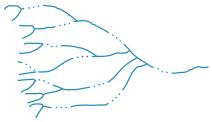
Perennial



Non-Perennial



Fanned Out



Alluvial fan



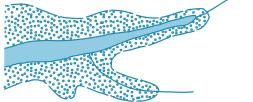
Braided



Disappearing

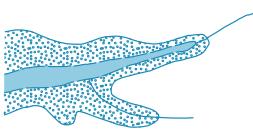


Seasonally Fluctuating

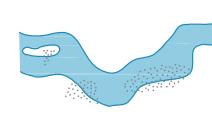


with undefined limits

with maximum bank limits,
prominent and constant

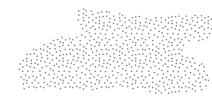


Sand Deposits in and along
riverbeds



Wet Sand Areas

Within and adjacent to desert areas



Canals

ERIE



To Scale



Abandoned or Under Construction

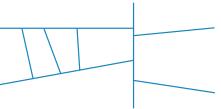


Abandoned to Scale

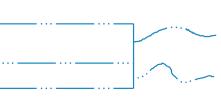


Small Canals and Drainage / Irrigation Ditches

Perennial



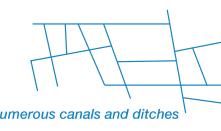
Non-Perennial



Abandoned or Ancient
Numerous



Representative pattern and/or
descriptive note.



numerous canals and ditches

Aqueducts

aqueduct



Abandoned or Under Construction



Underground



Suspended or Elevated



Tunnels



Kanats

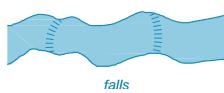


Underground with Air Vents

HYDROGRAPHY (Continued)

Falls

Double-Line

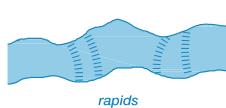


Single-Line



Rapids

Double-Line

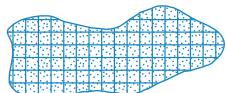


Single-Line



Salt Evaporators and Salt Pans Man Exploited

salt pans



Hummocks and Ridges

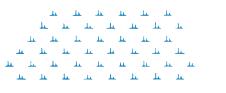


Peat Bogs

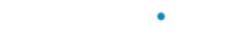


Rice Paddies

Extensive areas indicated
by label only.



Springs, Wells and Waterholes



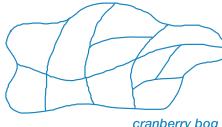
Swamps, Marshes and Bogs



Mangrove And Nipa



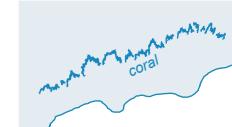
Cranberry Bogs



Land Subject To Inundation



Reefs-Rocky or Coral



Fish Ponds and Hatcheries



Miscellaneous Underwater Features Not Otherwise Symbolized



Wrecks

Exposed



Rocks-Isolated

Bare or Awash



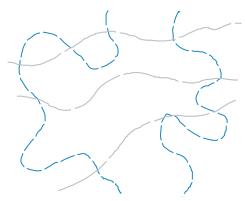
Tundra

tundra

HYDROGRAPHY (Continued)

Permanent Snow and Ice Areas

Glaciers



Glacial Moraines



Ice Cliffs

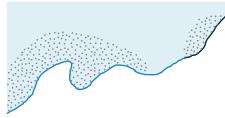


Snowfields, Ice Fields And Ice Caps



Foreshore Flats

Tidal flats exposed at low tide.



RELIEF

Contours

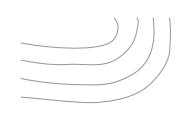
Basic



Approximate



Intermediate



Auxiliary



Ice

Permanent Polar Ice



Pack Ice

Ice Peaks



Depression
(Illustration includes mound within depression)



Values

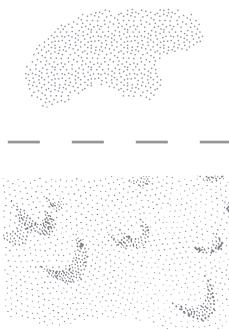


RELIEF (Continued)

Sand or Gravel Areas

Sand Dunes

To Scale



Hachuring



Spot Elevations

Position Accurate



Position Accurate, Elevation Approximate



Highest in General Area



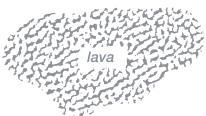
Highest on Chart



Mountain Pass



Distorted Surface Areas



Lava Flows



Sand Ridges

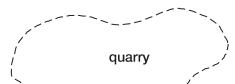
To Scale



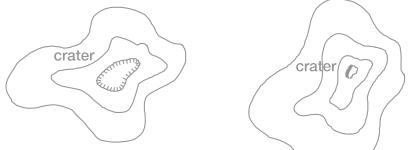
Shaded Relief



Quarries To Scale

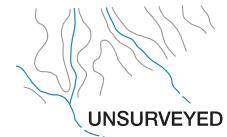


Craters



Unsurveyed Areas

Label appropriately as required



Levees And Eskers



Rock Strata Outcrop



Strip Mines, Mine Dumps And Tailings

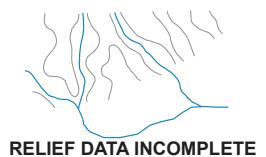


Escarpsments, Bluffs, Cliffs, Depressions, Etc.



Uncontoured Areas

Label appropriately as required



VFR FLYWAY PLANNING CHARTS

GENERAL INFORMATION

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

AIRPORTS

Landplane

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

FAR 91 - Fixed wing special VFR operations prohibited.

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

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

RADIO AIDS TO NAVIGATION

VHF Omni-Directional Radio Range (VOR)



VORTAC



VOR-DME



DME



Example: DME co-located at an airport.



Landplane (continued)

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

FOREIGN



Foreign Airport Note

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

Non-Directional Radio Beacon (NDB)



WDP 396

Underline indicates no voice on this frequency



LSJ 206

NAVAIDS Used to Define Class Airspace

ILS - DME



Shared ILS - DME



AIRSPACE INFORMATION

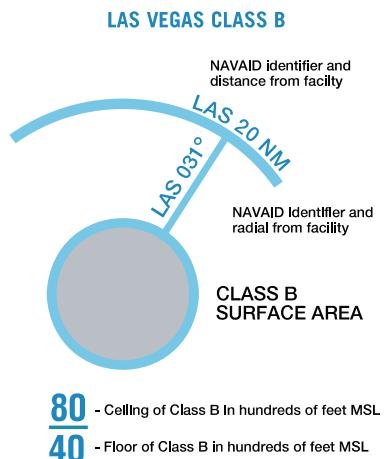
Class B Airspace

Appropriate notes as required
may be shown.

(Mode C see
FAR 91.215/ AIM)

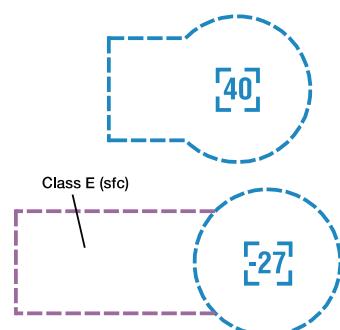
All mileages are nautical (NM).

All radials are magnetic.



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

Class D Airspace



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

ALTITUDE IN HUNDREDS OF FEET MSL.

Special Airspace Areas

Special Flight Rules Area (SFRA) Relating to National Security

Example: Washington DC

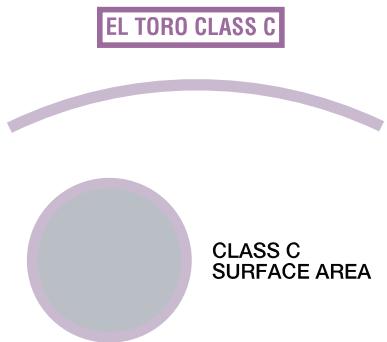
Appropriate notes as required may be shown.

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

Class C Airspace

Appropriate notes as required may be shown.

(Mode C see
FAR 91.215/ AIM)



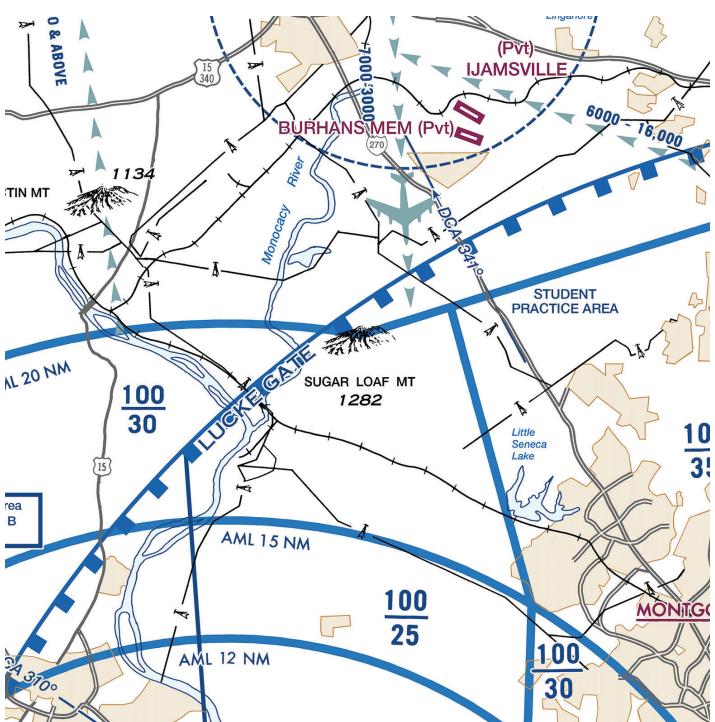
48
30

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

T
SFC

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

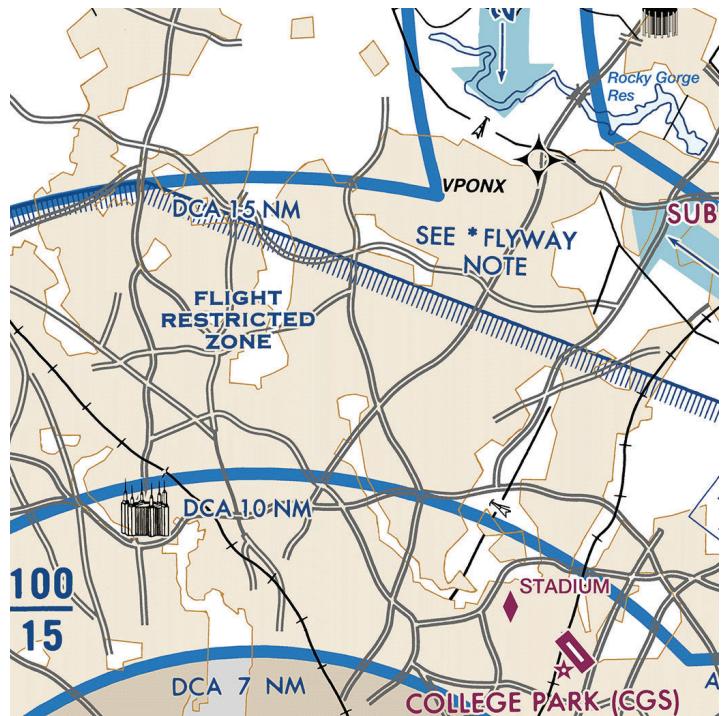
Class E Surface (SFC) Airspace



AIRSPACE INFORMATION (Continued)

Flight Restricted Zone (FRZ) Relating To National Security

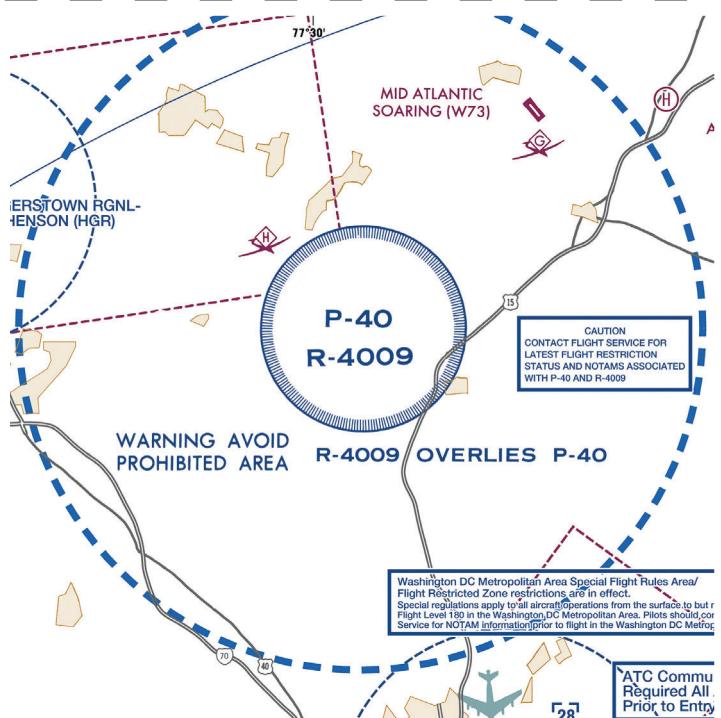
Example: Washington DC



Temporary Flight Restriction (TFR) Relating To National Security

Example: Washington DC

Appropriate notes as required may be shown.



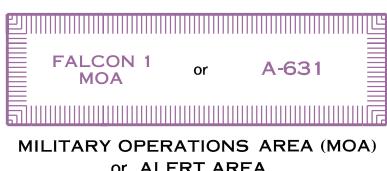
FAA Chart Users' Guide - VFR Chart Symbology - Flyway Planning Charts

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.



Air Defense Identification Zone (ADIZ)

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

CONTIGUOUS U.S. ADIZ

Foreign Airspace Note

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

AIRSPACE INFORMATION (Continued)

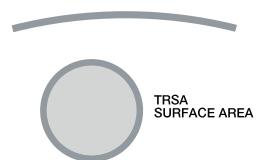
Special Air Traffic Rules/Airport Traffic Areas (FAR Part 93)

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



Terminal Radar Service Area (TRSA)

PALM SPRINGS TRSA



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

IFR Routes

Arrival



Departure



Arrival/Departure



VFR Transition Routes

Appropriate notes as required may be shown.



Uni-directional



Bi-directional



Bi-directional with NAVAID Ident and Radial



Special Conservation Areas

NOAA Regulated National Marine Sanctuary Designated Areas



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

Mode C (FAR 91.215)

Appropriate notes as required may be shown.



Sporting Event Temporary Flight Restriction (TFR) Sites



National Defense Airspace Temporary Flight Restriction (TFR) Areas



Dallas National Defense Airspace TFR Check NOTAMs

Miscellaneous Activity Areas

Aerobic Practice Area



Glider Operations



Hang Glider Activity



Ultralight Activity



Unmanned Aircraft Activity



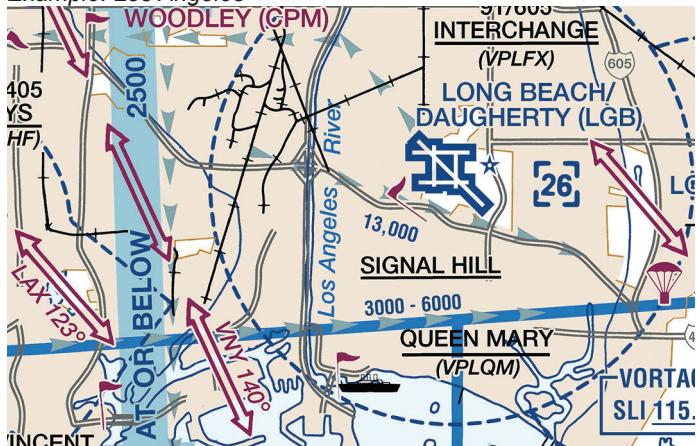
Parachute Jumping Area with Frequency



Space Launch Activity Area

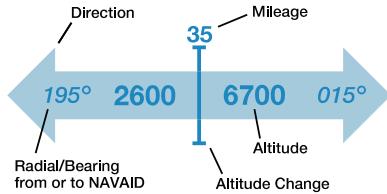


Example: Los Angeles



AIRSPACE INFORMATION (Continued)

Suggested VFR Flyway And Altitude



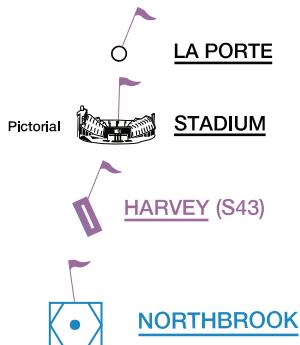
Military Training Routes (MTR)

IR21

NAVIGATIONAL AND PROCEDURAL INFORMATION

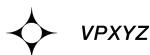
VFR Checkpoints

Underline indicates proper name of VFR Checkpoint



VFR Waypoints

Stand-Alone



Collocated with VFR Checkpoint



Navigational Data

+ N38°56.32'
W76°36.91'

- POWER PLANT
N32°27.12'
W70°15.73'

ATL 25 NM
ATL 033/25 NM
N33°59.18'
W84°10.62'

Obstructions

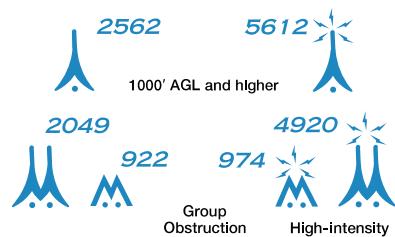
Obstacles may be lit or unlit.



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



less than 1000' AGL



Under Construction or reported and position/elevation unverified.



CULTURE

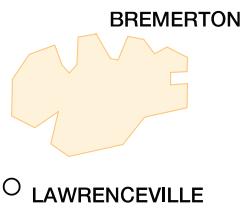
Railroads

Single and Multiple Tracks



Populated Places

Built-up Areas



Towns

LAWRENCEVILLE

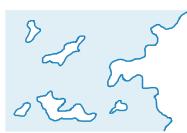
BOUNDARIES

International



HYDROGRAPHY

Shorelines



RELIEF

Spot Elevations

Position Accurate
Mountain Peaks



Roads

Dual-Lane



Divided Highway Primary



Prominent Pictorials



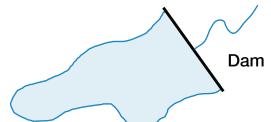
Power Transmission Lines



Landmarks

POWER PLANT

Reservoirs



Major Lakes and Rivers



HELICOPTER ROUTE CHARTS

GENERAL INFORMATION

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

AIRPORTS

Landplane

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



- Public
- Private
- Unverified
- Abandoned
- Foreign



Airport Data Grouping

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

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

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

Flight Service Station on field

FSS

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

NO SVFR

Indicates FAR 93 Special Air Traffic Rules and Airport Traffic

NAME

Location Identifier

(NAM)

ICAO Location Identifier

(PNAM)

Control Tower (CT) - primary frequency

CT - 119.1

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

*

When lighting is lacking, the respective character is replaced by a dash.

Lighting codes refer to runway edge lights and may not represent the longest runway or full length lighting. Dashes are not shown on heliports or helipads unless additional information follows the elevation (e.g. UNICOM, CTAF).

Seaplane



Heliport

Heliports public and private



Medical Center



Helipads located at major airports
(when requested)



Ultralight Flight Park



Foreign Airport Note

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



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

Automated Terminal
Information Service

ATIS 115.4

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

ASOS/AWOS 135.42

Elevation in feet

285

Lighting in operation Sunset to Sunshine

L

Lighting limitations exists, refer
to Chart Supplement

'L

UNICOM - Aeronautical advisory station

122.95

Follows the Common Traffic Advisory
Frequency (CTAF)

C

Unverified Heliport

(Unverified)

Airport of Entry

AOE

AIRSPACE INFORMATION

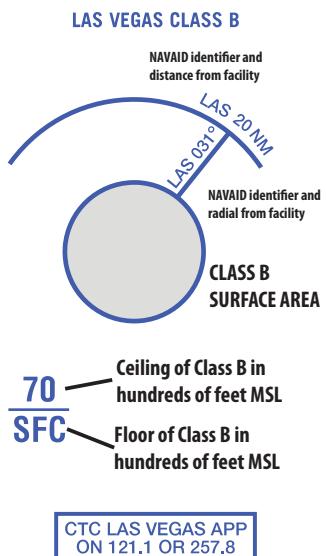
Class B Airspace

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

All mileages are nautical (NM)

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

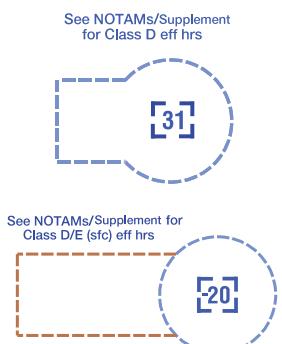
All radials are magnetic.



Class D Airspace

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

Altitudes in hundreds of feet MSL.



Special Airspace Areas

Special Flight Rules Area (SFRA) Relating to National Security

Example: Washington DC

Appropriate notes as required may be shown.

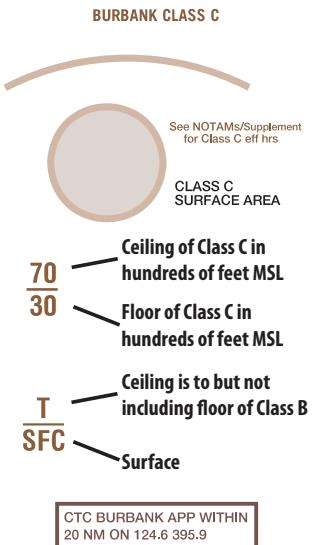
Note: Delimiting line not shown when it coincides with International Boundary, projection lines or other linear features.



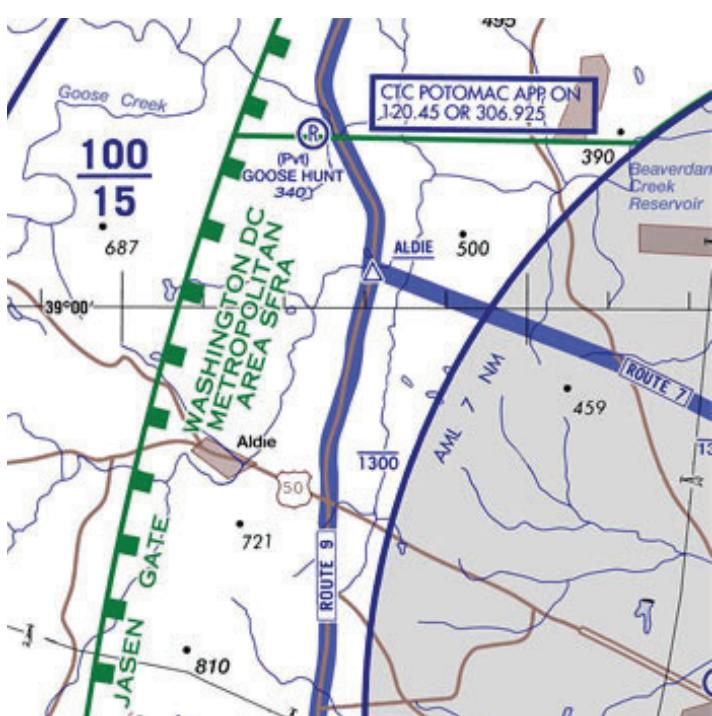
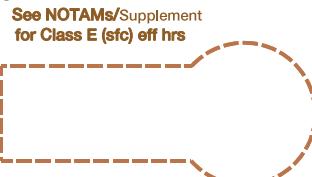
Washington DC Metropolitan Area Special Flight Rules Area (SFRA). This area is subject to all aircraft operations from the surface to but not including Flight Level 180 in the Washington DC Metropolitan Area. Please contact ATC Service for NOTAM information prior to flight within Washington DC-Metropolitan Area.

Class C Airspace

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



Class E Surface (SFC) Airspace



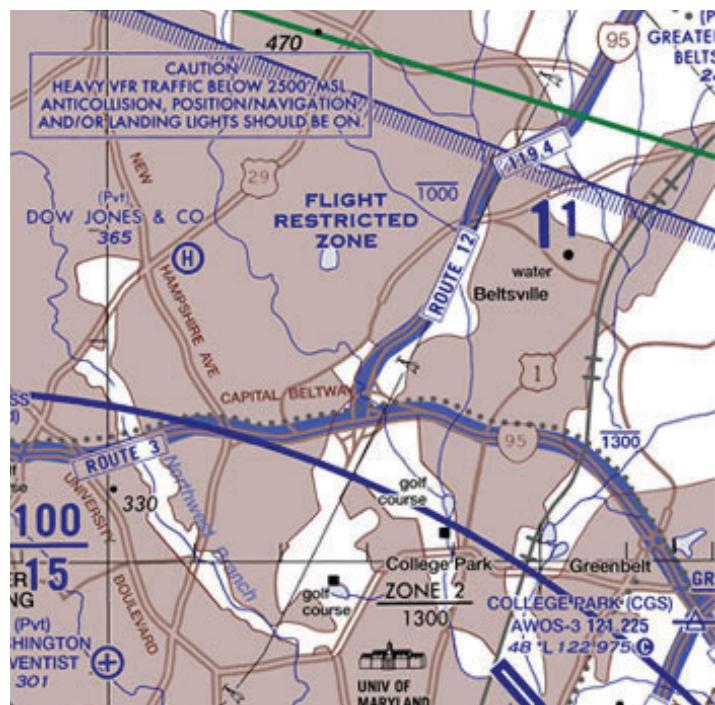
AIRSPACE INFORMATION (Continued)

Special Airspace Areas (Continued)

Flight Restricted Zone (FRZ) Relating to National Security



Example: Washington DC



Air Defense Identification Zone (ADIZ)

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

CONTIGUOUS U.S. ADIZ



Special Security Notice Permanent Continuous Flight Restriction Areas

DISNEYLAND THEME PARK See Panel for requirements

Mode C (FAR 91.215)

Appropriate notes as required may be shown.

