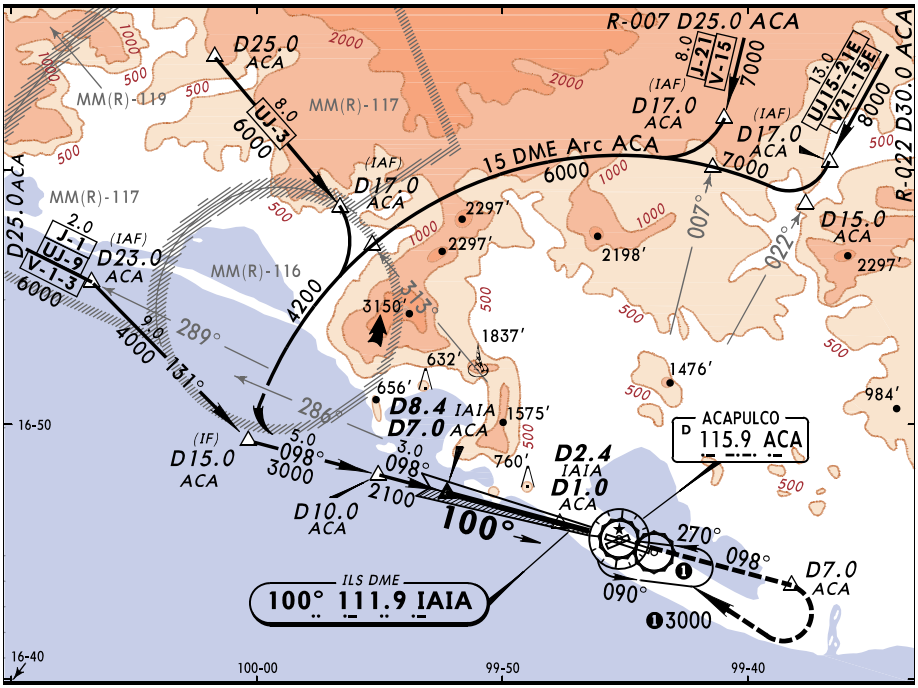
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INTRODUCTION TO JEPPESEN NAVIGATION CHARTS

These charts are for training purposes only and are not to be used for flight.

The chart training guide is published as a service for pilots training with Jeppesen charts. It is intended for reference only and includes some of the most commonly used symbology. Not all symbology is included with this guide. This guide is revised regularly; however, some variance may exist between this guide and current chart services. These may be the result of one or more of the following: chart issuance dates, timely application of changes received from governing agencies and / or the method of representing such information. Some of the charts used in this guide are based on a fictitious location. The chart training guide has been designed as supplementary training material and is not intended for navigation.

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CHART GLOSSARY

This glossary provides definitions that are unique and abbreviations commonly used in Jeppesen publications. No attempt has been made to list all the terms of basic aeronautical nomenclature.

Because of the international nature of flying, terms used by the FAA (USA) are included when they differ from International Civil Aviation Organization (ICAO) definitions. An arrow or vertical bar, that is omitted on all new pages, tables of contents, tabular listings and graphics, indicates changes.

DEFINITIONS

ACCELERATE STOP DISTANCE AVAILABLE (ASDA) — The length of the takeoff run available plus the length of the stopway, if provided.

ADEQUATE VIS REF (Adequate Visual Reference) — Runway markings or runway lighting that provides the pilot with adequate visual reference to continuously identify the takeoff surface and maintain directional control throughout the takeoff run.

ADVISORY ROUTE (ADR) — A designated route along which air traffic advisory service is available.

NOTE: Air traffic control service provides a much more complete service than air traffic advisory service; advisory areas and routes are therefore not established within controlled airspace, but air traffic advisory service may be provided below and above control areas.

ADVISORY SERVICE — Advice and information provided by a facility to assist pilots in the safe conduct of flight and aircraft movement.

AERODROME FLIGHT INFORMATION SERVICE (AFIS) — A directed traffic information and operational information service provided within an aerodrome flight information zone, to all radio equipped aircraft, to assist in the safe and efficient conduct of flight.

AERODROME REFERENCE CODE — A simple method for interrelating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodromes facilities that are suitable for the aeroplanes that are intended to operate at the aerodrome. The aerodrome reference code — code number and letter, which are selected for aerodrome planning purposes, have the meanings assigned to them as indicated in the table below:

Code Element 1			Code Element 2	
Code Number	Aeroplane Reference Field Length	Code Letter	Wing Span	Outer Main Gear Wheel Span [a]
(1)	(2)	(3)	(4)	(5)
1	Less than **800m**	A	Up to but not including **15m**	Up to but not including **4.5m**
2	**800m** up to but not including **1200m**	B	**15m** up to but not including **24m**	**4.5m** up to but not including **6m**
3	**1200m** up to but not including **1800m**	C	**24m** up to but not including **36m**	**6m** up to but not including **9m**
4	**1800m** and over	D	**36m** up to but not including **52m**	**9m** up to but not including **14m**
		E	**52m** up to but not including **65m**	**9m** up to but not including **14m**
		F	**65m** up to but not including **80m**	**14m** up to but not including **16m**

[a] Distance between the outside edges of the main gear wheels.