MODE C & ADS-B OUT

30 NM

Terminal Radar Service Area (TRSA)

PALM SPRINGS TRSA



SEE TWR FREQ TAB

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

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

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



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

Sporting Event Temporary Flight Restriction (TFR) Sites



National Defense Airspace Temporary Flight Restriction (TFR) Areas



Dallas National Defense Airspace TFR Check NOTAMs

AIRSPACE INFORMATION (Continued)

Miscellaneous Activity Areas

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

Military Training Routes (MTR)

Helicopter Routes

Primary Route with Route Name and Tower Frequency	
Secondary Route	
Transition Symbol	

Reporting Points

Non-compulsory	
Compulsory	
Reporting Point Name	

Foreign Airspace Note

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

Police Zones

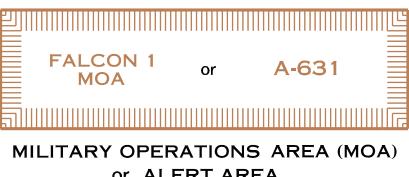
.....
ZONE 8
1000

Special Use Airspace

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



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



One-way Route



Altitude Changeover Point



Recommended Altitudes

Maximum Altitude	
Minimum Altitude	
Recommended Altitude	

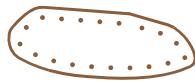
AIRSPACE INFORMATION (Continued)

Special Conservation Areas

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



NOAA Regulated National Marine Sanctuary Designated Areas

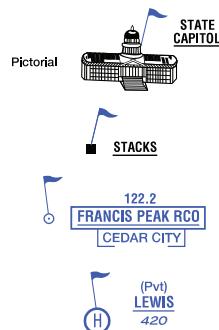


Flight operations below 1000' AGL over the designated areas within the Gulf of Farallones National Marine Sanctuary violate NOAA regulations (see 15 CFR 922).

NAVIGATIONAL AND PROCEDURAL INFORMATION

VFR Checkpoints

Underline indicates proper name of VFR Checkpoint.



Obstruction

Above 299' and below 1000' AGL



1000' and higher AGL



High-Intensity Obstruction Lights

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



Navigation Data



VFR Waypoints

Stand-Alone



Collocated with VFR Checkpoint



Collocated with VFR Checkpoint & Reporting Point



Group Obstruction

Above 299' and below 1000' AGL



1000' and higher AGL



Wind Turbine Farms

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



Maximum Elevation Figure (MEF)

(see VFR Terms tab for explanation)

124

CULTURE

Railroads

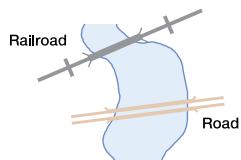
Single Track



Double Track

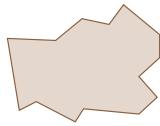


Bridges



Populated Places

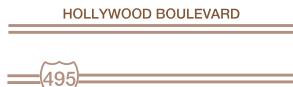
Built-up Areas



Roads

Dual-Lane:

Divided Highways



Major Boulevards & Major Streets
Primary



(25)

Boundaries

International



State or Province



Power Transmission Lines



Prominent Pictorials



TEMPLE

Landmarks

■ Landmark-stadium,
factory, school, etc.

△ Lookout
Tower

▲ Mines or
Quarries

○ Race Track

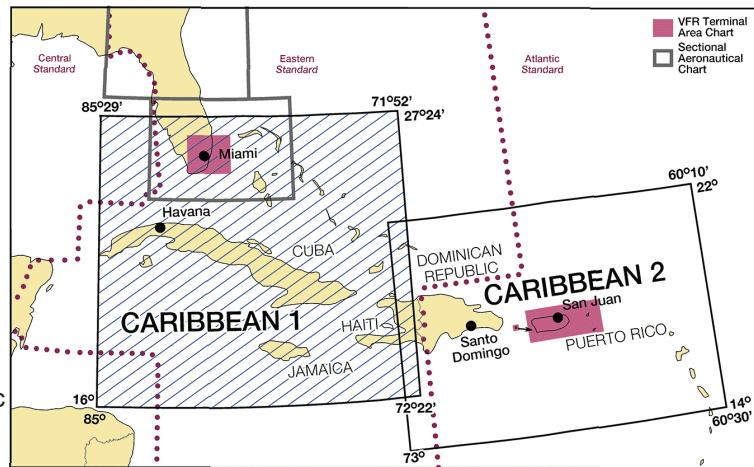
□ Outdoor
Theater

● Tank-water,
oil or gas

CARIBBEAN VFR AERONAUTICAL CHARTS (CAC)

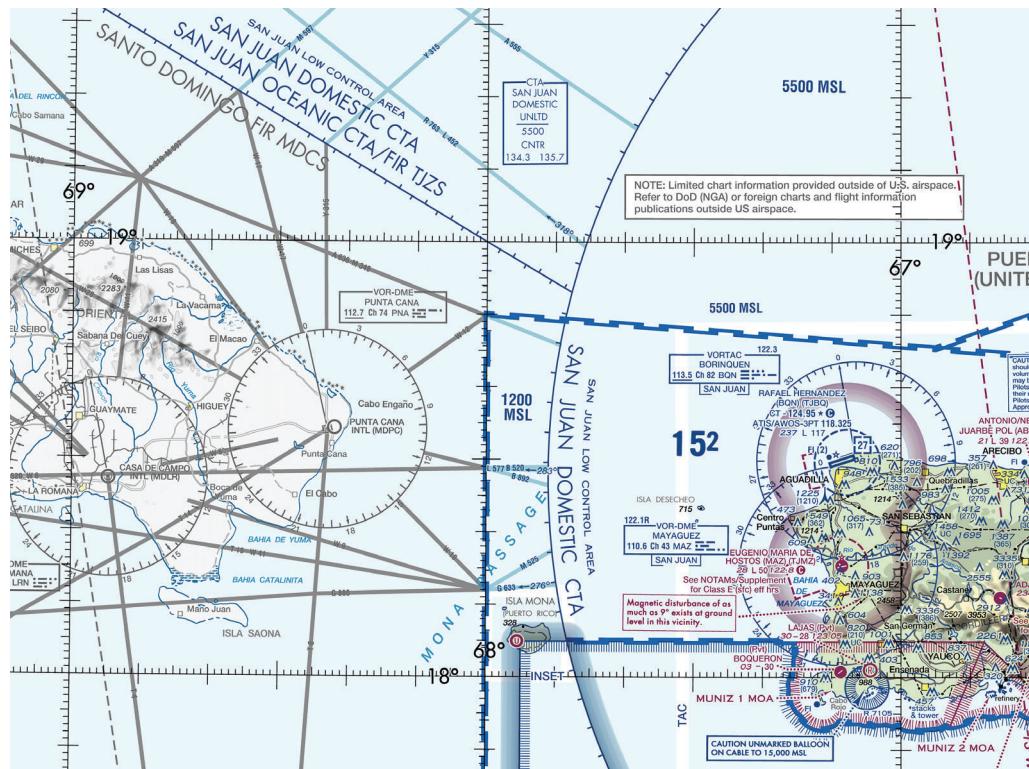
The Caribbean Charts are published as two VFR Charts: Caribbean 1 (CAC-1) covers Southern Florida, Cuba, Haiti and the Bahamas; Caribbean 2 (CAC-2) covers Puerto Rico, Haiti, Dominican Republic, the Lesser Antilles and Leeward Islands. Charts are updated every 56-day chart cycle.

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

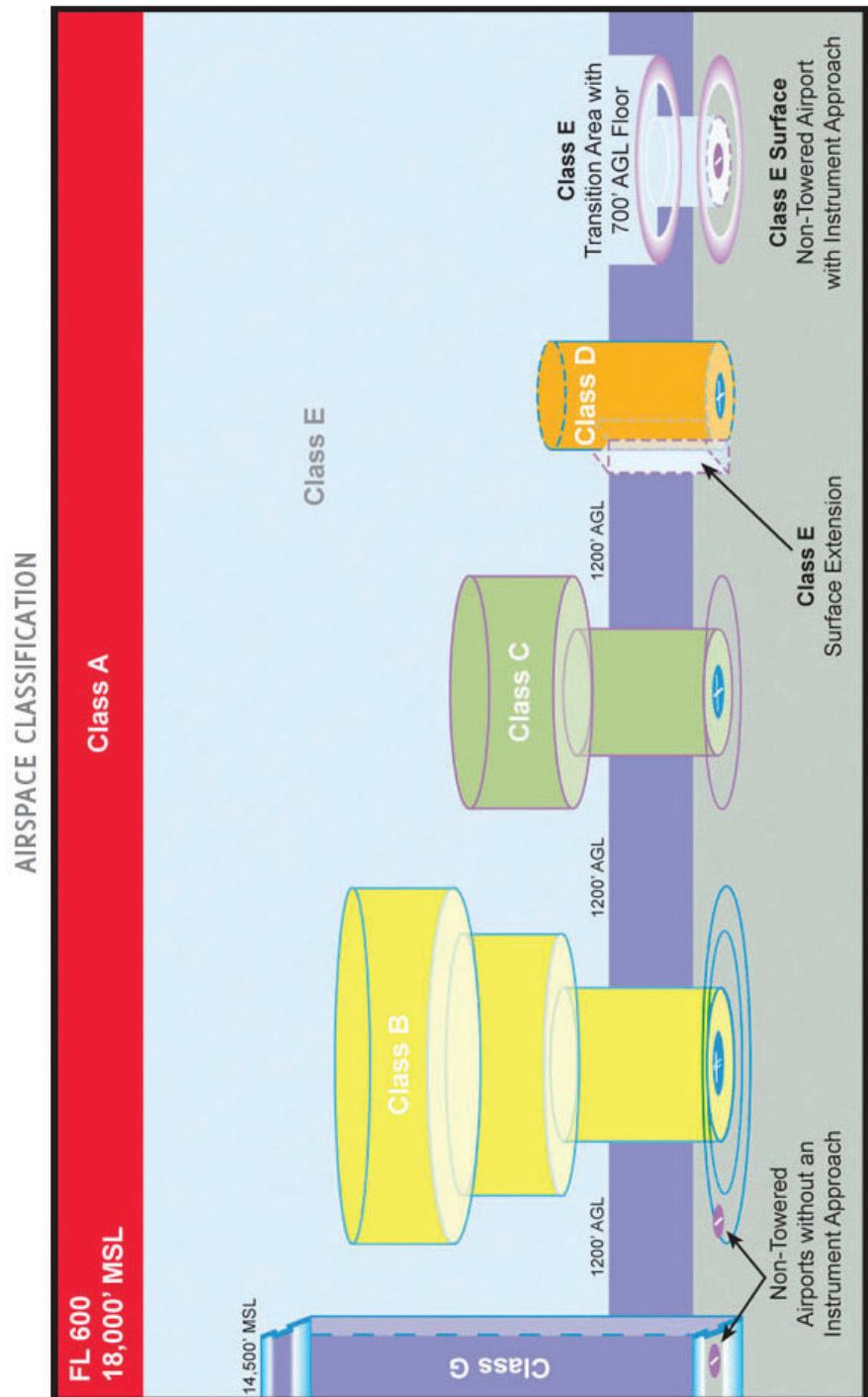


The chart symbols used on the Caribbean Charts are similar to those used in the Sectional and Terminal Area Charts, the major difference being in scale. The Caribbean VFR Chart scale is 1:1,000,000 versus the Sectional Chart Scale of 1:500,000 and Terminal Area Chart Scale of 1:250,000. Chart symbology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

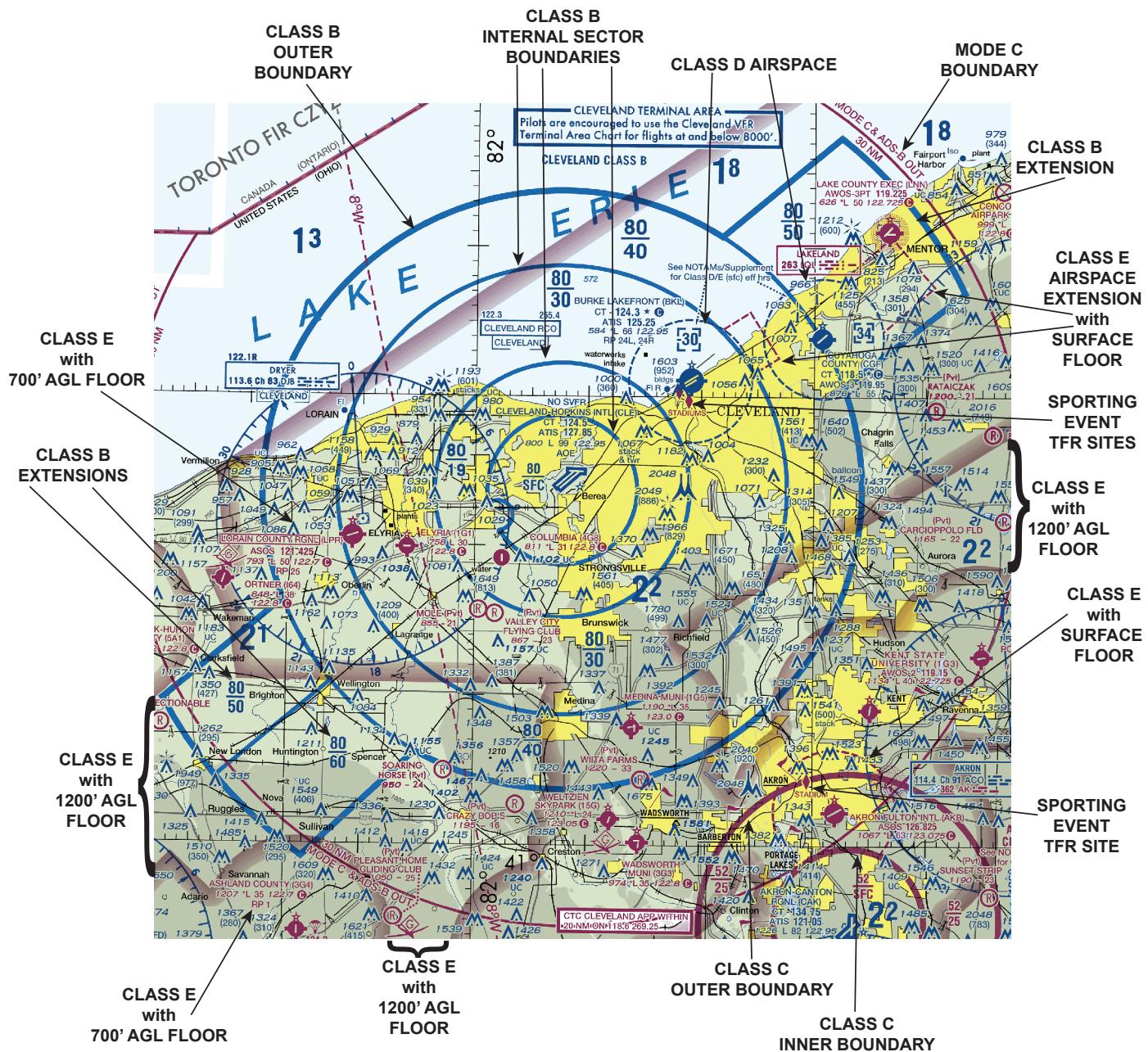
Example from Caribbean 2 VFR Aeronautical Chart



AIRSPACE



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



Excerpt from Detroit Sectional Chart

EXPLANATION OF IFR ENROUTE TERMS

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

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

AIRPORTS

Operational airports are shown on IFR Enroute Charts.

Low Charts:

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

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

High Charts:

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

Charted airports are classified according to the following criteria:



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

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

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

Black - Foreign airports

Airports are plotted at their true geographic position.

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

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

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

AIRPORT DATA DEPICTION	
Low Altitude	<p>Minimum Operational Network Airport Designator → MON CITY Airport Ident ICAO Location Indicator shown outside contiguous U.S. → (APT) (ICAO) [D]* Airport Elevation → 280 0* 43s ATIS or AFIS (Alaska Only) → AWOS-3PT 128.326 (A) *109.8 Part-time Frequency Lighting Capability: ASOS/AWOS</p> <p>Part-time or established by NOTAM. See Chart Supplement for times of operation. Longest runway length to nearest 100 feet with 70 feet as the dividing point (add 00) s indicates soft surface</p>
1. Airport elevation given in feet above or below mean sea level 2. Pvt - Private use, not available to general public 3. A solid line box enclosed the airport name indicates FAR 93 Special Requirements - see Directory/Supplement 4. "NO SVFR" above the airport name indicates FAR 91 fixed-wing special VFR flight is prohibited. 5. C or D following the airport identifier indicates Class C or Class D Airspace	<p>6. Associated city names for public airports are shown above or preceding the airport name. If airport name and city name are the same, only the airport name is shown. The airport identifier in parentheses follows the airport name. City names for military and private airports are not shown.</p> <p>7. Airport Ident ICAO Location Indicator shown outside contiguous U.S.</p> <p>8. AFIS Alaska only</p>
High Altitude - U.S.	<p>Minimum Operational Network Airport Designator → MON CITY Associated City → MON CITY Airport Name (APT) → APT Airport Identifier → APT</p>
HIGH ALTITUDE - ALASKA <p>Minimum Operational Network Airport Designator → MON CITY Associated City → MON CITY Airport Name (APT) (ICAO) → (APT) (ICAO) Longest runway length → 00 00s Part-time s indicates soft surface</p>	
LIGHTING CAPABILITY	
<ul style="list-style-type: none"> L Lighting Available (L) Pilot Controlled Lighting 	<ul style="list-style-type: none"> ★ Part-time or on request - No lighting available At private facilities- indicates no lighting information is available

A **L** symbol between the airport elevation and runway length means that runway lights are in operation sunset to sunrise. A **(L)** symbol indicates there is Pilot Controlled Lighting. A **L*** symbol means the lighting is part-time or on request, the pilot should consult the Chart Supplement for light operating procedures. The Aeronautical Information Manual (AIM) thoroughly explains the types and uses of airport lighting aids.

VOR Minimum Operational Network (MON) Airports Designator

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

RADIO AIDS TO NAVIGATION

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

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

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

NAVIGATION AND COMMUNICATION BOXES - COMMON ELEMENTS	
LOW ENROUTE CHARTS	HIGH ENROUTE CHARTS
<i>RCO Frequencies</i> <i>NAVAID Name, SSV(s)</i> <i>FREQ, Ident, CH, Morse Code</i> <i>Latitude, Longitude</i> <i>Controlling FSS Name</i> <div style="text-align: center; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> 000.0 NAME (VL) (T) 000.0 IDT 000 <small>N00°00.00' W000°00.00'</small> </div> <div style="border: 1px solid black; padding: 2px; margin-top: 5px; display: inline-block;"> <small>NAME</small> </div> </div>	<i>RCO Frequencies</i> <i>NAVAID Name</i> <i>Frequency, Ident, SSV(s), Channel</i> <i>Latitude, Longitude</i> <i>Controlling FSS Name</i> <div style="text-align: center; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> 000.0 NAME 000.0 IDT (H) (DL) 000 <small>N00°00.00' W000°00.00'</small> </div> <div style="border: 1px solid black; padding: 2px; margin-top: 5px; display: inline-block;"> <small>NAME</small> </div> </div>
COMMON ELEMENTS (HIGH AND LOW CHARTS)	
RCO FREQUENCY <i>Single Frequency</i> <i>Multiple Frequencies</i> <i>Frequencies transmit and receive except those followed by R and T:</i> <i>R - Receive Only T - Transmit Only</i>	<div style="margin-bottom: 20px;"> 122.6 </div> <div style="text-align: center;"> 255.4 243.0 123.6 122.65 122.2 122.1R 121.5 </div>
NAVAID BOX <i>Thin line NAVAID boxes without frequency(s) and FSS radio name indicates no FSS frequencies available.</i> <i>Shadow NAVAID box indicates NAVAID and Flight Service Station (FSS) have same name.</i>	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> VHF/UHF </div> <div style="text-align: center;"> LF/MF </div> </div> <div style="margin-top: 20px;"> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; width: 150px; height: 30px;"></div> <div style="border: 2px solid brown; padding: 5px; width: 150px; height: 30px;"></div> </div> </div>

NAVAID STANDARD SERVICE VOLUME (SSV) CLASSIFICATIONS

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

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

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

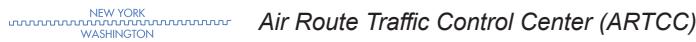
DISTANCE MEASURING EQUIPMENT	
<i>Facilities that operate in the "Y" mode for DME reception</i>	(Y)
VOICE COMMUNICATIONS VIA NAVAID	
Voice Transmitted	112.6
No Voice Transmitted	111.0
NAVAID SHUTDOWN STATUS	
	VHF/UHF LF/MF  
PART TIME OR ON-REQUEST	
	VHF/UHF LF/MF ★ ★
AUTOMATED WEATHER BROADCAST SERVICES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

AIRSPACE INFORMATION

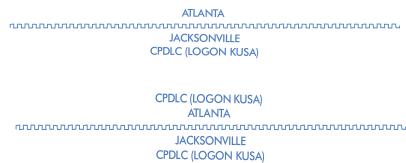
CONTROLLED AIRSPACE

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

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

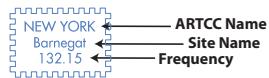


When Controller Pilot Data Link Communication (CPDLC) exists for an ARTCC, the text CPDLC (LOGON KUSA) will be shown parallel to the boundary above or below the ARTCC identification as shown below.



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

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



*ARTCC Remoted Sites with
discrete VHF and UHF frequencies*

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

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

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

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

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

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

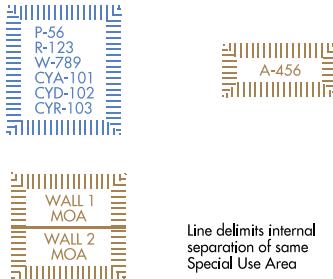
UNCONTROLLED AIRSPACE

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

SPECIAL USE AIRSPACE

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

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

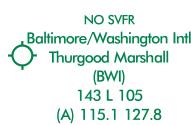


High and Low	Low Altitude Only
P - Prohibited Area	MOA - Military Operations Area
R - Restricted Area	A - Alert Area *
W - Warning Area	

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

OTHER AIRSPACE

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



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



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



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

INSTRUMENT AIRWAYS

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

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

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

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

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

AIRWAY/ROUTE DATA

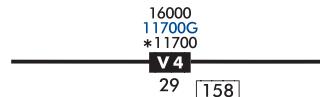
On both series of IFR Enroute Charts, airway/route data such as the airway identifications, magnetic courses bearings or radials, mileages, and altitudes (e.g., Minimum Enroute Altitudes (MEAs), Minimum Reception Altitudes (MRAs), Maximum Authorized Altitudes (MAAs), Minimum Obstacle Clearance Altitudes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

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

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

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

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

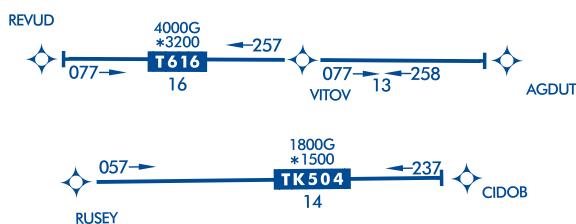


Victor Route (with RNAV/GPS MEA shown in blue)

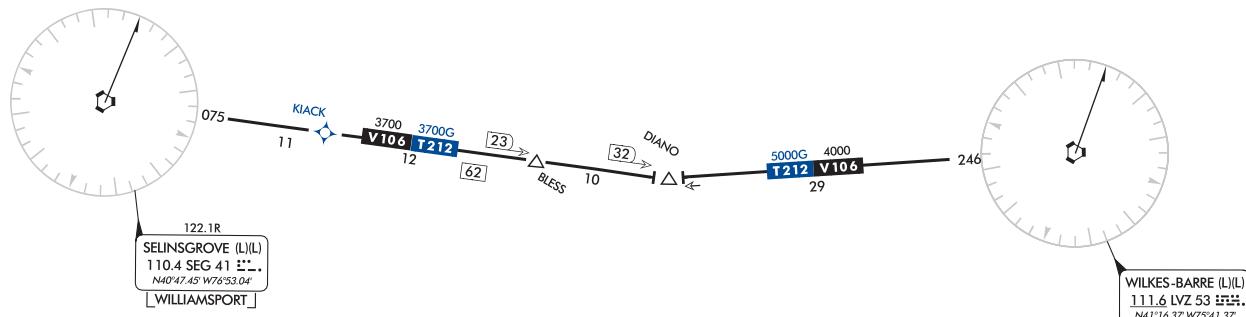
AREA NAVIGATION (RNAV) "T" ROUTE SYSTEM

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

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

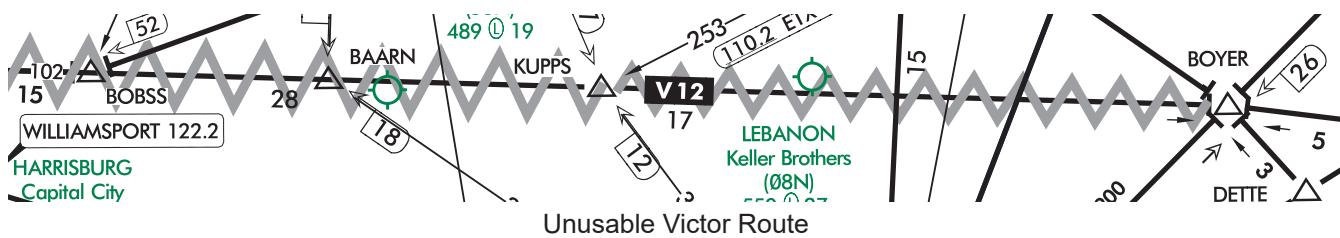


Joint Victor/RNAV routes are charted as outlined above except as noted. The joint Victor route and the RNAV route identification boxes are shown adjacent to each other. Magnetic reference courses are not shown. MEAs are charted above the appropriate identification box or stacked in pairs, GNSS and Victor.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



UNUSABLE AIRWAY/ROUTE SEGMENTS

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



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

Coincident Airways/Routes with Unusable Segment

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



OFF ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)

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

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

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MILITARY TRAINING ROUTES (MTRs)

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

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

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



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



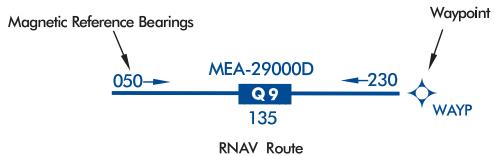
MTRs for particular chart pairs (ex. L1/2, etc.) are alphabetically, then numerically tabulated. The tabulation includes MTR type and unique identification and altitude range.

JET ROUTE SYSTEM (HIGH ALTITUDE ENROUTE CHARTS)

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

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

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



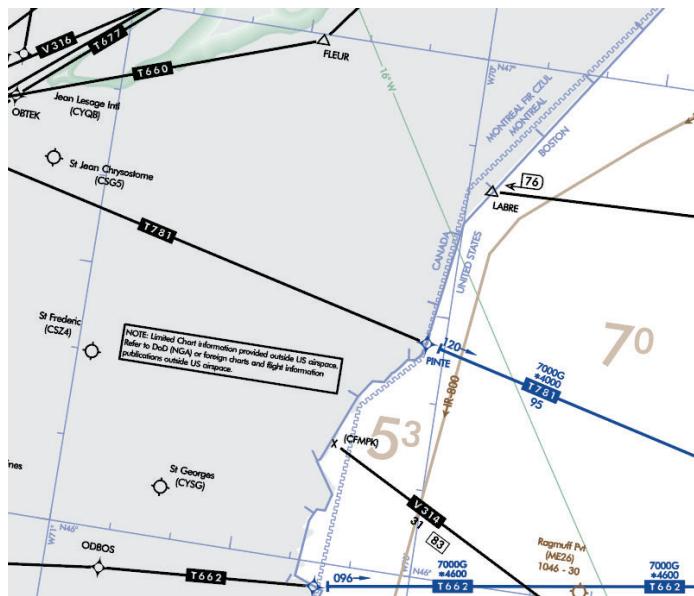
RNAV routes and associated data are charted in blue."Q" Routes on the IFR Gulf of Mexico charts are shown in black. Magnetic reference courses are shown originating from a waypoint, fix/reporting point, or NAVAID.

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

J45 Q19
95
Joint Jet/RNAV Route

FOREIGN AREAS

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



TERRAIN CONTOURS ON AREA CHARTS

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

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

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

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

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

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

AIRPORTS

Airport Data - Low/High Altitude

Civil



Seaplane - Civil

Charts: Low



Civil And Military



Heliport

Charts: Low



Military



Emergency Use Only

Pacific Only



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

All IAP Airports are shown on the Low Altitude Charts.

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

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

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

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

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

Pvt - Private Use

AIRPORT DATA DEPICTION

Low Altitude



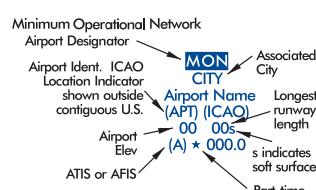
1. Airport elevation given in feet above or below mean sea level
2. Pvt - Private use, not available to general public
3. A solid line box enclosed the airport name indicates FAR 93 Special Requirements - see Directory/Supplement
4. "NO SVFR" above the airport name indicates FAR 91 fixed-wing special VFR flight is prohibited.
5. [C] or [D] following the airport identifier indicates Class C or Class D Airspace

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

7. Airport Ident ICAO Location Indicator shown outside contiguous U.S.

8. AFIS Alaska only

High Altitude - U.S.



Airports (Continued)

LIGHTING CAPABILITY

L Lighting Available

★ Part-time or on request

(L) Pilot Controlled Lighting

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

RADIO AIDS TO NAVIGATION

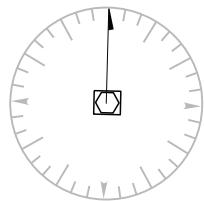
NAVAIDS

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

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

Compass Roses

VHF/UHF



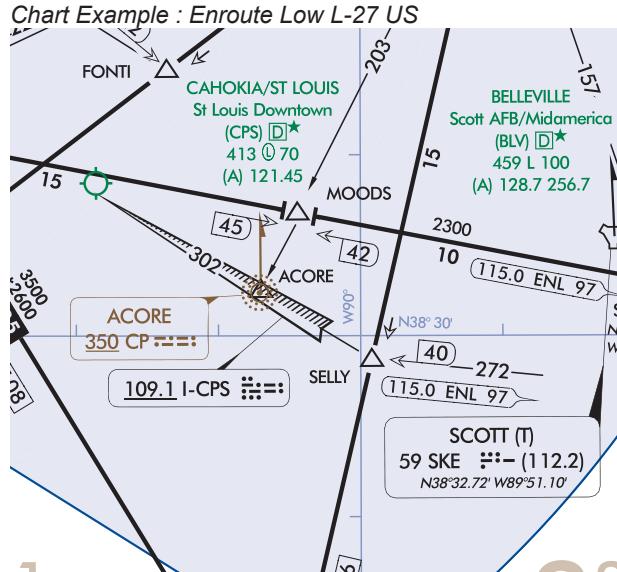
LF/MF



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

Compass Locator Beacon

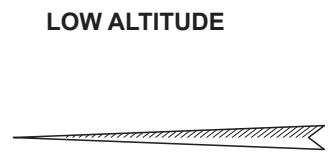
LOW ALTITUDE



RADIO AIDS TO NAVIGATION (Continued)

ILS LOCALIZER

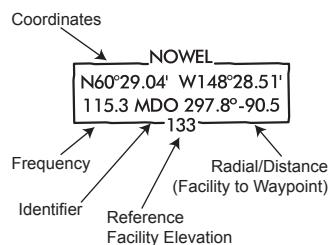
ILS Localizer Course with additional navigation function



ILS Localizer Back Course with additional navigation function

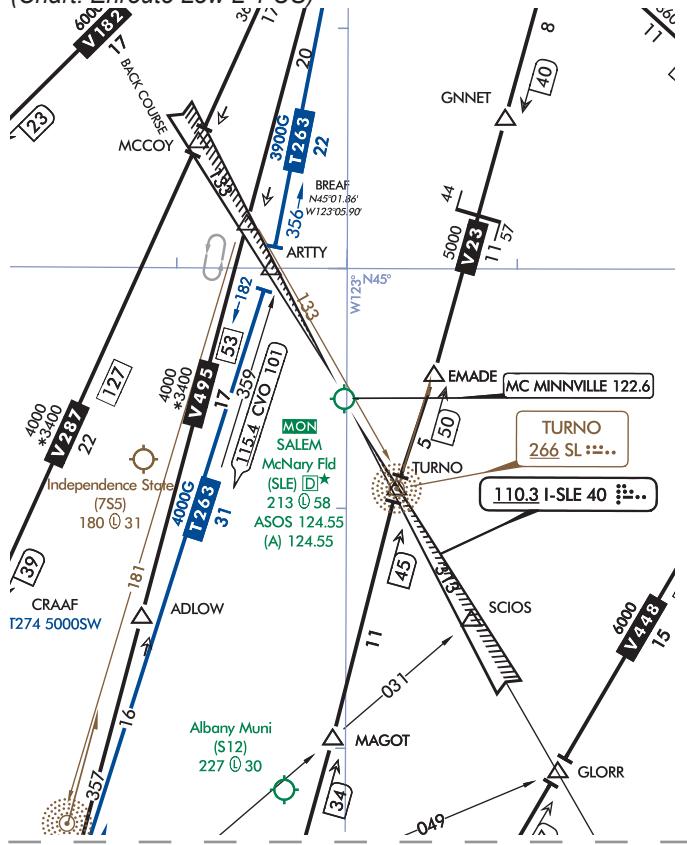


HIGH ALTITUDE - ALASKA VOR/DME RNAV WAYPOINT DATA



ILS Localizer Example with Back Course

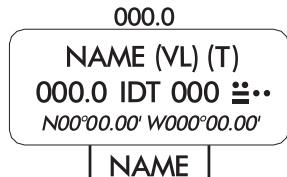
(Chart: Enroute Low L-1 US)



NAVIGATION AND COMMUNICATION BOXES - COMMON ELEMENTS

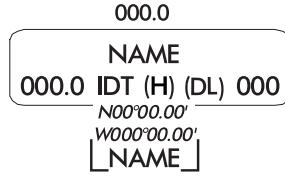
LOW ENROUTE CHARTS

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



HIGH ENROUTE CHARTS

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



COMMON ELEMENTS (HIGH AND LOW CHARTS)

RCO Frequency

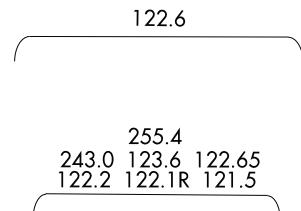
Single Frequency

Multiple Frequencies

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

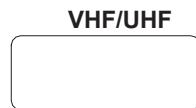
R - Receive Only

T - Transmit Only



NAVAID Box

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



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



RADIO AIDS TO NAVIGATION (Continued)

Navigation and Communication Boxes - Common Elements

NAVAID STANDARD SERVICE VOLUME (SSV) CLASSIFICATIONS

(VL), (T), etc. indicate SSV. See "NAVAID STANDARD SERVICE VOLUME (SSV) CLASSIFICATIONS" on page 64 or the Chart Supplement for SSV Altitude and Range Boundaries.

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

DISTANCE MEASURING EQUIPMENT

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

(Y)

VOICE COMMUNICATIONS VIA NAVAID

Voice Transmitted

112.6

No Voice Transmitted

111.0

NAVAID SHUTDOWN STATUS

VHF/UHF

LF/MF

PART TIME OR ON-REQUEST

VHF/UHF

LF/MF

AUTOMATED WEATHER BROADCAST SERVICES

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

VHF/UHF LF/MF

A

A

LATITUDE AND LONGITUDE

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

LOW ENROUTE

N00°00.00' W000°00.00'

HIGH ENROUTE

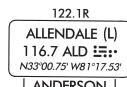
N00°00.00' W000°00.00'

Navigation and Communication Boxes - Examples

LOW ENROUTE CHARTS

VOR

R - Receive only 122.1R



Controlling FSS Name - ANDERSON

(T) - Service Volume



Receive & Transmit on 122.35

(T) - Service Volume

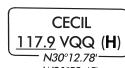
Latitude and Longitude

Controlling FSS Name - MACON



HIGH ENROUTE CHARTS

VOR



RADIO AIDS TO NAVIGATION (Continued)

Navigation And Communication Boxes - Examples (Continued)

LOW ENROUTE CHARTS

VOR/DME

No Voice Communications
(Y) Mode DME

SAWMILL (H)(H)
113.75 SWB 84(Y) 

R - Receive only 122.1R
Controlling FSS Name - BUFFALO

122.1R
ROCKDALE (L)(L)
112.6 RKA 73 
N42°27.98' W75°14.36'
[BUFFALO]

Shadow NAVAID Box
FSS Associated with NAVAID

119.1
MIRABEL (L)(L)
116.7 YMX 114 
N45°33.30' W74°22.54'

TACAN

TACAN Channels are without
voice but not underlined

SANTA ROSA (L)
63 NGS 
N30°36.91' W86°56.24'

Part Time NAVAID

PENSACOLA (L)
*119 NPA 
N30°21.48' W87°18.99'

VORTAC

255.4 243.0 122.55 121.5
ALEXANDRIA (H)(H)
116.1 AEX 108 
N31°15.40' W92°30.06'
[DE RIDDER]

Shutdown status

BRUNSWICK (L)(L)


N43°24.11' W69°55.31'

DME

DME Channel, Ident, Morse Code,
VHF Frequency

MOLITRIE (L)
25 MGR 
N31°04.94' W83°48.25'

NDB

A - ASOS/AWOS Available

SILVER BAY 
350 BFW 

Shutdown status

SHEMYA 
SYA 
N52°43.32' E174°03.62'

NDB/DME

No Voice Communications
(Y) Mode DME

122.3
CAPE LISBURNE
385 LUR 20(Y) (108.35) 
N68°52.28' W166°04.56'
[KOTZEBUE]

Shadow NAVAID Box
FSS Associated with NAVAID

123.6
ILIAMNA
411 ILL 91 (114.4) 
N59°44.88' W154°54.58'

HIGH ENROUTE CHARTS

VOR/DME

Off Route (Greyed NAVAID Box
and NAVAID)

ITHACA
111.8 ITA (L)(D) 55

DME in Y Mode

ELMIRA
109.65 ULV (L)(L) 33(Y)
N42°05.65'
W77°01.49'

Shadow NAVAID Box
FSS Associated with NAVAID

MIRABEL
116.7 YMX (L)(L) 114
N45°33.30'
W74°22.54'

TACAN

Off Route

TYNDALL
64 PAM (H) (133.7)
N30°04.44'
W85°34.34'

Off Route - Part Time NAVAID
(Greyed NAVAID Box and NAVAID)

PENSACOLA
119 NPA (L) (117.2)
N30°21.48'
W87°18.99'

VORTAC

122.55
ALEXANDRIA
116.1 AEX (H)(H) 108
N31°15.40'
W92°30.06'
[DE RIDDER]

Off Route (Greyed NAVAID Box
and NAVAID)

HANDLE
114.3 HLL (L) (D) 90

DME

DME Channel, Ident, Morse Code,
VHF Frequency

DUNKIRK
109 DKK (H) (116.2)

NDB

FORT DAVIS
529 FDV
N64°29.68'
W165°18.91'

NDB/DME

No Voice Communications
(Y) Mode DME

CAPE NEWENHAM
385 EHM 18(Y) (108.15)
N58°39.36'
W162°04.42'

Shadow NAVAID Box
FSS Associated with NAVAID

ILIAMNA
411 ILL 91 (114.4)

Notes: Morse Code is not shown on High NAVAID Boxes.

RADIO AIDS TO NAVIGATION (Continued)

Stand Alone Flight Services and Communication Outlets

Flight Service Station (FSS)

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

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

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

R - Receive Only
T - Transmit Only

LOW CHARTS

Stand Alone FSS



HIGH CHARTS

Stand Alone FSS



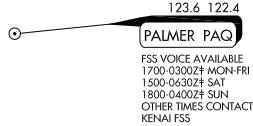
Stand Alone FSS Associated with an Airport



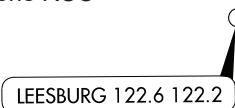
Stand Alone FSS Associated with an Airport



Part-time FSS



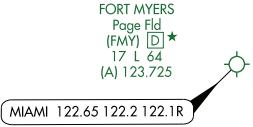
Stand Alone RCO



Stand Alone RCO



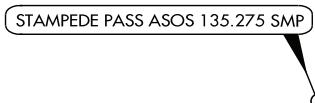
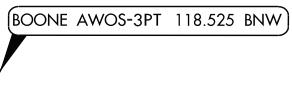
RCO Associated/Co-located with RCO Associated/Co-located with an Airport



Remote Communications Outlet (RCO)

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

Stand Alone AWOS & ASOS



AIRSPACE INFORMATION

Airway/Route Types

Low and High Enroute Airway Data:

Low Enroute Charts	
Victor Airways	
LF/MF Airway	
RNAV T Route	
GNSS Required	
RNAV TK Helicopter Route	
GNSS Required	

Preferred Direction Victor Route	
Unusable Route Segment	

Military Training Routes (MTR)	
MTRs 5NM or less both sides of centerline	
MTRs greater than 5NM either or both sides of centerline	

Arrow indicates direction of route

See MTR tabulation for altitude range information

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

CAUTION: Inset charts do not depict MTRs

VHF/UHF Data is depicted in Black.

LF/MF Data is depicted in Brown.

RNAV Route data is depicted in Blue

High Enroute Charts	
Jet Routes	
Atlantic Routes	
Bahama Routes	
RNAV Q Routes	
Alaska Q Routes require GNSS and radar surveillance. Within the CONUS, GNSS or DME/DME/IRU RNAV required, unless otherwise indicated. DME/DME/IRU aircraft require radar surveillance.	
Preferred Direction Jet Routes	
Preferred Direction RNAV Q Routes	
Preferred Direction ATS Route	
Unusable Route Segment	

Low and High Enroute Charts

ATS Route	
Oceanic Route	

Substitute Route

All relative and supporting data shown in brown.

See NOTAMs or appropriate publication for specific information.

Airspace Information (Continued)

FIXES			REPORTING FUNCTION	WAYPOINTS
VHF/UHF			Compulsory Position Reporting	RNAV
			Non-Compulsory Position Reporting	
			Fix or Waypoint Coordinates <i>Fix Coordinates are shown for compulsory, offshore and holding fixes.</i>	<i>N44°25.36' W64°11.00'</i>
			<i>Waypoints Coordinates are shown when waypoint is not part of a RNAV route and when located on or beyond the boundary of the U.S. Continental Control (12 mile limit).</i>	
			Off-set arrows indicate facility forming a fix <ul style="list-style-type: none">- Arrow points away from the VHF/UHF NAVAID- Arrow points towards the LF/MF NAVAID	N/A
			Distance Measuring Equipment (DME) Fix <i>Denotes DME fix (distance same as airway / route mileage)</i>	N/A
VHF/UHF			Distance Measuring Equipment (DME) Fix	RNAV N/A
			<i>Denotes DME fix (encircled mileage shown when not otherwise obvious)</i>	
			Example: <i>First segment, 5NM; second segment 10NM; total mileage provided in encircled DME arrow.</i>	N/A
VHF/UHF	 5	 10	 15	
LF/MF	 229	 149		
			Total Mileages between Compulsory Reporting Points or NAVAIDs	RNAV N/A
			<i>Note: All mileages are in Nautical Miles</i>	
54		125		125
				
			MILEAGE BETWEEN OTHER FIXES, NAVAIDs AND/OR MILEAGE BREAKDOWN	
			Mileage Breakdown or Computer Navigation Fix (CNF) <i>Five letter identifier in parentheses indicates CNF with no ATC function</i>	N/A
			FACILITY LOCATOR BOATS	N/A
			<i>Crosshatch indicates Shutdown status of NAVAID</i>	
			RADIAL OUTBOUND FROM A VHF/UHF NAVAID	N/A
			<i>All Radials are magnetic.</i>	
			BEARING INBOUND TO AN LF/MF NAVAID	N/A
			<i>All Bearings are magnetic.</i>	
N/A				
N/A		N/A		
			MAGNETIC REFERENCE BEARING , outbound from a NAVAID or Fix <i>Note: Not shown on joint Victor/RNAV or Jet/RNAV Routes.</i>	000→

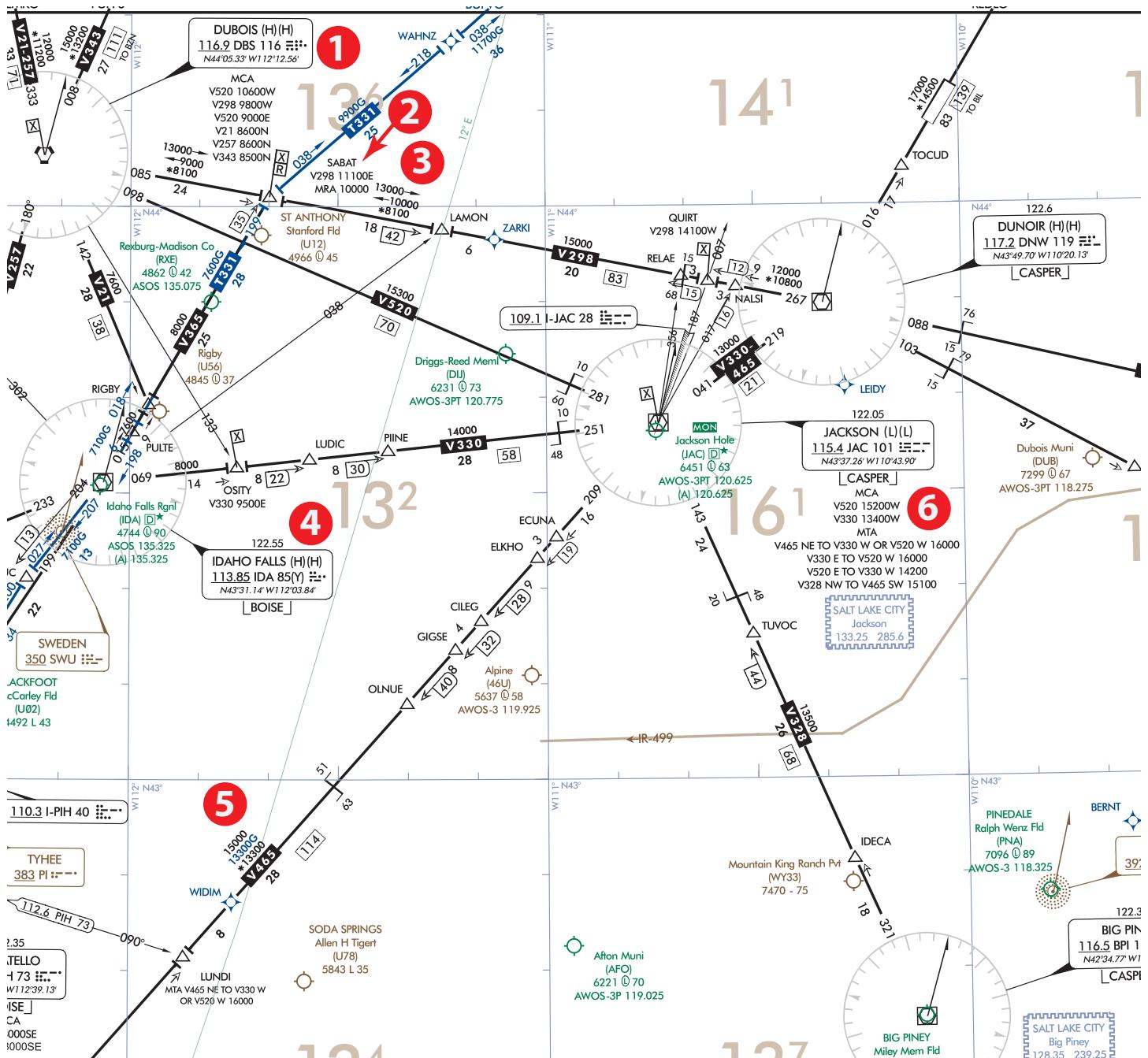
Airspace Information (Continued)

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

AIRSPACE INFORMATION (Continued)

Enroute Chart Examples

Low Enroute Chart



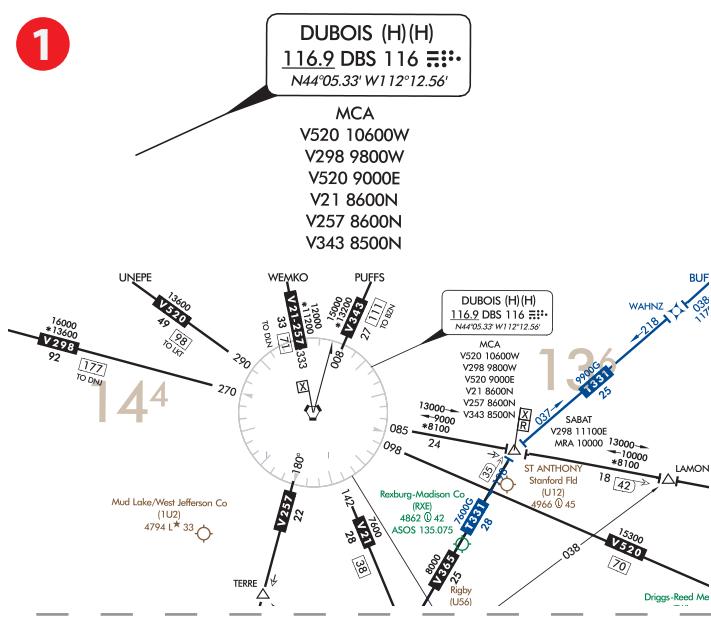
AIRSPACE INFORMATION (Continued)

Enroute Chart Examples

Low Enroute Chart (Continued)

Reference Number

1



AIRSPACE INFORMATION (Continued)

Enroute Chart Examples

Low Enroute Chart (Continued)