NOTE: Guidance on planning for aeroplanes with wing spans greater than 80m is given in the ICAO Doc. 9157 "Aerodrome Design Manual," Parts 1 and 2.

AERODROME TRAFFIC FREQUENCY (ATF) — A frequency designated at an uncontrolled airport. An ATF is used to ensure all radio equipped aircraft operating within the area, normally within a 5 NM radius of the airport, are listening on a common frequency. The ATF is normally the ground station frequency. Where a ground station does not exist, a common frequency is designated. Radio call sign is that of the ground station, or where no ground station exists, a broadcast is made with the call sign "Traffic Advisory." Jeppesen charts list the frequency and the area of use when other than the standard 5 NM.

AERODROME TRAFFIC ZONE (ATZ) — An airspace of detailed dimensions established around an aerodrome for the protection of aerodrome traffic.

AERONAUTICAL RADIO, INCORPORATED (ARINC) — An international radio network providing air-to-ground communications available on a subscription (fee) basis.

AIRCRAFT APPROACH CATEGORY (USA TERPS) — A grouping of aircraft based on a speed of Vref, if specified, or if V_{ref} is not specified, 1.3 V_{S0} at the maximum certificated landing weight. V_{ref} , V_{S0} , and the maximum certificated landing weight are those values as established for the aircraft by the certification authority of the country of registry. An aircraft shall fit in only one category. If it is necessary to maneuver at speeds in excess of the upper limit of a speed range for a category, the minimums for the next higher category should be used. For example, an aircraft which falls in Category A, but is circling to land at a speed in excess of 91 knots, should use the approach Category B minimums when circling to land. The categories are as follows:

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Category A	Speed less than 91 knots.
Category B	Speed 91 knots or more but less than 121 knots.
Category C	Speed 121 knots or more but less than 141 knots.
Category D	Speed 141 knots or more but less than 166 knots.
Category E	Speed 166 knots or more.

NOTE: Category E includes only certain Military Aircraft and is not included on Jeppesen Approach Charts.

AIRCRAFT APPROACH CATEGORY (ICAO) — The following ICAO table indicates the specified range of handling speeds (IAS in Knots) for each category of aircraft to perform the maneuvers specified. These speed ranges have been assumed for use in calculating airspace and obstacle clearance for each procedure.

Aircraft Category	V_{at}	Range of Speeds for Initial Approach	Range of Final Approach Speeds	Max speeds for Visual Maneuvering (Circling)	Max speeds for Missed Approach	
					Intermediate	Final
A	<91	90/150(110*)	70/100	100	100	110
B	91/120	120/180(140*)	85/130	135	130	150
C	121/140	160/240	115/160	180	160	240
D	141/165	185/250	130/185	205	185	265
E	166/210	185/250	155/230	240	230	275

V_{at} —Speed at threshold based on 1.3 times stall speed in the landing configuration at maximum certificated landing mass.

*Maximum speed for reversal and racetrack procedures.

Category E contains only certain Military Aircraft and is not included on Jeppesen Approach Charts.

NOTE: The speed table applies to the new ICAO approach procedures which are identifiable by the OCA(H) figures and the PANS-OPS notation on the lower left corner of the approach chart. Old ICAO approach procedures show an OCL instead of OCA(H). Deviations are listed in the Air Traffic Control section.

AIR DEFENSE IDENTIFICATION ZONE — The area of airspace over land or water, extending upward from the surface, within which the ready identification, the location, and the control of aircraft are required in the interest of national security.

AIRPORT ELEVATION/FIELD ELEVATION — The highest point of an airports usable runways measured in feet from mean sea level. In a few countries, the airport elevation is determined at the airport reference point.

AIRPORT REFERENCE POINT (ARP) — A point on the airport designated as the official airport location.

AIRPORT SURVEILLANCE RADAR (ASR) — Approach control radar used to detect and display an aircraft's position in the terminal area. ASR provides range and azimuth information but does not provide elevation data. Coverage of the ASR can extend up to 60 miles.

AIR TRAFFIC CONTROL CLEARANCE — An authorization by air traffic control, for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified traffic conditions within controlled airspace.

AIR TRAFFIC CONTROL ASSIGNED AIRSPACE (ATCAA) — Airspace of defined vertical/lateral limits, assigned by ATC, for the purpose of providing air traffic segregation between the specified activities being conducted within the assigned airspace and other IFR air traffic.

AIR TRAFFIC SERVICES (ATS) ROUTE — A specified route designated for channeling the flow of traffic as necessary for provision of air traffic services.

NOTE: The term "ATS Route" is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.

AIR TRAFFIC SERVICES (ATS) ROUTE (USA) — A generic term that includes 'VOR Federal airways', 'colored Federal airways', 'jet routes', 'Military Training Routes', 'named routes', and 'RNAV routes.'