Reference Number

Description

5

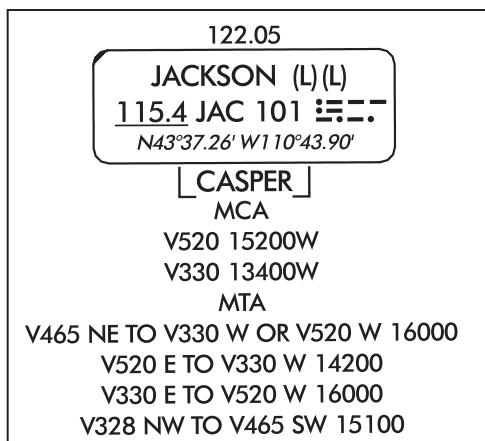


MEA VHF and RNAV Example

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

MOCA of 13300'

6



MCA and MTA Example at a NAVAID

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

MTA for aircraft crossing over and turning at JAC:

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

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

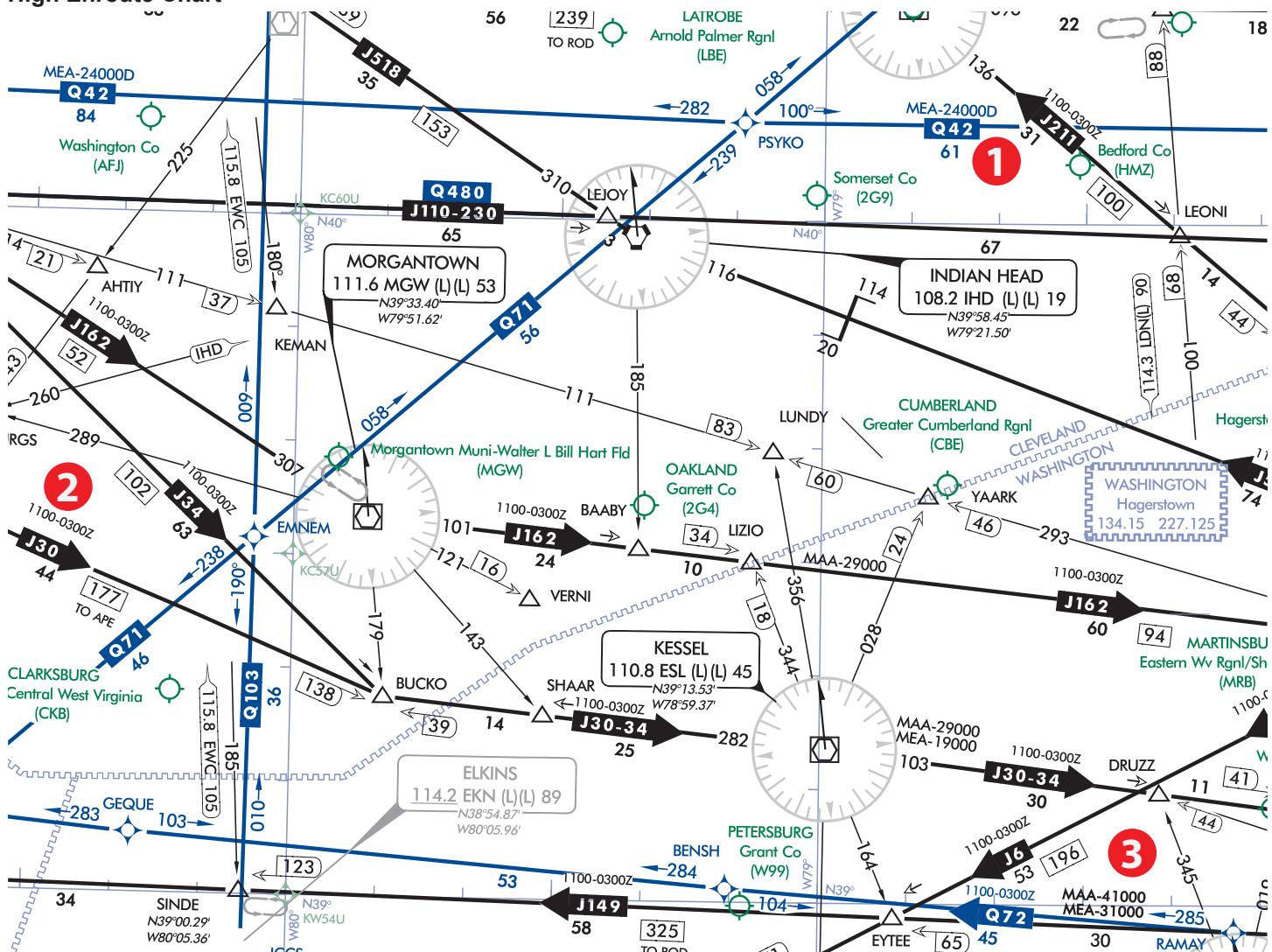
Aircraft traveling E on V330 and turning to V520 on a W heading must turn at altitude of 16000' or higher

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

Airspace Information (Continued)

Enroute Chart Examples

High Enroute Chart

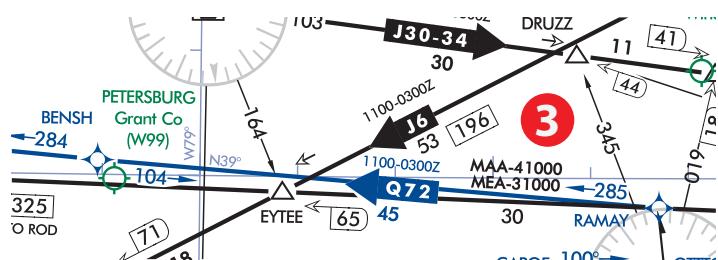


AIRSPACE INFORMATION (Continued)

Enroute Chart Examples

High Enroute Chart (Continued)

Reference Number



Description

Preferred Directional Jet Route with Time Restrictions, MAA and MEA

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

AIRSPACE BOUNDARIES

Air Defense Identification Zone (ADIZ)

LOW / HIGH CHARTS



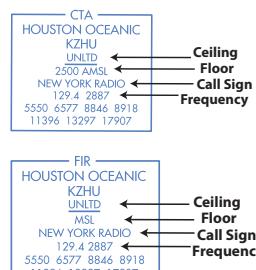
Air Route Traffic Control Center (ARTCC)

LOW / HIGH CHARTS



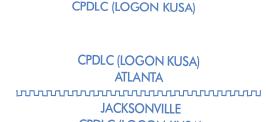
Air Traffic Service Identification Data

LOW / HIGH CHARTS



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

LOW / HIGH CHARTS



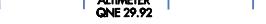
Flight Information Regions (FIR)

LOW / HIGH CHARTS



Altimeter Setting Change

LOW / HIGH CHARTS



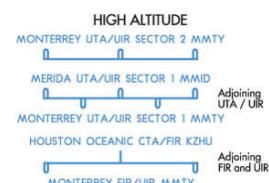
Upper Information Regions (UIR)

Control Areas (CTA)

LOW / HIGH CHARTS



Upper Control Areas (UTA)



Adjoining CTA

Additional Control Areas

LOW ALTITUDE

LOW / HIGH CHARTS



HIGH ALTITUDE

LOW / HIGH CHARTS



Foreign Airspace Note

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

AIRSPACE INFORMATION (Continued)

Airspace - U.S.

Class A	Open Area (White)
<i>High Chart Only</i>	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.
<i>Controlled Airspace</i>	That airspace from 18,000' MSL to and including FL 450, including Santa Barbara Island, Farallon Island, the Alaska peninsula west of longitude 160°00'00" W, and designated offshore areas.

Class B

Low Chart Only

Controlled Airspace



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

Mode C Area

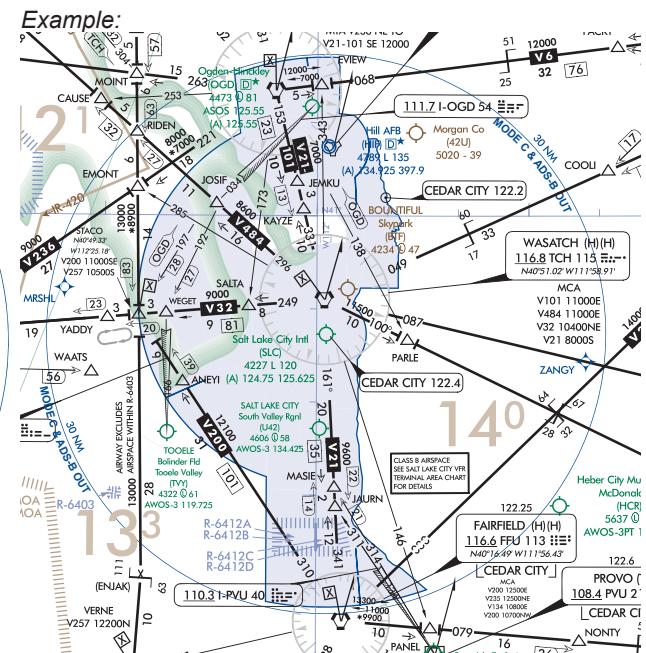
LITERATURE

Controlled Airspace

A Solid Blue Outline

Example:

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



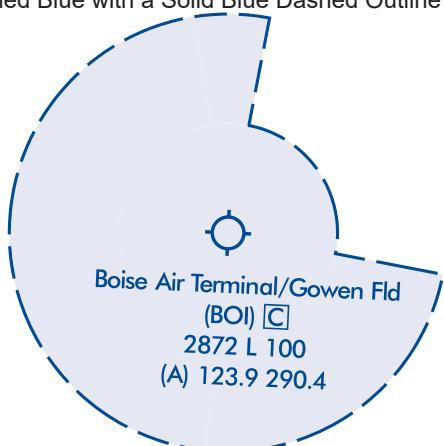
AIRSPACE INFORMATION (Continued)

Airspace - U.S. (Continued)

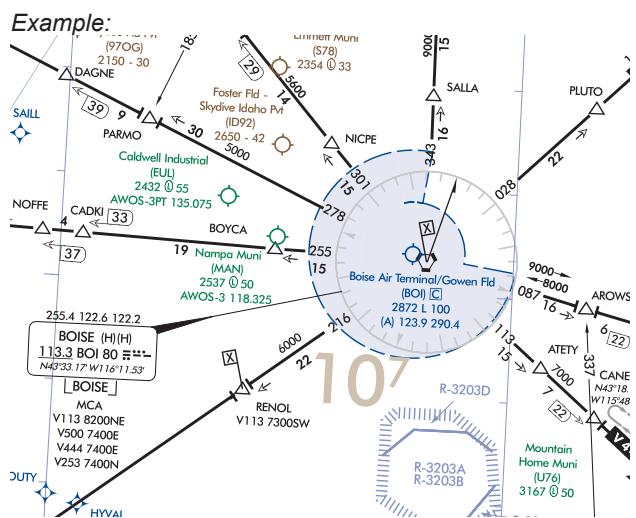
CLASS C Screened Blue with a Solid Blue Dashed Outline

Low Chart Only

Controlled Air-space



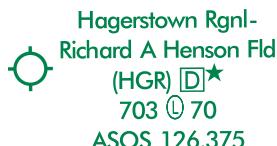
That airspace from the surface to 4,000' (unless otherwise designated) above the elevation of selected airports (charted in MSL). The normal radius of the outer limits of Class C airspace is 10NM. Class C airspace is also indicated by the letter C in a box following the airport name.



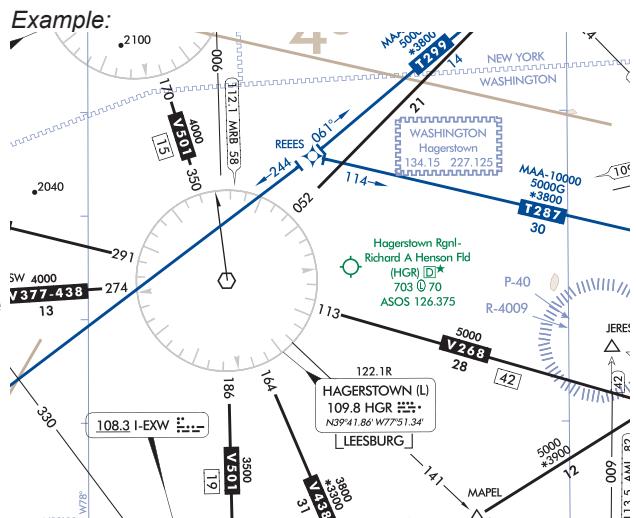
CLASS D Open Area (White)

Low Chart Only

Controlled Air-space



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



Airspace Information (Continued)

AIRSPACE - U.S.

CLASS E

Open Area (White)

Low Chart Only

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

Controlled Air-

space

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

Other designated control areas below 14,500' MSL.

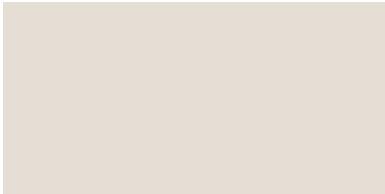
Not Charted

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

CLASS G

High and Low Chart

Screened Brown Area



Uncontrolled Airspace

Low Altitude

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

High Altitude

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

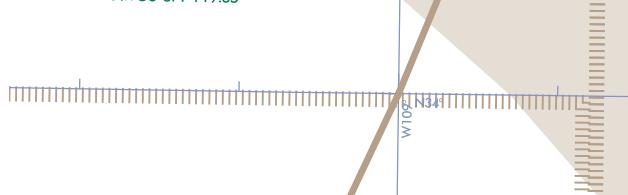
Example:

IBUQUERQUE
Zuni
14.325 288.25

122.1R

ST JOHNS (H)(H)
112.3 SJN 70
N34°25.44' W109°08.61'
PREScott

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

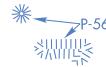


AIRSPACE INFORMATION (Continued)

Special Use Airspace - U.S.

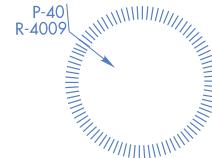
Low and High Charts P - Prohibited Area

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



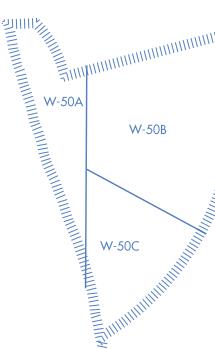
R - Restricted Area

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



W - Warning Area

Example: W-50



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

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

Low Charts Only

A - Alert Area

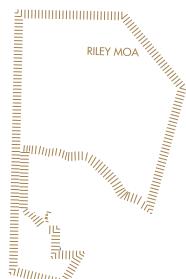
* Alert Areas do not extend into Class A, B, C and D airspace, or Class E airport surface areas.



MOA - Military Operations Area

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

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



AIRSPACE INFORMATION (Continued)

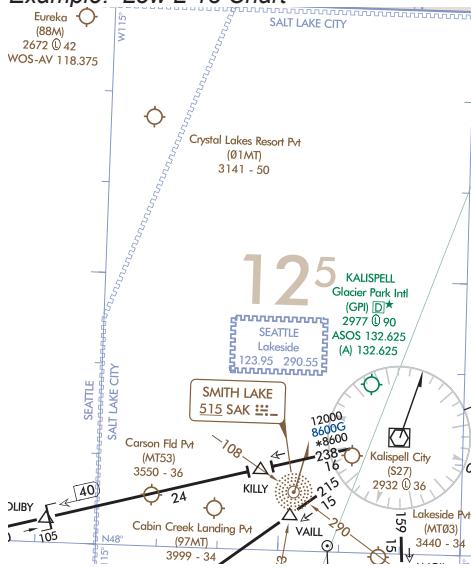
Off Route Obstruction Clearance Altitude (OROCA)

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

Example: 12,500 feet

12⁵

Example: Low L-13 Chart



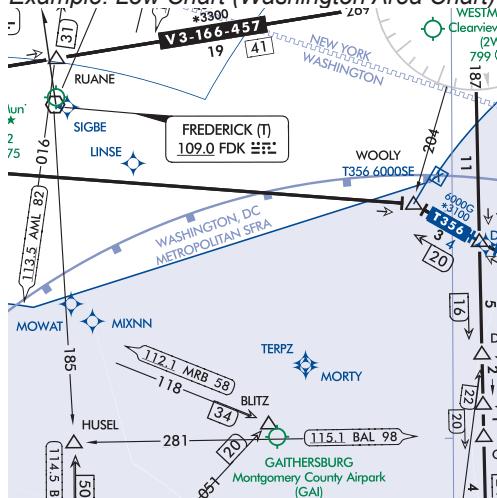
Special Flight Rules Area (SFRA)

Low and High Charts

SFRA Symbology



Example: Low Chart (Washington Area Chart)



Example: High Chart (H-12)



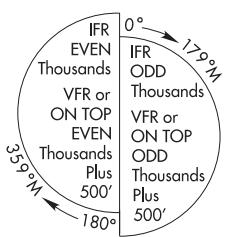
NAVIGATIONAL AND PROCEDURAL INFORMATION

Cruising Altitudes - Low Charts - U.S. Only

IFR outside controlled airspace.

IFR within controlled airspace as assigned by ATC.

ALL courses are magnetic.



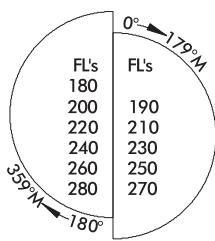
VFR above 3000' AGL
unless otherwise
authorized by ATC.

Cruising Altitudes - High Charts - U.S. Only

IFR within controlled airspace as assigned by ATC

All courses are magnetic.

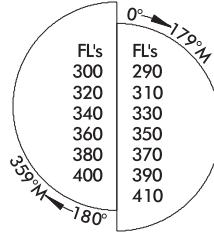
18,000' MSL to FL280



VFR or VFR On Top
add 500'

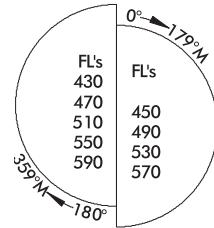
No VFR flights within
Class A Airspace above
3000' AGL unless
otherwise authorized

RVSM Levels FL290 to FL410



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

FL430 and above



Navigational and Procedural Information (Continued)

ISOGONIC LINE AND VALUE

LOW/HIGH CHARTS

TIME ZONE

All time is Coordinated Universal Time (UTC)

Mountain Std
+7 = UTC

Central Std
+6 = UTC

ENLARGEMENT AREA



MATCH MARK

LOW/HIGH CHARTS



MORSE CODE

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

CULTURE

Boundaries

International

LOW/HIGH ALTITUDE

— (Not shown when coincident with ARTCC or FIR)

Date Line

LOW/HIGH ALTITUDE

INTERNATIONAL DATELINE

SUNDAY
MONDAY

U.S./Russia Maritime Line

LOW/HIGH ALTITUDE

+ + RUSSIA
UNITED STATES + +

HYDROGRAPHY

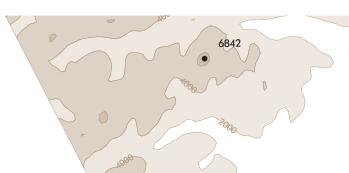
SHORELINES



TOPOGRAPHY

TERRAIN

Area Charts



U.S. TERMINAL PROCEDURES PUBLICATION

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

EXPLANATION OF TPP TERMS AND SYMBOLS

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

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

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

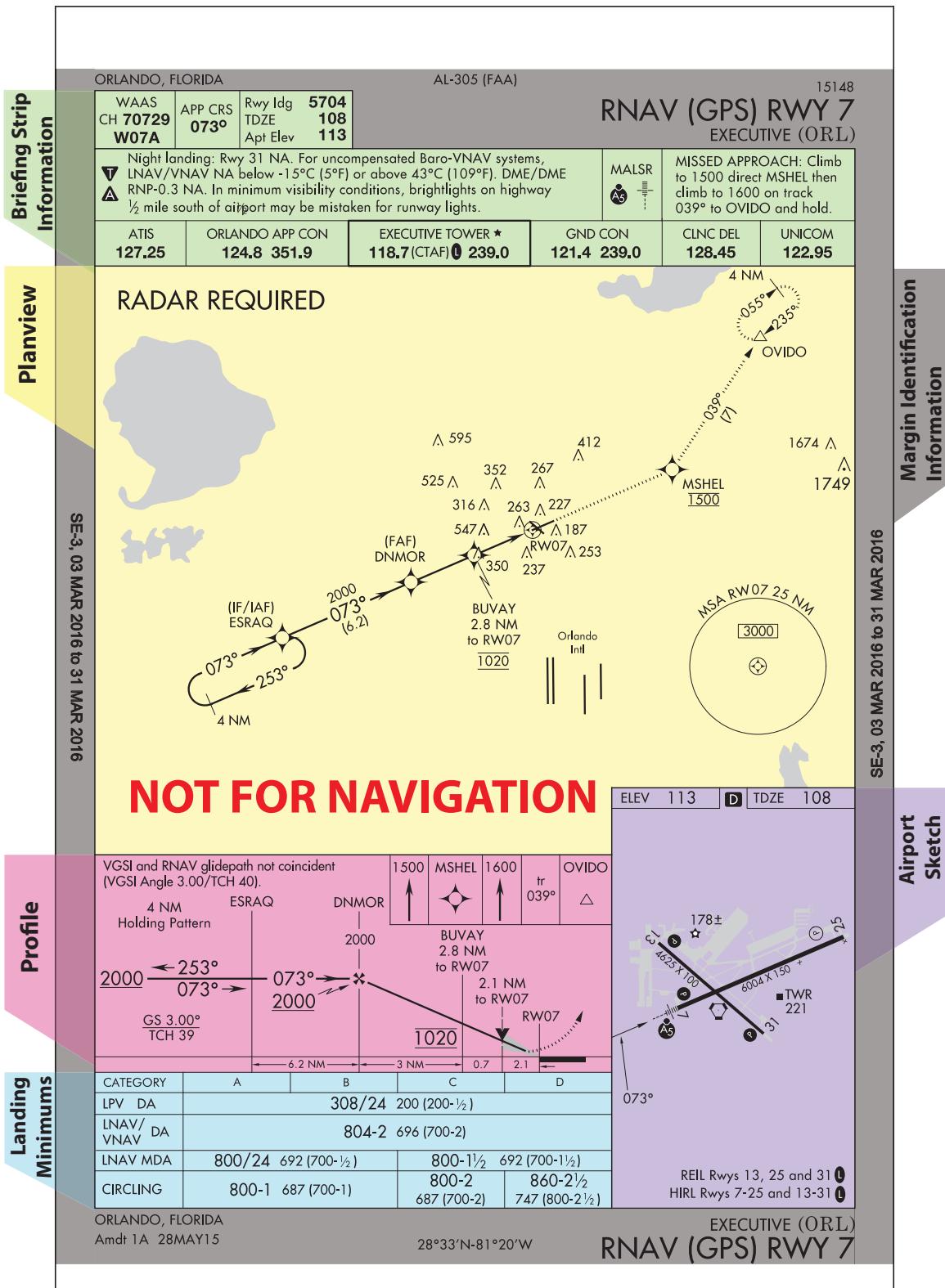
- Instrument Approach Procedure (IAP) Charts
- Airport Diagrams
- Departure Procedures (DP)
- Standard Terminal Arrival (STAR) Charts
- Charted Visual Flight Procedure (CVFP) Charts

INSTRUMENT APPROACH PROCEDURE CHART

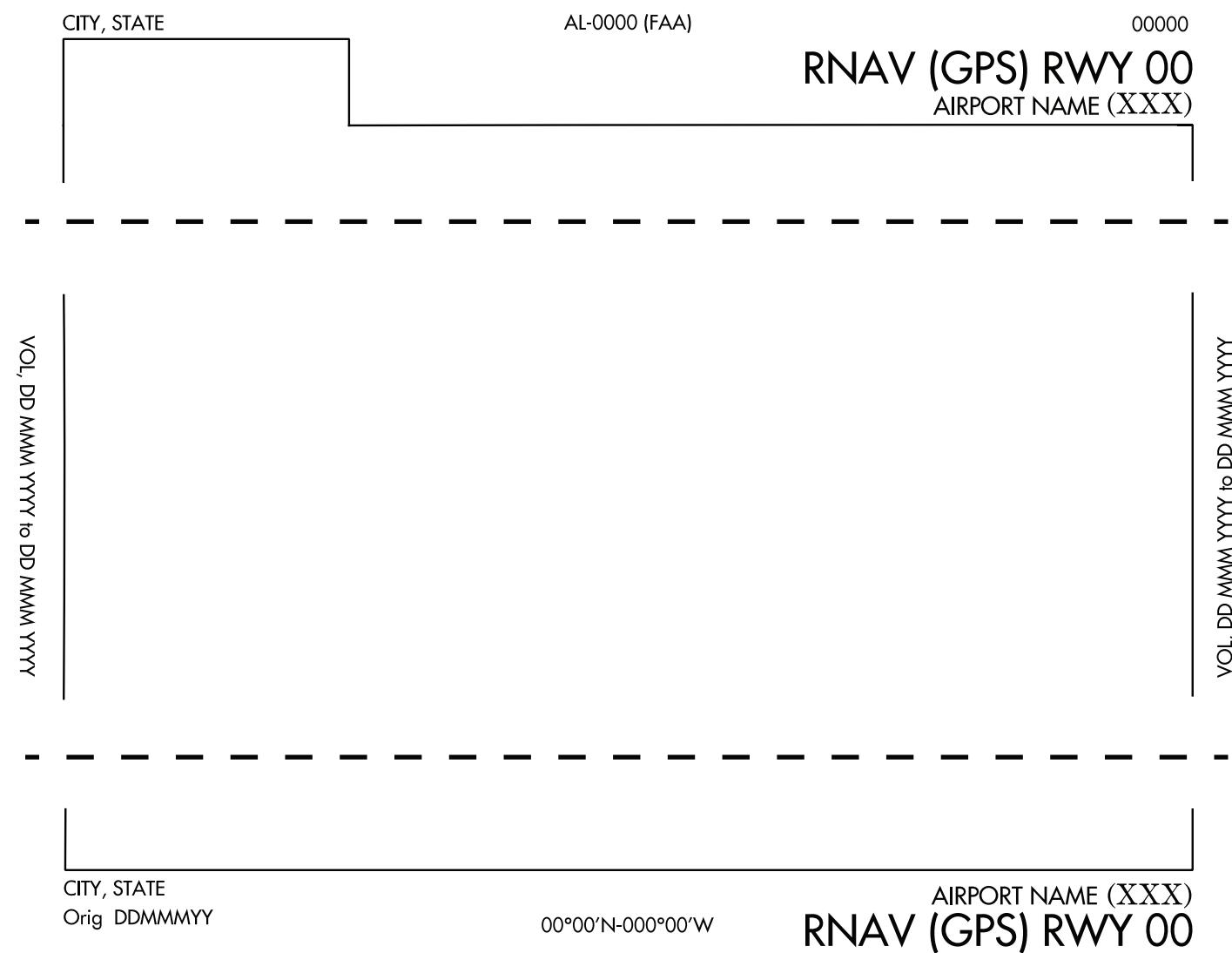
The IAPs (charts) are divided into various sections:

Margin Identification Information
Briefing Strip Information
Planview
Missed Approach Information

Profile View
Landing Minimums
Airport Sketch



Margin Identification Information



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

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



Top Margin Information:

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

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

WASHINGTON, DC	AL-5326 (FAA)	15344
WAAS CH 56239 W34B	APP CRS 326°	Rwy Idg 3715 TDZE 182 Apt Elev 192

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

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

The airport name is shown on both the top and bottom margins below the procedure title. The airport identifier is shown in parentheses following the airport name. Airports outside the contiguous United States will be shown with the FAA designated identifier followed by the ICAO location identifier.

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

WASHINGTON, DC	AL-5326 (FAA)	15344
WAAS CH 56239 W34B	APP CRS 326°	Rwy Idg 3715 TDZE 182 Apt Elev 192

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

15344
Year|Day of Year

Side Margin Information:

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

Bottom Margin Information:

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

Example: Original Procedure Date

WASHINGTON, DC
Orig 10DEC15

MANASSAS RGNL/HARRY P DAVIS FLD (HEF)
38°43'N-77°31'W

RNAV (GPS) RWY 34L

Example: Amendment Procedure Date

WASHINGTON D.C.
Amdt 1B 28MAY15

MANASSAS RGNL/HARRY P DAVIS FLD (HEF)
38°43'N-77°31'W RNAV (GPS) RWY 16R

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

BRIEFING STRIP INFORMATION

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

WASHINGTON, DC	AI-443 (FAA)	15288
LOC/DME I-DCA APP CRS Top Briefing Strip Chan 36	Rwy Idg 6869 14 15 Apt Elev	
		ILS or LOC/DME RWY 1 RONALD REAGAN WASHINGTON NTL (DCA)
ATIS 132.65	POTOMAC APP CON 119.85 124.2 269.0 (EAST)	ALSF-2 MISSED APPROACH: Climb to 420 then climbing left turn to 2100 on DCA VOR/DME R-325 to GTN NDB/INT/DCA 5.9 DME and hold

Top Briefing Strip

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



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

Top Briefing Strip Examples:

Ground based NAVAID:

DENVER, COLORADO	16147
LOC/DME I-DZG 111.55 Chan 52(Y)	APP CRS 082°

ILS or LOC RWY 7
DENVER INTL (DEN)

RNAV-WAAS:

DENVER, COLORADO					
WAAS CH 82628 W16B	APP CRS 173°	Rwy Idg 16000 TDZE 5326 Apt Elev 5434			

16147

RNAV (GPS) Y RWY 16R
DENVER INTL (DEN)

GBAS:

NEWARK, NEW JERSEY					
GBAS CH 22727 G04A	APP CRS 039°	Rwy Idg 8460 TDZE 10 Apt Elev 17			

AL-285 (FAA)

18256

GLS RWY 4L
NEWARK LIBERTY INTL (EWR)

No Primary NAVAID box:

DENVER, COLORADO					
APP CRS 173°	Rwy Idg 12000 TDZE 5339 Apt Elev 5434				

16147
RNAV (RNP) Z RWY 17L
DENVER INTL (DEN)

Circling Approach:

ROANOKE, VIRGINIA					
VOR ODR 114.9	APP CRS 236°	Rwy Idg N/A TDZE N/A Apt Elev 1175			

AL-349 (FAA)

16203

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

Sidestep Procedure:

LOS ANGELES, CALIFORNIA					
LOC/DME I-OSS 108.5 Chan 22	APP CRS 251°	Rwy Idg 8925 TDZE 120 Apt Elev 126	24R	24L	

AL-237 (FAA)

16315

ILS or LOC RWY 24R
LOS ANGELES INTL (LAX)

Middle Briefing Strip

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

1

2

3

NOTES BOX	APPROACH LIGHTING SYSTEM	MISSED APPROACH PROCEDURE TEXT BOX
-----------	--------------------------------	---------------------------------------

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

Notes Box

Procedure Equipment Requirements Notes Box

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

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

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

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

Notes Symbols

Several different symbols may appear within the Notes Box:

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

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

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

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

Bottom Briefing Strip (Communications Information)

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

ATIS XXXXX	APP CON XXXX XXXX	TOWER XXXX XXXX	GND CON XXXXX	CLNC DEL XXXXX	UNICOM XXXXX
---------------	-----------------------------	---------------------------	------------------	-------------------	-----------------

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

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

PLANVIEW

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

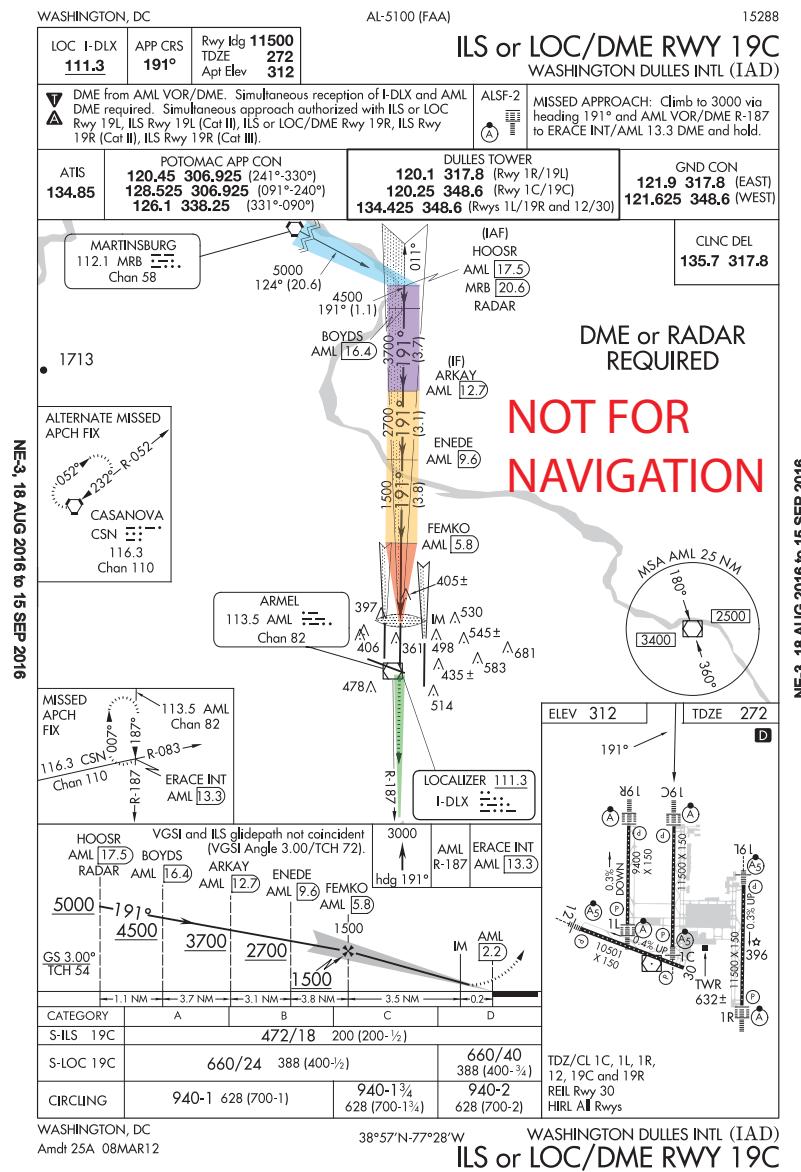
The data on the planview is shown to scale, unless concentric rings, scale breaks or an inset have been used.

Planview Items

Approach Segments	Hydrography
NAVAIDs	International Boundary
Area Navigation (RNAV) Waypoints	Obstacles (Man-made, Terrain and Vegetation)
Restrictive Airspeeds	Special Use Airspace
Restrictive Altitudes	Minimum Safe Altitude
Holding Patterns and Procedure Turns	Terminal Arrival Areas
Airports	Helicopter (Copter) Procedures
Relief (Terrain Features)	

Approach Segments

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



Simple IAP Example

Legend



Feeder Route



Initial Approach



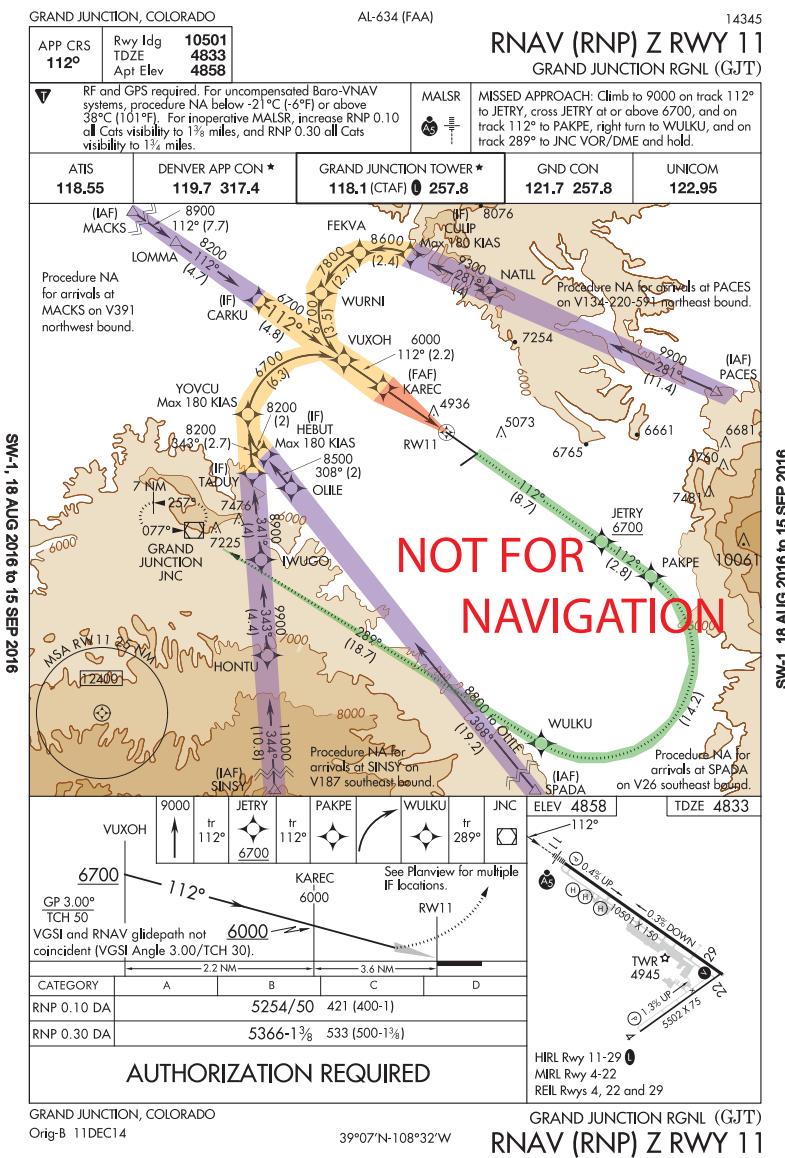
Intermediate Approach



Final Approach Course

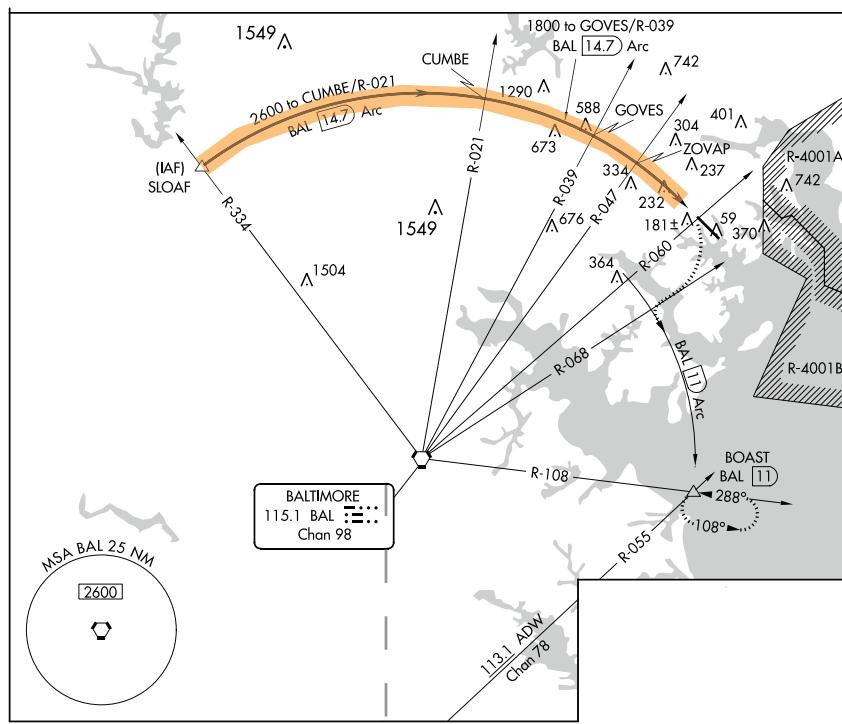


Missed Approach



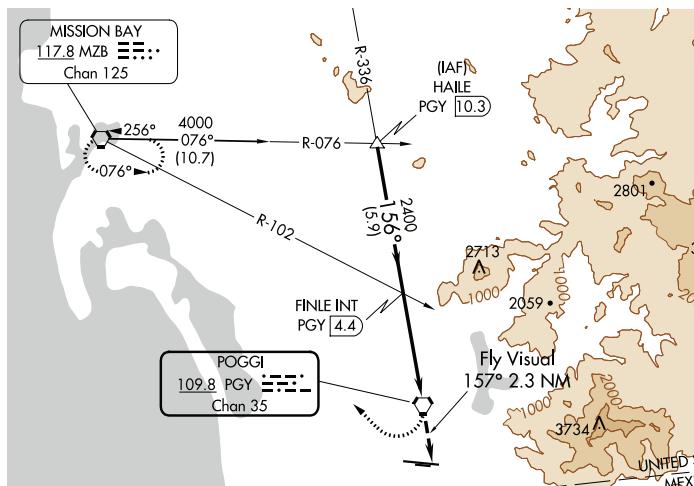
Complex IAP Example with RF Legs

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

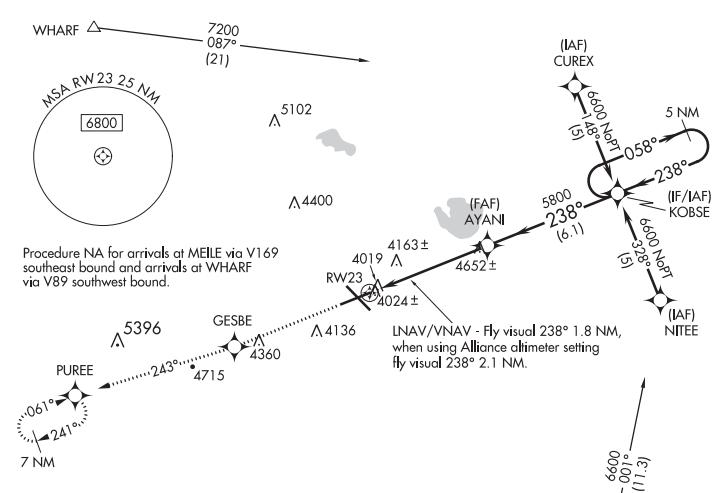


- Visual segment** - Instrument approach procedures, including Copter approach procedures, that terminate or have missed approaches prior to the airport/heliport, and are authorized to proceed visually, will depict the visual flight path by a dashed line symbol from the missed approach point to the airport.

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



Traditional (NAVAID) Approach

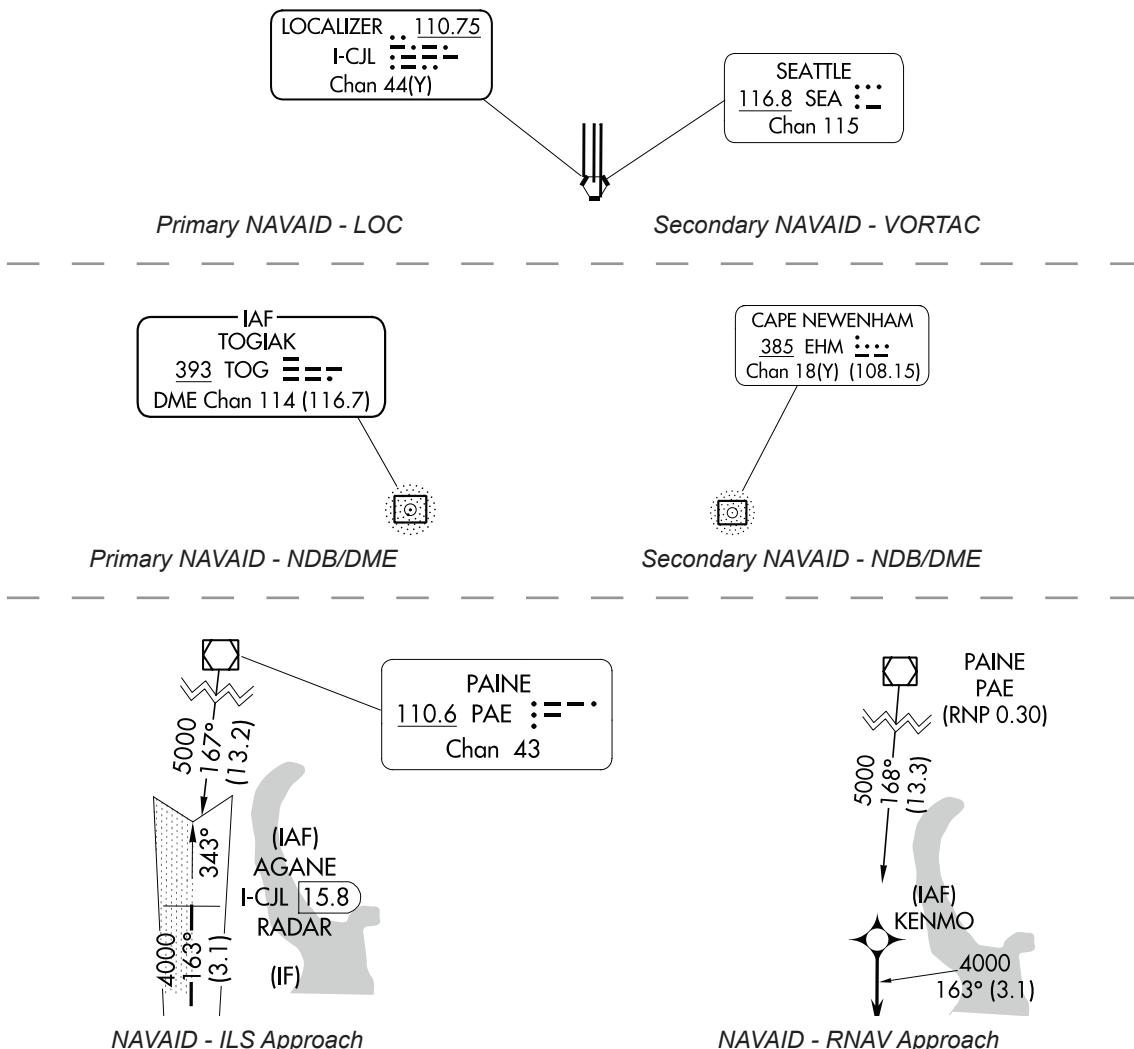


RNAV Approach

NAVAIDs

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

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



Area Navigation (RNAV) Waypoints

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



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



Localizer Depiction

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



Restrictive Airspeed

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

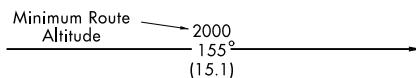
Type	Description	Example
Recommended Speed	Recommended speed is depicted with no lines above or below it	180K
Minimum Speed	Minimum speed is depicted as a number with a line below it	120K
Maximum Speed	Maximum speed is depicted as a number with a line above it	250K
Mandatory Speed	Mandatory speed is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

Altitudes

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

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

Altitudes that are shown along a route are minimum altitudes.

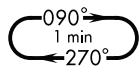


Holding Patterns and Procedure Turns

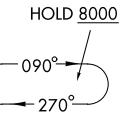
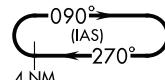
Holding Patterns are used for many reasons, including deteriorating weather or high traffic volume. Holding might also be required following a missed approach. Each holding pattern has a fix, a direction to hold from the fix, and an airway, bearing, course, radial, or route on which the aircraft is to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



Missed Approach



Hold In-Lieu of Procedure Turn

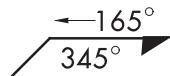


Arrival

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

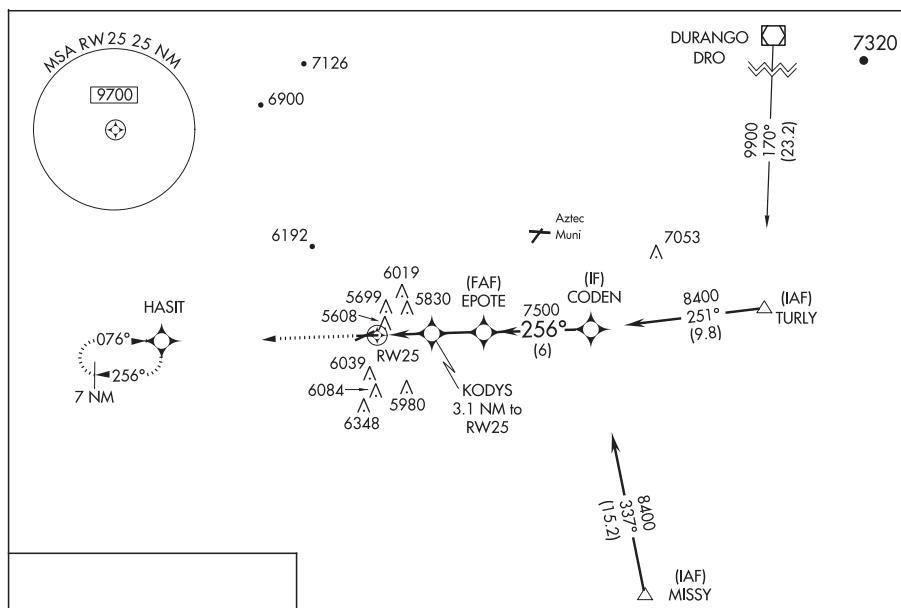
Waypoints designated as a holding fix are shown as fly-by, without the circle around the symbol. However, in the event the holding fix/waypoint is also designated in all other parts of the procedure unrelated to holding with a fly-over function, then the holding fix/waypoint will be charted as a fly-over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

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



Airports

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

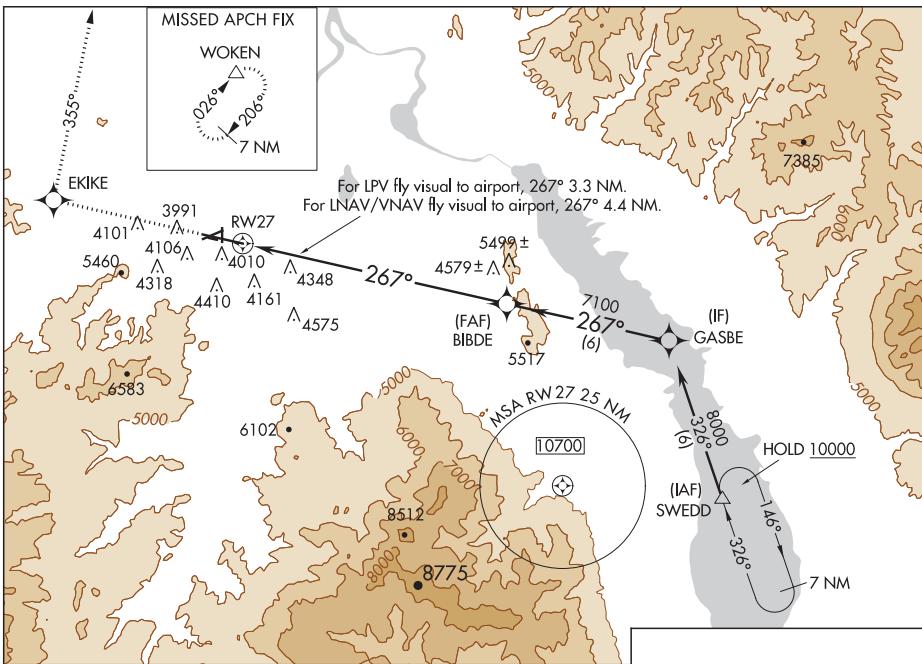


Relief (Terrain Features)

Terrain is depicted in the planview portion of all IAPs at airports that meet the following criteria:

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

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



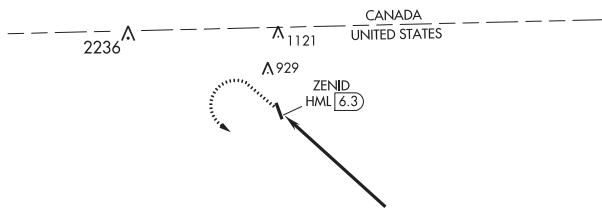
Hydrography (Water)

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

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

International Boundary

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

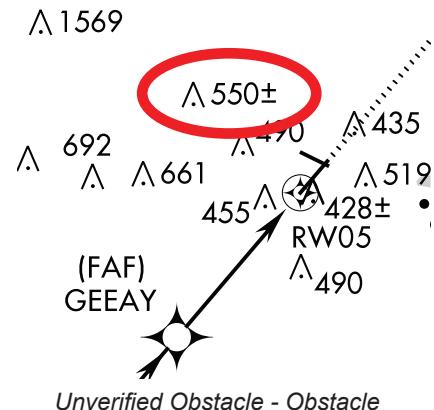
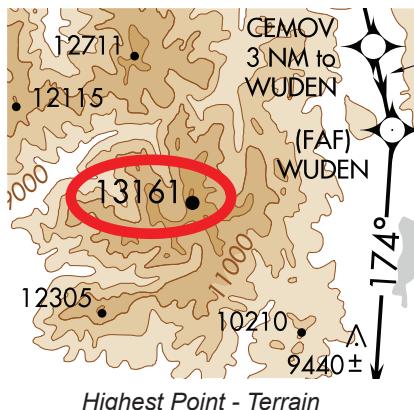
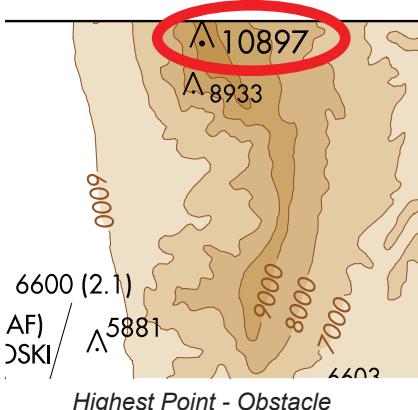


Obstacles (Man-made, Terrain and Vegetation)

Obstacles are shown as when they are man-made or vegetation or as a when they are terrain. The highest obstacle, whether man-made or terrain is depicted with a bolder and larger symbol along with larger elevation font size. Any obstacle that penetrates a slope of 67:1 emanating from any point along the centerline of any runway shall be considered for charting within the area shown to scale. Obstacles specifically identified by the approving authority for charting shall be charted regardless of the 67:1 requirement.

Unverified obstacles shall be indicated by a doubtful accuracy symbol following the elevation value.

On non-precision approaches, obstacles should be considered when determining where to begin descent from the MDA.

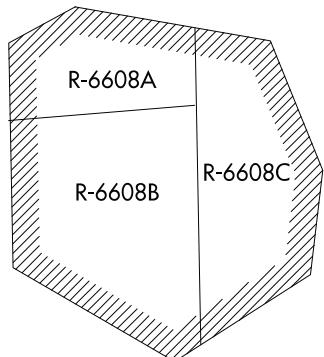


Special Use Airspace (SUA)

SUAs consist of that airspace wherein activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of those activities, or both. These are prohibited areas, restricted areas, warning areas, Military Operations Areas (MOAs), and alert areas. SUA that falls within the area of coverage of the instrument approach procedure chart are shown only when designated by the approving authority.

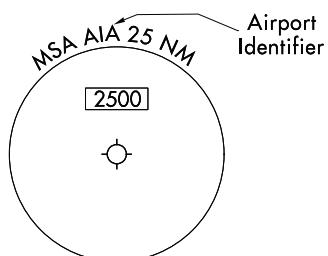
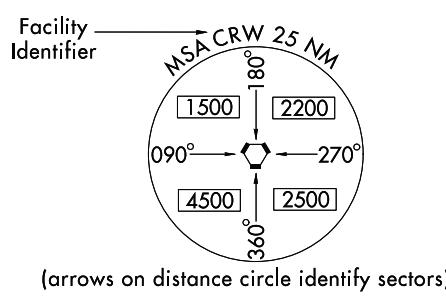
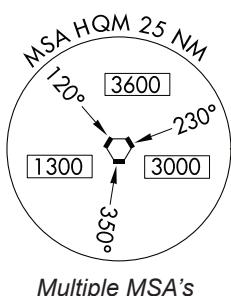
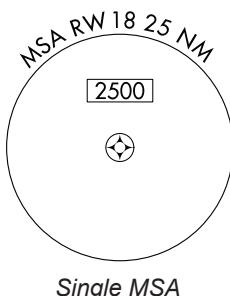
Air Defense Identification Zone (ADIZ)

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



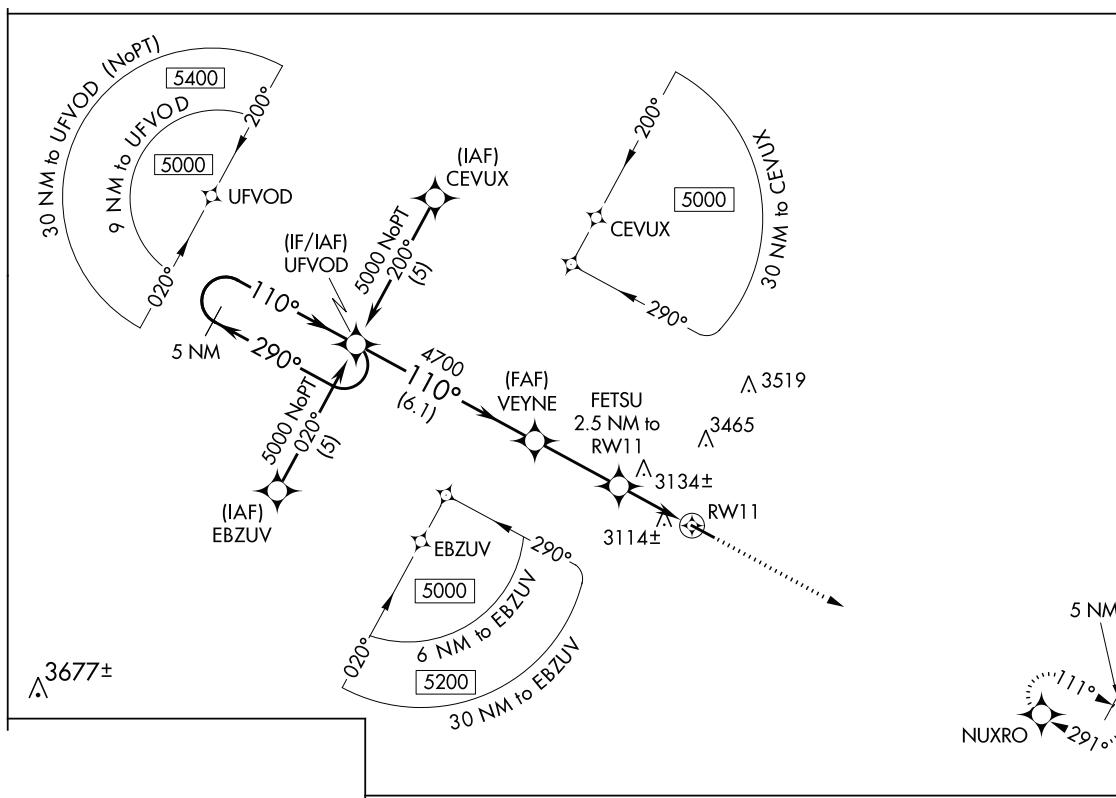
Minimum Safe Altitude (MSA)

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



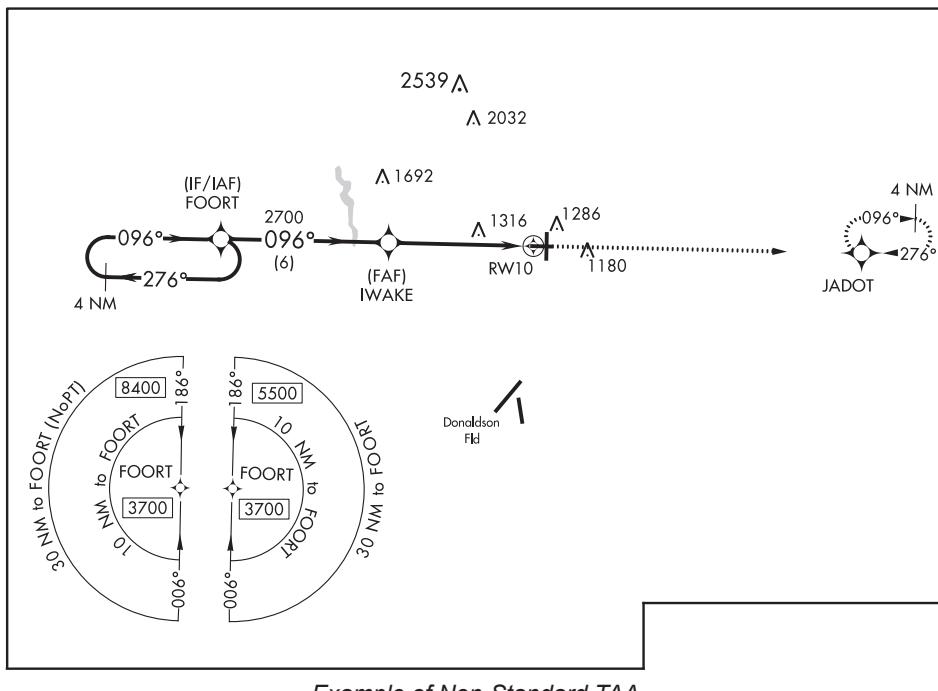
Terminal Arrival Areas (TAAs)

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



Example of Standard TAA

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



Example of Non-Standard TAA

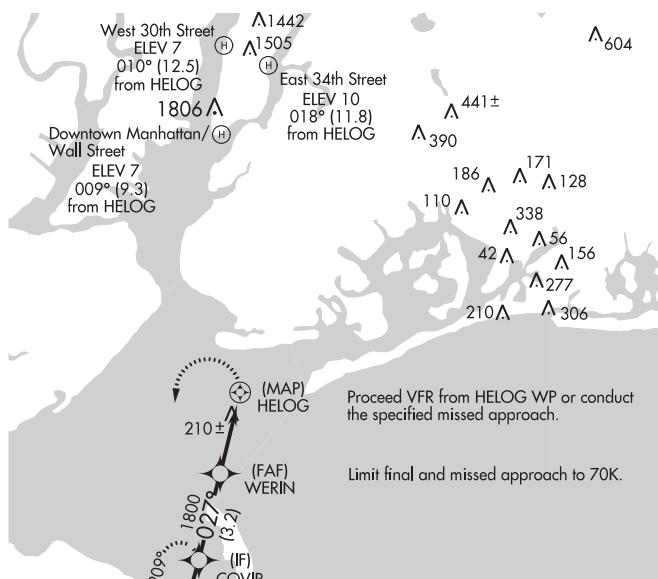
Helicopter (Copter) Procedures

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



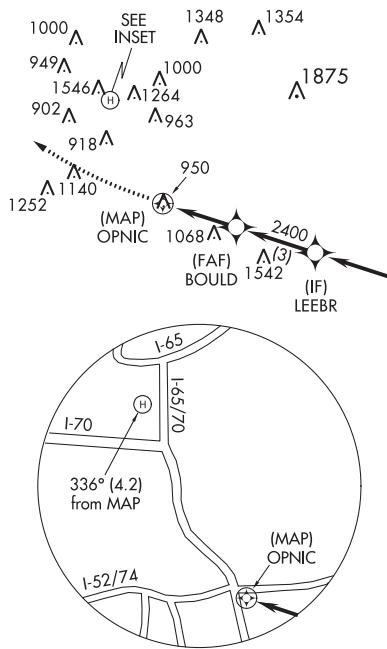
Visual Flight Segment

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



Example of Copter with VFR Segment (JFK)

When a visual flight path or VFR segment is required from the MAP to the heliport or alighting area, and as necessary for an explicit portrayal, an inset of the MAP area may be provided. This MAP area will depict significant landmark visual features. The procedure track, value and distance to the MAP and the visual segment and value to the landing point shall be shown within this inset. If it is a VFR segment, the reference bearing and distance text will be shown at the landing point.



Example of Copter with Inset

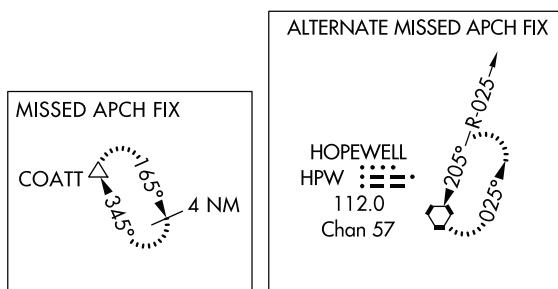
MISSED APPROACH INFORMATION

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

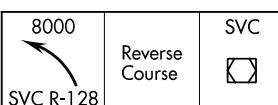
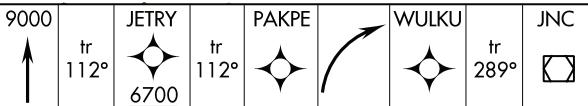
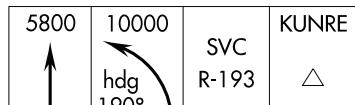
- The Middle Briefing Strip - The complete textual missed approach instructions are provided at the top of the approach chart in the middle pilot briefing strip.
- The Planview - The missed approach track is drawn using a thin, hash marked line with a directional arrow. If the missed approach fix is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

-----►
Missed Approach

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



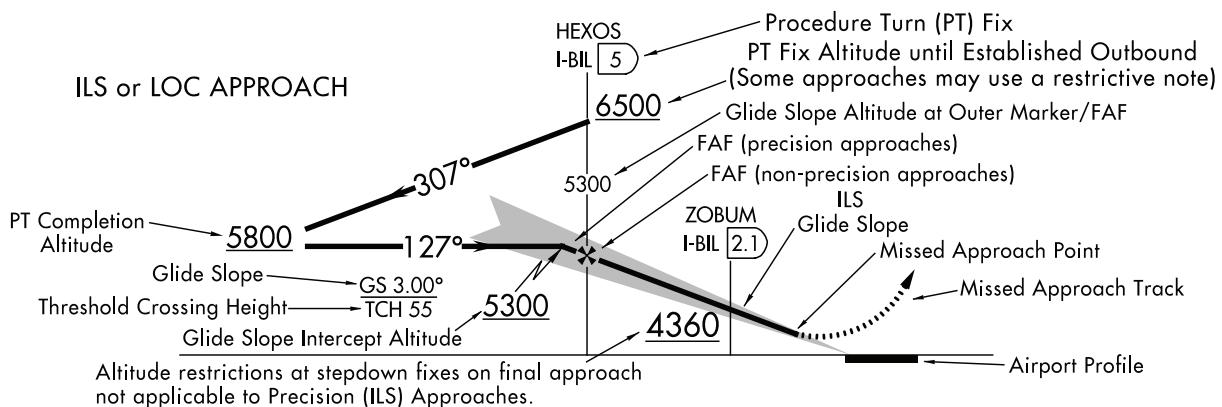
- The Profile Box - Missed Approach Icons will be depicted in the upper left or upper right of the profile box. The Missed Approach Icons are intended to provide quick, at a glance intuitive guidance to the pilot, to supplement the textual missed approach instructions in the briefing strip. Space permitting,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

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

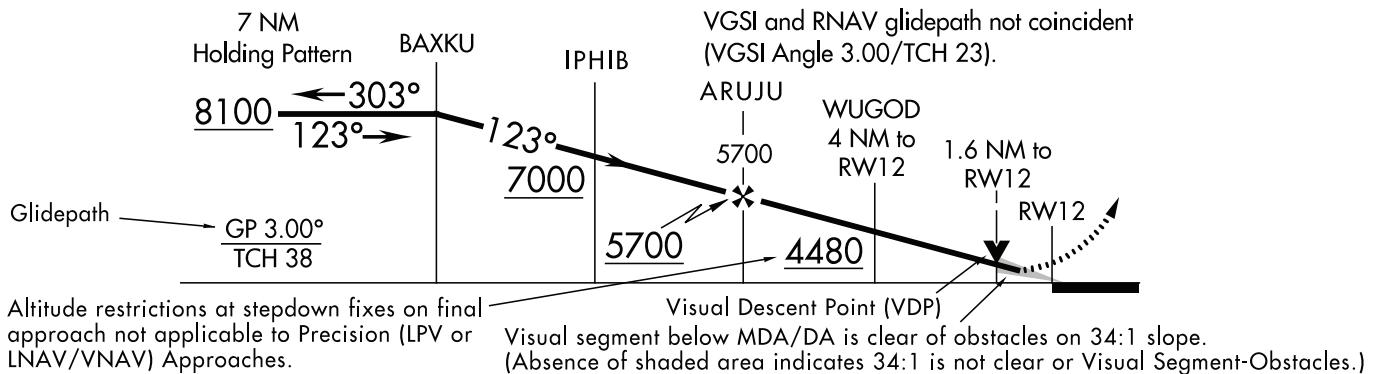
PROFILE VIEW

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

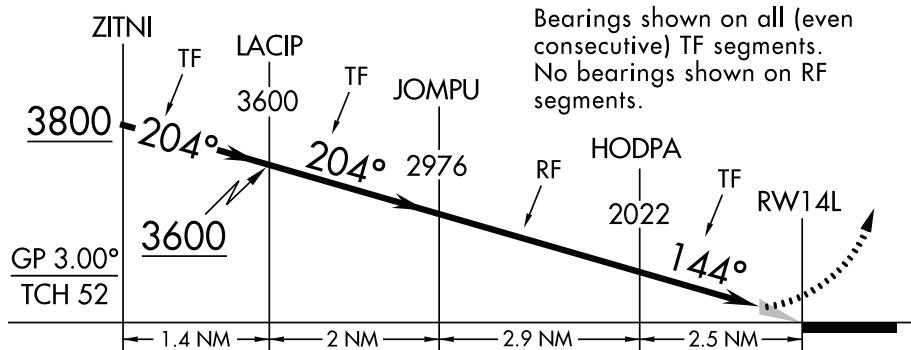
When a reference mark (*, **, #, etc.) is shown in the profile, the qualifying footnote is provided within the profile section.



RNAV and GLS PROCEDURES WITH VERTICAL GUIDANCE

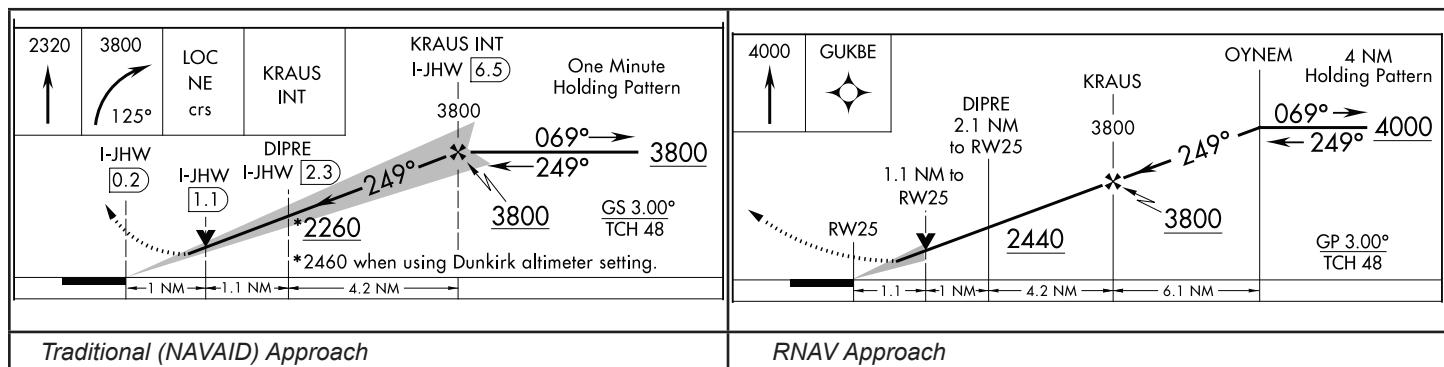


RNP APPROACH WITH TF AND RF SEGMENTS



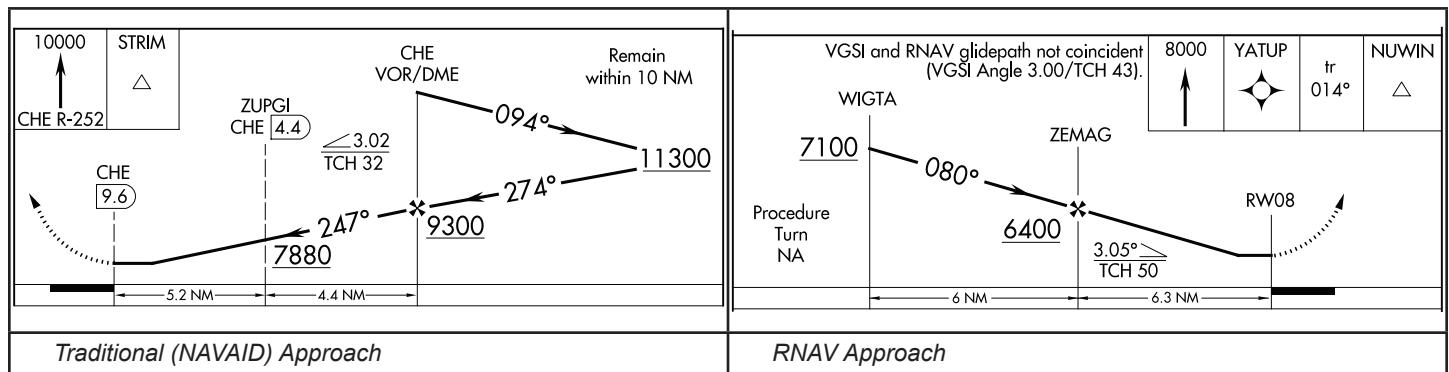
Precision Approaches

On precision approaches, the glideslope (GS) intercept altitude is illustrated by a zigzag line and an altitude. This is the minimum altitude for GS interception after completion of the procedure turn. Precision approach profiles also depict the GS angle of descent, threshold crossing height (TCH) and GS altitude at the outer marker (OM) or designated fix.



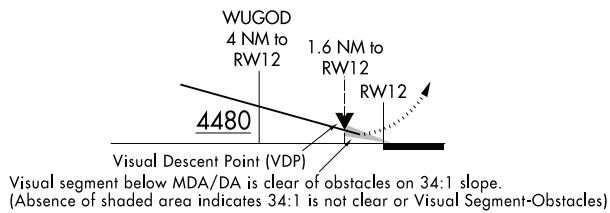
Non-Precision Approaches

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



Visual Descent Point (VDP)

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



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

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

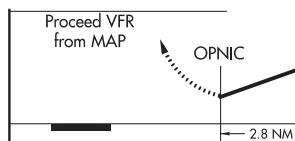


Visual Flight Path

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

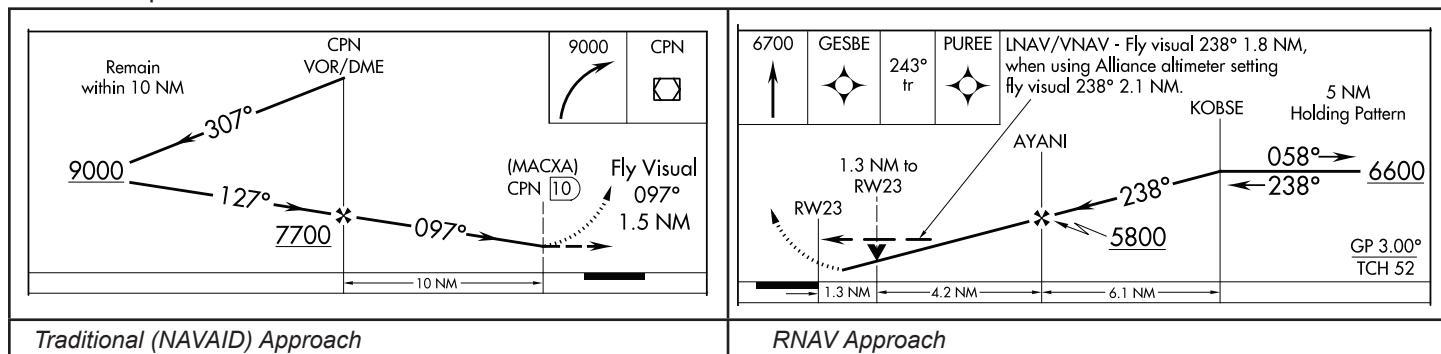
RNAV charts sometimes have visual flight for LNAV/VNAV minima that do not start at the missed approach point. An additional note indicating “LNAV/VNAV” will be placed above the note.

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



Copter VFR Segment

Chart Examples



ILS Glide Slope and RNAV Glidepath

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

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

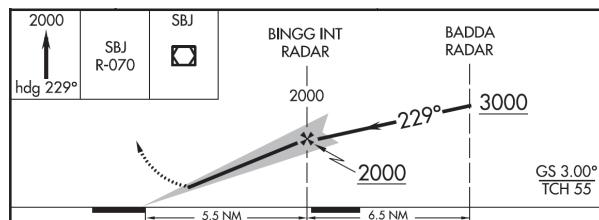
Threshold Crossing Height (TCH) has been traditionally used in "precision" approaches as the height of the glide slope above threshold. With publication of LNAV/VNAV minimums and RNAV descent angles, including graphically depicted descent profiles, TCH also applies to the height of the "descent angle,"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

34:1 Surface Clear Stipple Symbol

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

Secondary Airports

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



LANDING MINIMUMS

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

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

LANDING MINIMA FORMAT				
CATEGORY	Visibility (RVR 100's of feet)		Aircraft Approach Category	
	A	B	HAT	D
S-ILS 27	1352/24		200	(200-½)
S-LOC 27	1440/24	288	(300-½)	1440/50 288 (300-1)
CIRCLING	1540-1 361 (400-1)	1640-1 461 (500-1)	1640-1½ 461 (500-1½)	1740-2 561 (600-2)

MDA HAA Visibility in Statute Miles

COPTER MINIMA ONLY

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

Copter Approach Direction Height of MDA/DA Above Landing Area (HAL) No circling minimums are provided

Straight-in ILS to Runway 27

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

All weather minimums in parentheses not applicable to Civil Pilots.

Military Pilots refer to appropriate regulations.

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

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

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

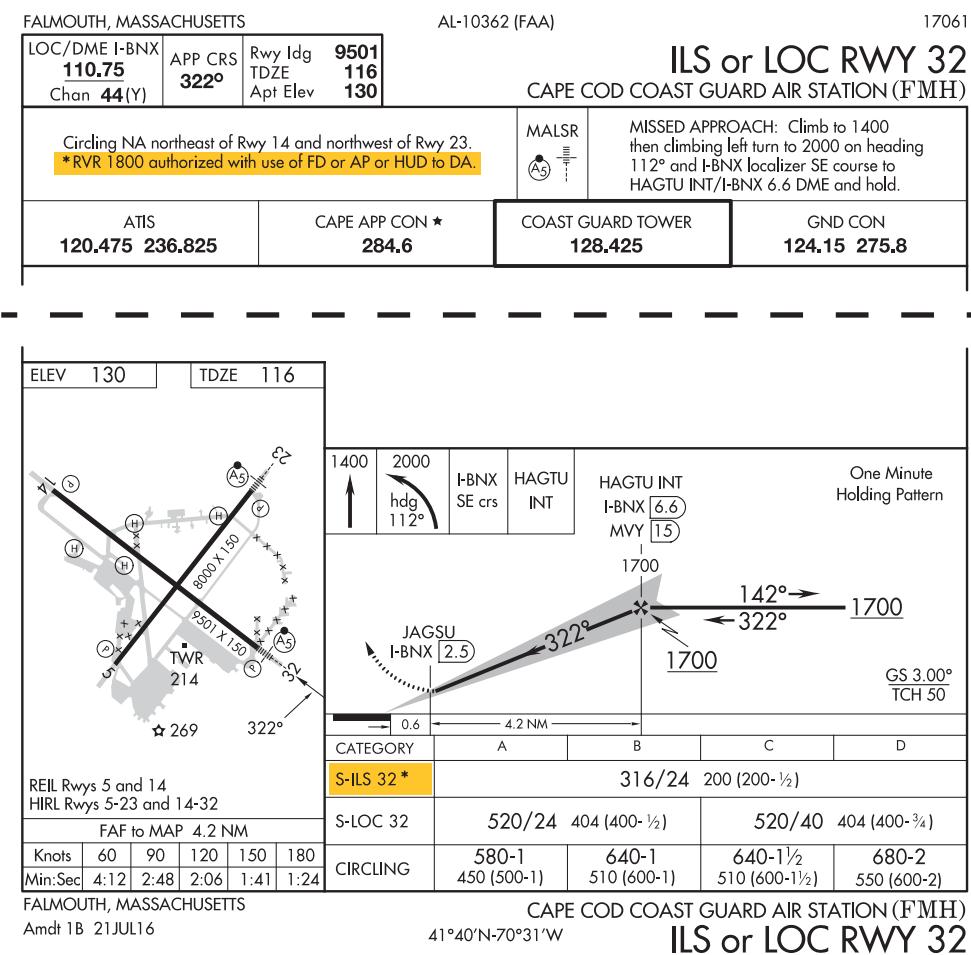
The visibility values are shown after the DA or MDA. They are provided in statute miles or runway visual range (RVR). RVR is reported in hundreds of feet. If the visibility is in statute miles, there is an altitude number, hyphen, whole or fractional number, e.g. 530-1. This indicates 530 feet MSL and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

Comparable Values of RVR and Visibility

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

RVR (feet)	Visibility (SM)						
1600	1/4	2400	1/2	3500	5/8	5500	1
1800	1/2	2600	1/2	4000	3/4	6000	1 1/4
2000	1/2	3000	5/8	4500	7/8		
2200	1/2	3200	5/8	5000	1		

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



Circling Minimums

There was a change to the TERPS criteria in 2012 that affects circling area dimension by expanding the areas to provide improved obstacle protection. To indicate that the new criteria had been applied to a given procedure, a **C** is placed on the circling line of minimums. The new circling tables and explanatory information is located in the Legend of the TPP.

The approaches using standard circling approach areas can be identified by the absence of the **C** on the circling line of minima.

CATEGORY	A	B	C	D
LPV DA	308/24	200 (200-½)		
LNAV/ VNAV DA	804-2	696 (700-2)		
LNAV MDA	800/24	692 (700-½)	800-1½	692 (700-1½)
CIRCLING	800-1	687 (700-1)	800-2	860-2½ 687 (700-2)
				747 (800-2½)

CATEGORY	A	B	C	D
C CIRCLING	9120-1¼ 1709 (1800-1¼)	9120-1½ 1709 (1800-1½)	9260-3 1849 (1900-3)	NA

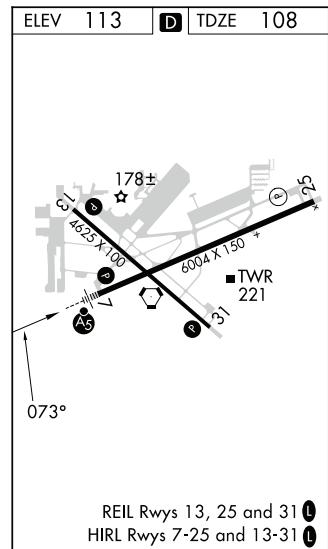
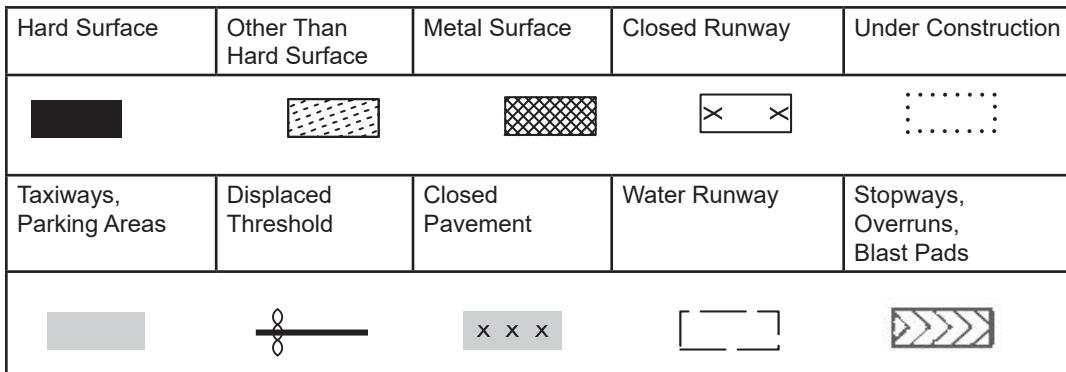
Apply Expanded Circling Approach Maneuvering Airspace Radius Table

Apply Standard Circling Approach Maneuvering Radius Table

AIRPORT SKETCH

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

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



Taxiways and aprons are shaded grey. Other runway features that may be shown are runway numbers, runway dimensions, runway slope, arresting gear, and displaced threshold.

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

Airport Elevation and Touchdown Zone Elevation

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

Runway Declared Distance Information

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

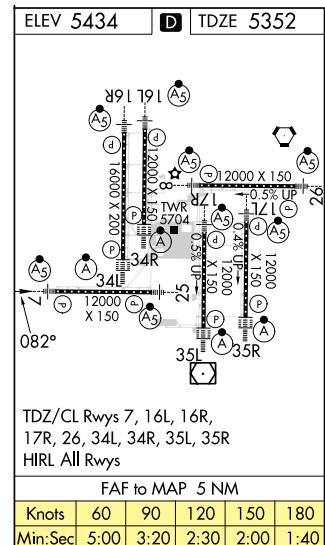
Runway Lights

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

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

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

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



Time/Distance Table

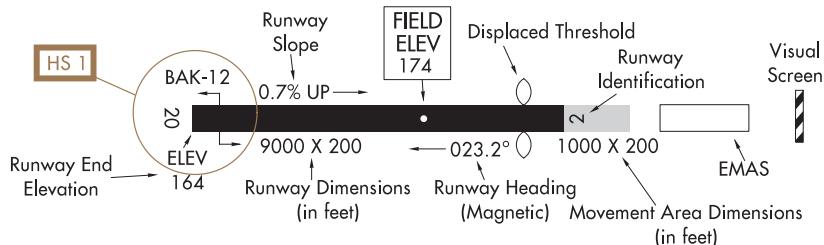
When applicable, a Time/Distance Table is provided below the airport sketch. The table provides the distance and time that is required from the final approach fix to the missed approach point for select groundspeeds.

Base Information (Copter Approaches Only)

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

AIRPORT DIAGRAMS

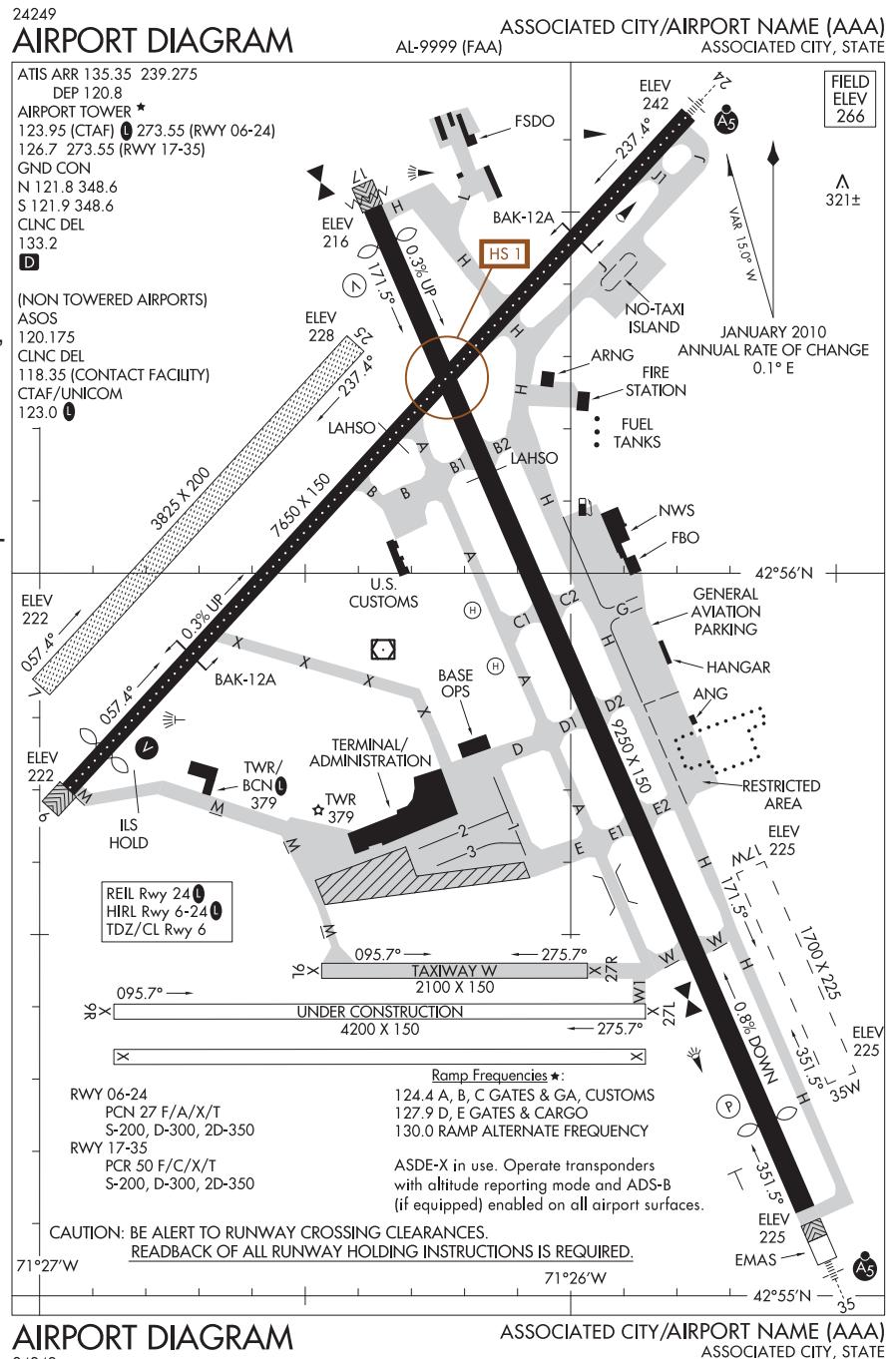
Airport Diagrams are specifically designed to assist in the movement of ground traffic at locations with complex runway/taxiway configurations. Airport Diagrams are not intended for use in approach and landing or departure operations. An airport diagram assists pilots in identifying their location on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



Airport Diagram Features:

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

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



Runway Construction

Runway construction is depicted as follows:

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

Hot Spots

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

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

DEPARTURE PROCEDURES (DPs)

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

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

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

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



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



(H)

Example of Copter with VFR Segment

STANDARD TERMINAL ARRIVAL (STARs) CHARTS

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

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

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

CHARTED VISUAL FLIGHT PROCEDURE (CVFP) CHARTS

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

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

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

U.S. TERMINAL PROCEDURES PUBLICATION SYMBOLS

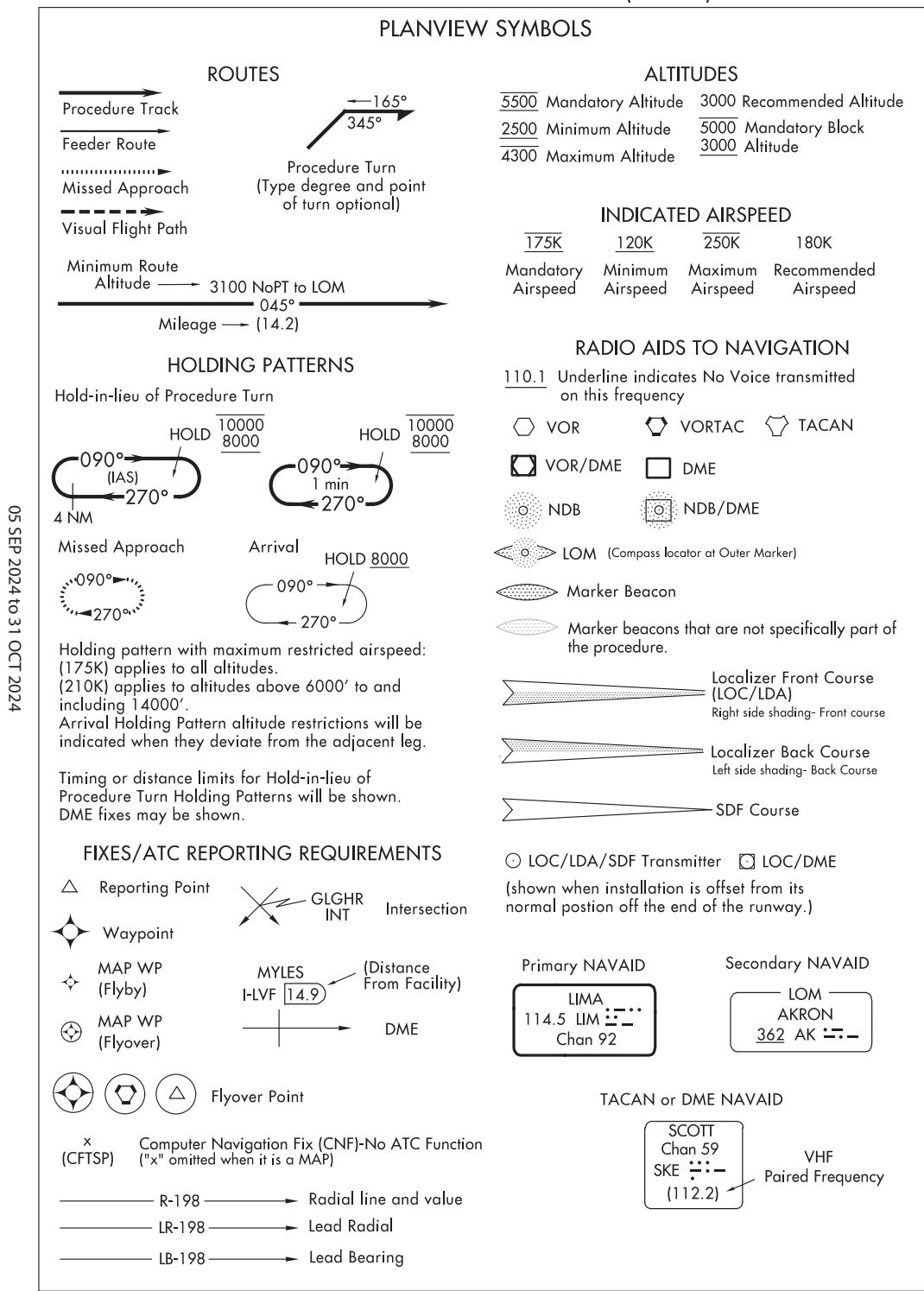
GENERAL INFORMATION

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

PLANVIEW SYMBOLS

LEGEND 23334

INSTRUMENT APPROACH PROCEDURES (CHARTS)

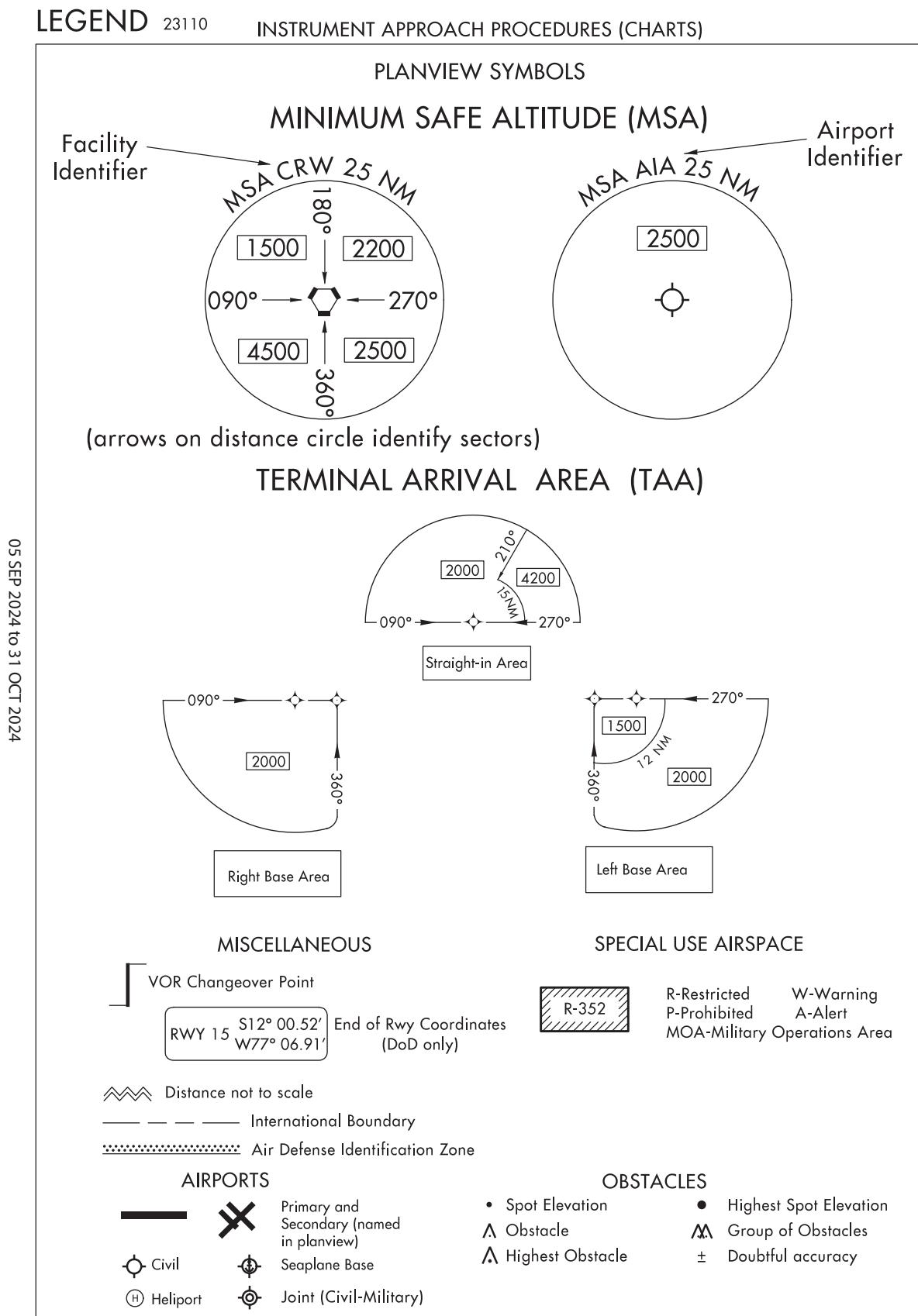


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LEGEND 23334

PLANVIEW SYMBOLS (Continued)



LEGEND 23110

PROFILE VIEW

LEGEND 22251

INSTRUMENT APPROACH PROCEDURES (CHARTS)

PROFILE VIEW

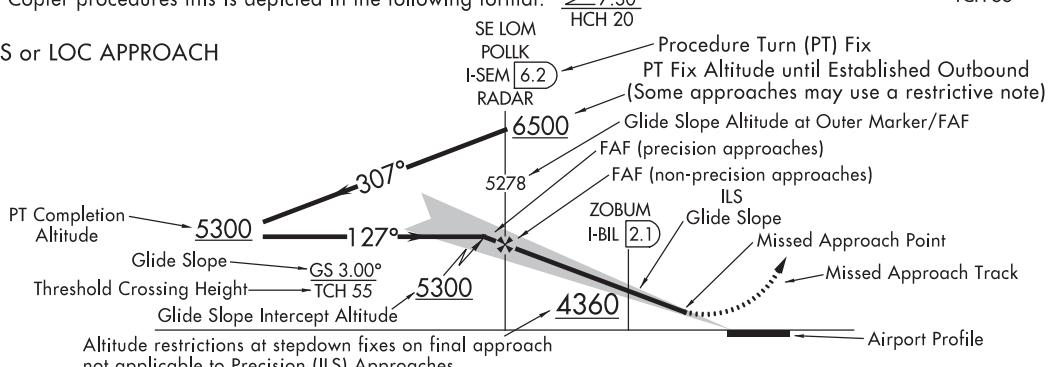
Three different methods are used to depict either electronic or vertical guidance: "GS", "GP", or "VDA".

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

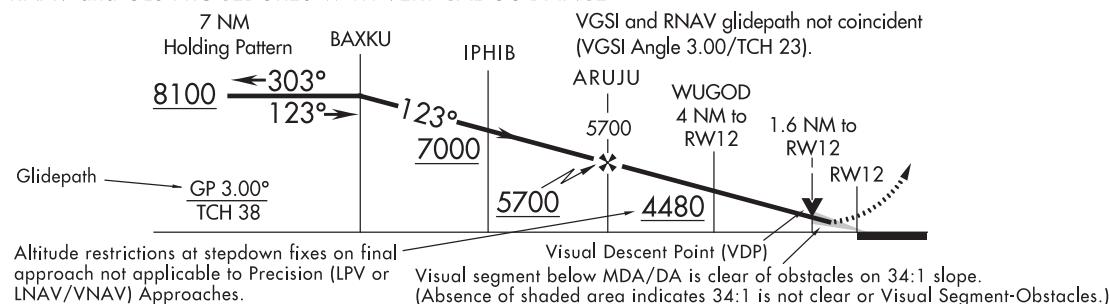
2. "GP" on GLS and RNAV procedures indicates that either electronic vertical guidance (via Wide Area Augmentation System - WAAS or Ground Based Augmentation System - GBAS) or barometric vertical guidance is provided. GLS and RNAV procedures with a published decision altitude (DA/H) depict a GP angle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

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

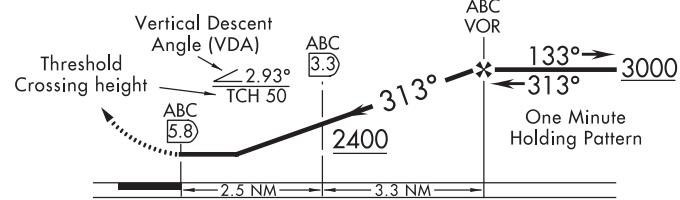
ILS or LOC APPROACH



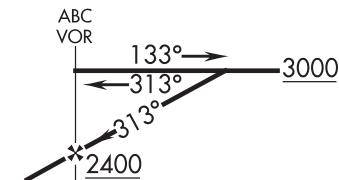
RNAV and GLS PROCEDURES WITH VERTICAL GUIDANCE



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



DESCENT FROM HOLDING PATTERN

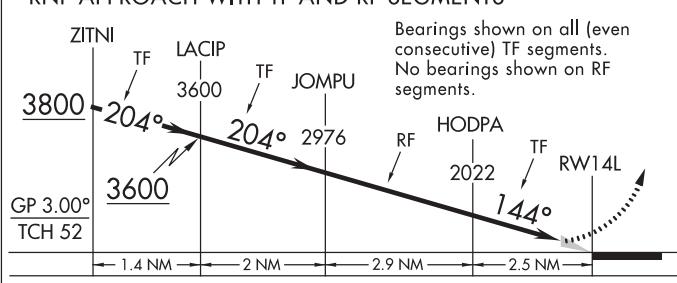


5500	Mandatory Altitude	3000	Recommended Altitude
2500	Minimum Altitude	5000	Mandatory Block Altitude
4300	Maximum Altitude	3000	Altitude

PROFILE SYMBOLS

	Note: Facilities and waypoints are depicted as a solid vertical line while fixes and intersections are depicted as a dashed vertical line.

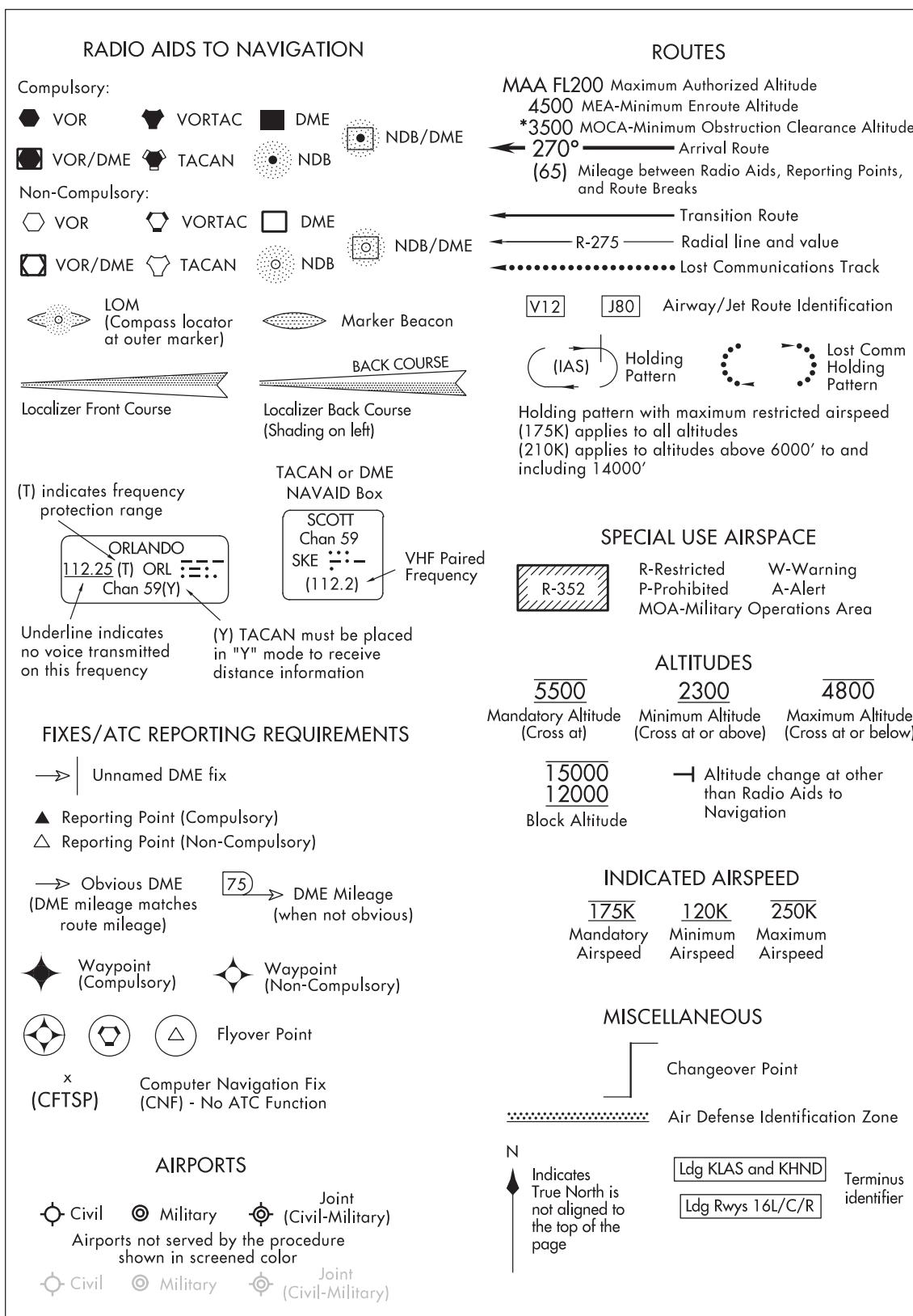
RNP APPROACH WITH TF AND RF SEGMENTS



LEGEND 22251

STANDARD TERMINAL ARRIVAL (STAR) CHARTS

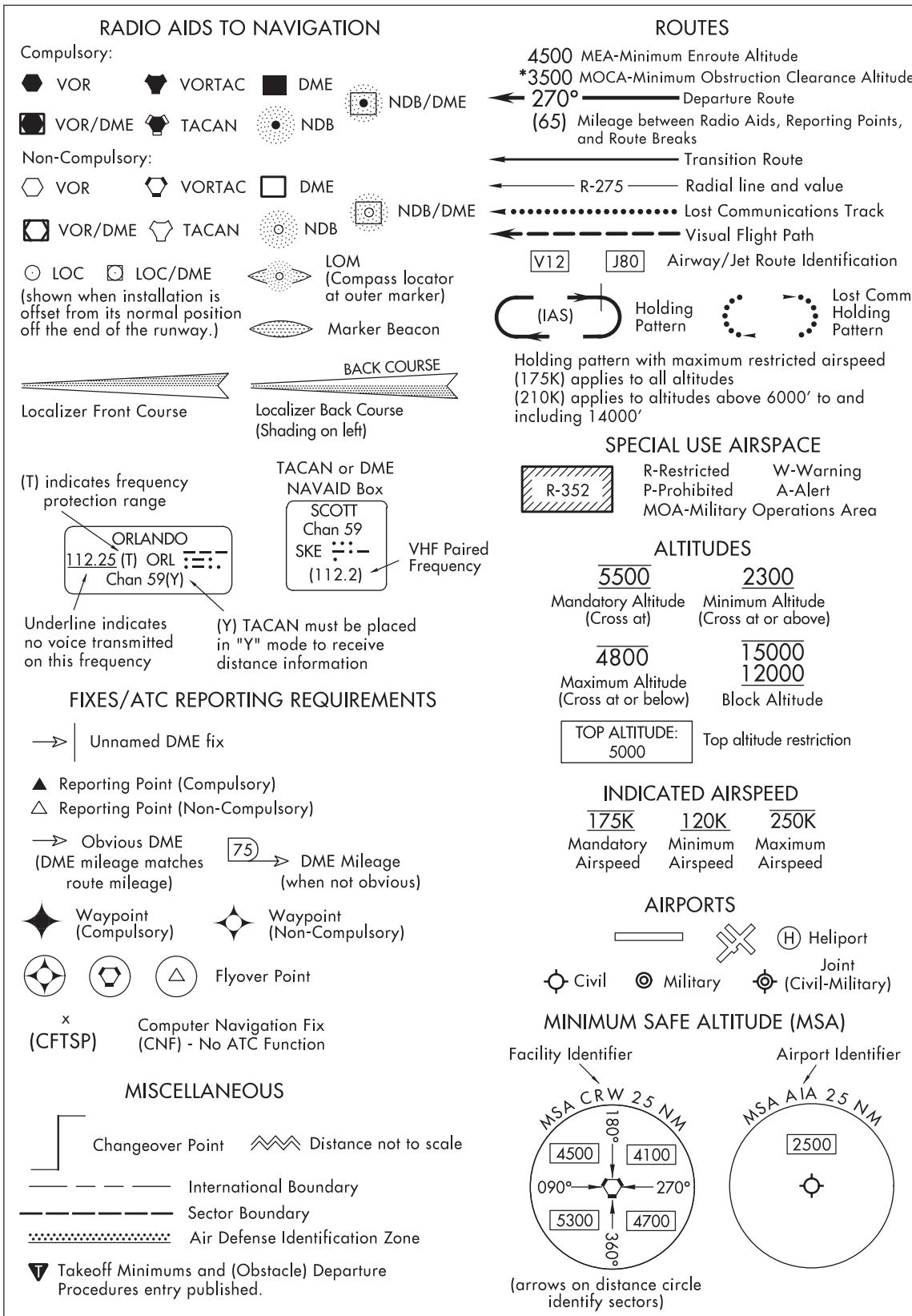
LEGEND 23334 STANDARD TERMINAL ARRIVAL (STAR) CHARTS



DEPARTURE PROCEDURE (DP) CHARTS

LEGEND 23334

DEPARTURE PROCEDURE (DP) CHARTS



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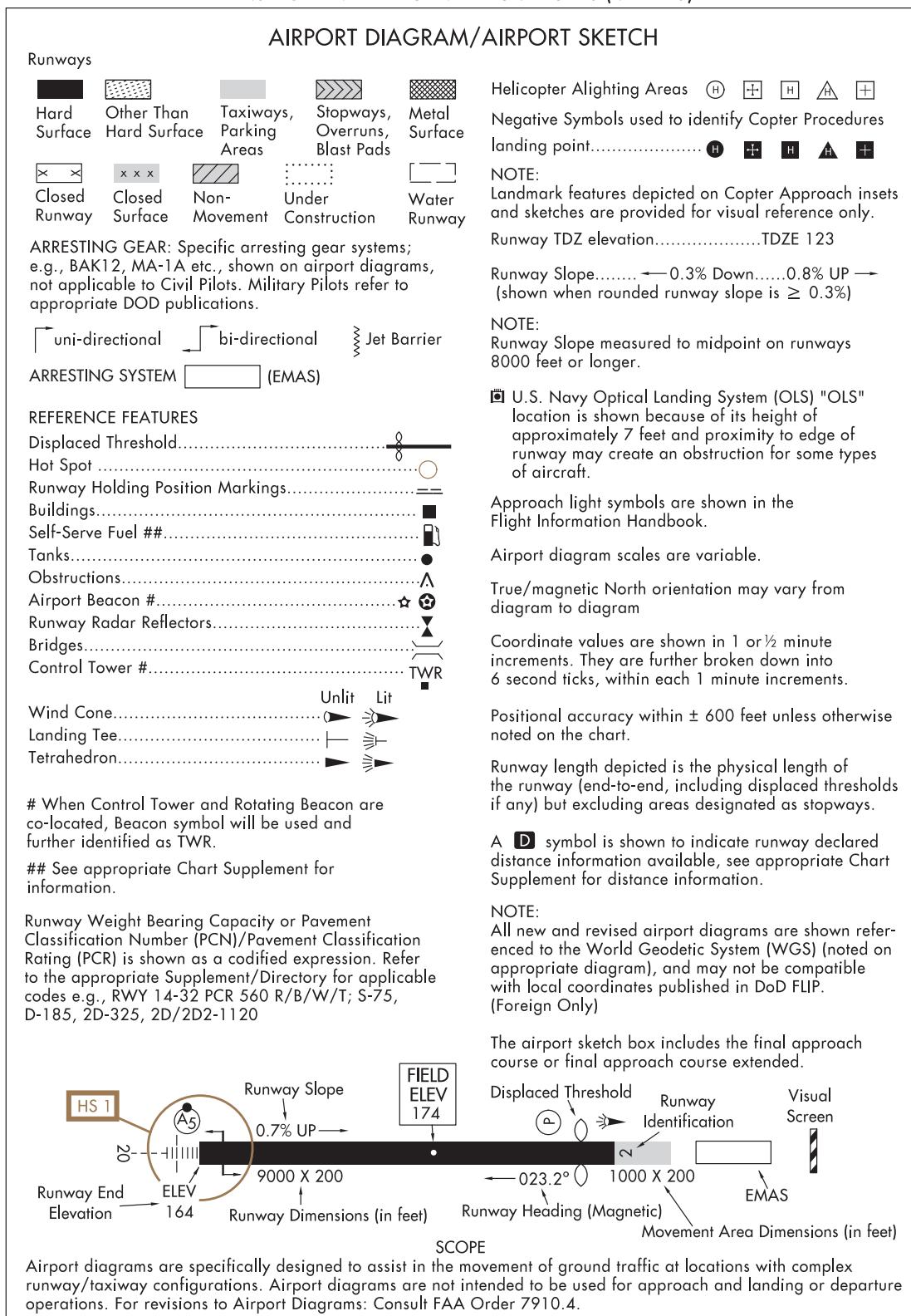
LEGEND 23334

AIRPORT DIAGRAM/AIRPORT SKETCH

24249

LEGEND

INSTRUMENT APPROACH PROCEDURES (CHARTS)



LEGEND

APPROACH LIGHTING SYSTEM

LEGEND 22195

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

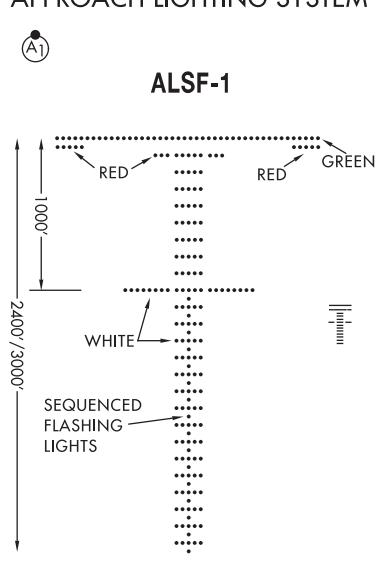
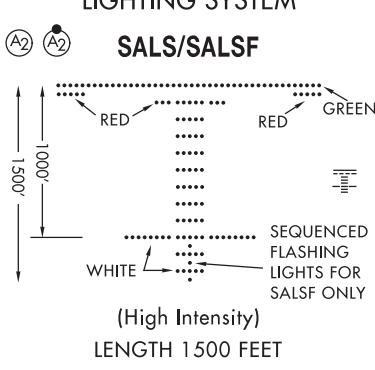
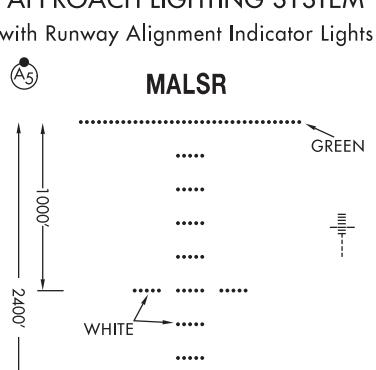
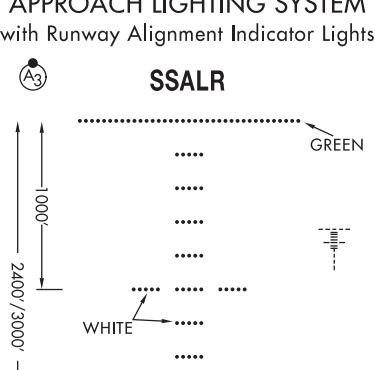
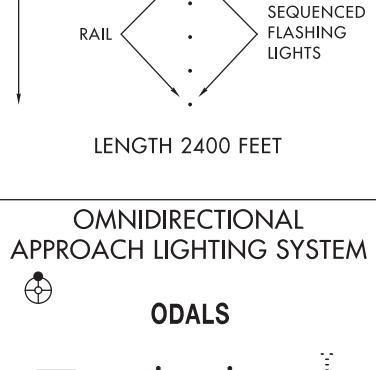
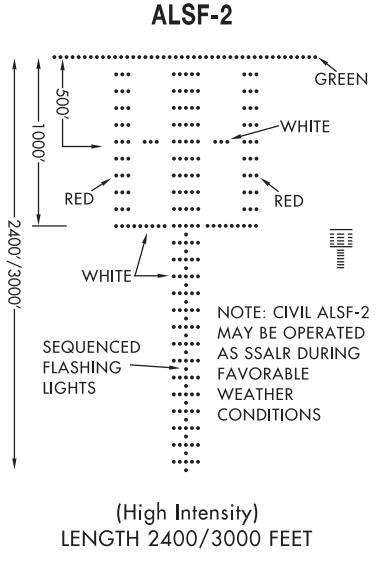
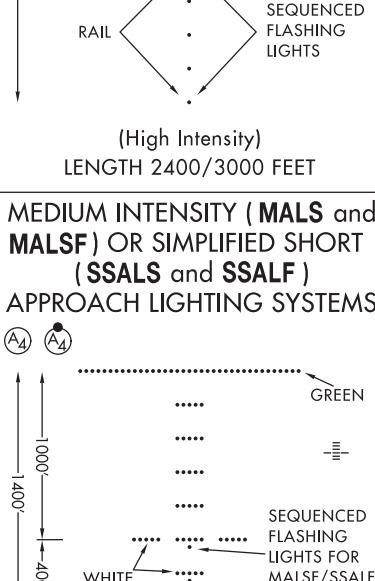
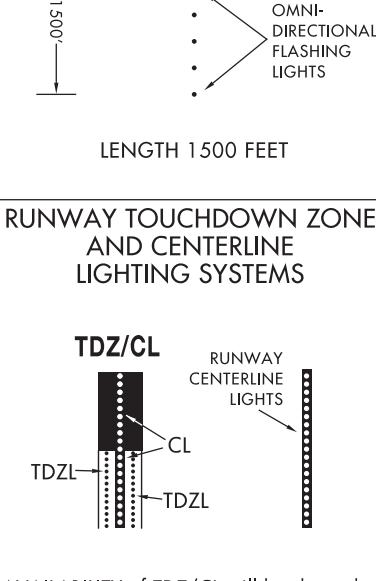
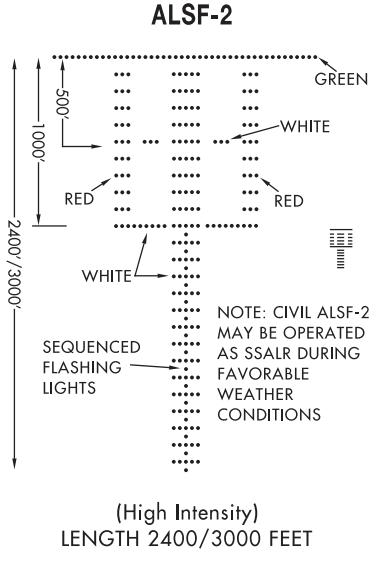
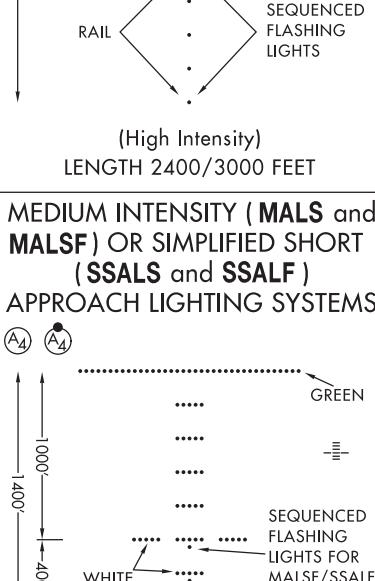
Approach lighting and visual glide slope systems are indicated on the airport sketch by an identifier, e.g., (A2), (V), etc.

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

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FAA Chart Users' Guide - Terminal Procedures Publication (TPP) - Symbols

 <p>ALSF-1</p> <p>(High Intensity) LENGTH 2400/3000 FEET</p>	SHORT APPROACH LIGHTING SYSTEM SALS/SALSF  <p>SEQUENCED FLASHING LIGHTS FOR SALSF ONLY (High Intensity) LENGTH 1500 FEET</p>	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM with Runway Alignment Indicator Lights MALSR  <p>SEQUENCED FLASHING LIGHTS LENGTH 2400 FEET</p>
	SIMPLIFIED SHORT APPROACH LIGHTING SYSTEM with Runway Alignment Indicator Lights SSALR  <p>SEQUENCED FLASHING LIGHTS (High Intensity) LENGTH 2400/3000 FEET</p>	OMNIDIRECTIONAL APPROACH LIGHTING SYSTEM ODALS  <p>SEQUENCED FLASHING LIGHTS LENGTH 1500 FEET</p>
 <p>ALSF-2</p> <p>(High Intensity) LENGTH 2400/3000 FEET</p> <p>NOTE: CIVIL ALSF-2 MAY BE OPERATED AS SSALR DURING FAVORABLE WEATHER CONDITIONS</p>	MEDIUM INTENSITY (MALS and MALSF) OR SIMPLIFIED SHORT (SSALS and SSALF) APPROACH LIGHTING SYSTEMS  <p>SEQUENCED FLASHING LIGHTS FOR MALSF/SSALF ONLY LENGTH 1400 FEET</p>	RUNWAY TOUCHDOWN ZONE AND CENTERLINE LIGHTING SYSTEMS TDZ/CL  <p>RUNWAY CENTERLINE LIGHTS CL TDZL TDZL</p> <p>AVAILABILITY of TDZ/CL will be shown by NOTE in SKETCH e.g. "TDZ/CL Rwy 15"</p>
	 <p>ALSF-2</p> <p>(High Intensity) LENGTH 2400/3000 FEET</p> <p>NOTE: CIVIL ALSF-2 MAY BE OPERATED AS SSALR DURING FAVORABLE WEATHER CONDITIONS</p>	 <p>SEQUENCED FLASHING LIGHTS FOR MALSF/SSALF ONLY LENGTH 1400 FEET</p>

LEGEND 22195

APPROACH LIGHTING SYSTEM (Continued)

LEGEND 22195

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

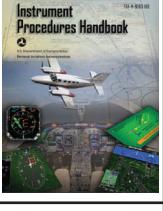
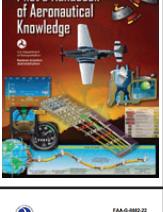
Approach lighting and visual glide slope systems are indicated on the airport sketch by an identifier, **(A2)**, **(V)** etc.

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

<p>(P) PRECISION APPROACH PATH INDICATOR PAPI</p> <p>Legend: □ White ■ Red</p>	<p>(V2) PULSATING VISUAL APPROACH SLOPE INDICATOR PVASI</p>
<p>(V) VISUAL APPROACH SLOPE INDICATOR VASI</p> <p>VISUAL APPROACH SLOPE INDICATOR WITH STANDARD THRESHOLD CLEARANCE PROVIDED.</p> <p>ALL LIGHTS WHITE — TOO HIGH FAR LIGHTS RED — ON GLIDE SLOPE NEAR LIGHTS WHITE — TOO LOW</p> <p>ALL LIGHTS RED — TOO LOW</p> <p>VASI 2 VASI 4</p> <p>VASI 12</p>	<p>CAUTION: When viewing the pulsating visual approach slope indicators in the pulsating white or pulsating red sectors, it is possible to mistake this lighting aid for another aircraft or a ground vehicle. Pilots should exercise caution when using this type of system.</p> <p>(V4) TRI-COLOR VISUAL APPROACH SLOPE INDICATOR TRCV</p> <p>CAUTION: When the aircraft descends from green to red, the pilot may see a dark amber color during the transition from green to red.</p>
<p>(V3) VISUAL APPROACH SLOPE INDICATOR VASI</p> <p>3-BAR, 6 OR 16 BOX, VISUAL APPROACH SLOPE INDICATOR THAT PROVIDES 2 GLIDE ANGLES AND 2 THRESHOLD CROSSING HEIGHTS.</p> <p>VASI 6 VASI 16</p>	<p>(V5) ALIGNMENT OF ELEMENTS SYSTEMS APAP</p> <p>Painted panels which may be lighted at night. To use the system the pilot positions the aircraft so the elements are in alignment.</p>

REFERENCES

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

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

ABBREVIATIONS

A

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

B

Baro-VNAV - Barometric Vertical Navigation
 BS - Broadcast Station

C

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

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

D

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

E

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

F

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

G

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

H

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

I

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

J

JO - Joint Order

K

KIAS - Knots

L

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

M

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

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

N

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

O

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

P

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

R

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

S

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

T

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

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

U

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

V

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

W

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