AIRWAY (ICAO) — A control area or portion thereof established in the form of a corridor equipped with radio navigation aids.

AIRWAY (USA) — A Class "E" airspace area established in the form of a corridor, the centerline of which is defined by radio navigational aids.

ALONG TRACK DISTANCE — The distance measured from a point-in-space by systems using area navigation reference capabilities that are not subject to slant range errors.

ALTERNATE AERODROME (ICAO) — An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing.

NOTE: The aerodrome from which a flight departs may also be an enroute or a destination alternate aerodrome for that flight.

ALTERNATE AIRPORT (USA) — An airport at which an aircraft may land if a landing at the intended airport becomes inadvisable.

ALTIMETER SETTING — The barometric pressure reading used to adjust a pressure altimeter for variations in existing atmospheric pressure or to the standard altimeter setting (29.92 inches of mercury, 1013.2 hectopascals or 1013.2 millibars).

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CHART GLOSSARY

ALTITUDE (ICAO) — The vertical distance of a level, a point, or an object considered as a point, measured from Mean Sea Level (MSL).

ALTITUDE (USA) — The height of a level, point or object measured in feet Above Ground Level (AGL) or from Mean Sea Level (MSL).

a. AGL Altitude — Altitude expressed in feet measured above ground level (QFE).

b. MSL Altitude — Altitude expressed in feet measured from mean sea level (QNH).

c. Indicated Altitude — The Altitude as shown by an altimeter. On a pressure barometric altimeter it is altitude as shown uncorrected for instrument error and uncompensated for variation from standard atmospheric conditions.

APPROACH PROCEDURE WITH VERTICAL GUIDANCE (APV) — An instrument approach based on a navigation system that is not required to meet the precision approach standards of ICAO Annex 10 but provides course and glide path deviation information (sometimes referred to as "semi-precision"). Baro-VNAV, LDA with glide path, LNAV/VNAV and LPV are examples of APV approaches.

AREA NAVIGATION/RNAV — A method of navigation that permits aircraft operations on any desired course within the coverage of station referenced navigation signals or within the limits of self contained system capability.

ARRIVAL ROUTES (ICAO) — Routes on an instrument approach procedure by which aircraft may proceed from the enroute phase of flight to the initial approach fix.

ATIS — ASOS INTERFACE — A switch that allows ASOS weather observations to be appended to the ATIS broadcast, making weather information available on the same (ATIS) frequency H24. When the tower is open, ATIS information and the hourly weather will be broadcast. When the tower is closed, one-minute weather information updates are broadcast, and the controller can add overnight ATIS information to the ASOS automated voice weather message.

ATS ROUTE — See "AIR TRAFFIC SERVICES (ATS) ROUTE"

AUTOMATIC DEPENDENT SURVEILLANCE (ADS) — A surveillance technique, in which aircraft automatically provide, via a data link, data derived from on-board navigation and position fixing systems, including aircraft identification, four-dimensional position and additional data as appropriate.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS) — The Automated Surface Observation System, in the United States, is a surface weather observing system implemented by the National Weather Service, the Federal Aviation Administration and the Department of Defense. It is designed to support aviation operations and weather forecast activities. The ASOS provides continuous minute-by-minute observations and performs the basic observing functions necessary to generate an aviation routine weather report (METAR) and other aviation weather information. ASOS information may be transmitted over a discrete VHF radio frequency or the voice portion of a local navaid.

AUTOMATED WEATHER OBSERVING SYSTEM (AWOS) — An automated weather reporting system which transmits local real-time weather data directly to the pilot.

AWOS-A Only reports altimeter setting.

AWOS-1 Usually reports altimeter setting, wind data, temperature, dewpoint and density altitude.

AWOS-2 Reports same as AWOS-1 plus visibility.

AWOS-3 Reports the same as AWOS-2 plus cloud/ceiling data.

AUTOMATED WEATHER SENSOR SYSTEM (AWSS) — A surface weather observing system similar to AWOS and ASOS, providing all the weather information furnished by ASOS systems. The AWSS sensor suite automatically collects, measures, processes, and broadcasts surface weather data including altimeter setting, temperature and dew point, cloud height and coverage, visibility, present weather (rain, drizzle, snow), rain accumulation, freezing rain, thunderstorms, fog, mist, haze, freezing fog, as well as wind speed, direction, and gusts.

BRAKING ACTION (GOOD, FAIR, POOR, NIL) — A report of conditions on the airport movement area providing a pilot with a degree/quality of braking that might be expected. Braking action is reported in terms of good, fair, poor, or nil.

CARDINAL ALTITUDES OR FLIGHT LEVELS — "Odd" or "Even" thousand-foot altitudes or flight levels; e.g., 5000, 6000, 7000, FL60, FL250, FL260, FL270.

CATCH POINT — A fix/waypoint that serves as a transition point from the high altitude waypoint navigation structure to the low altitude structure or an arrival procedure (STAR).

CEILING (ICAO) — The height above the ground or water of the base of the lowest layer of cloud below 6000 meters (20,000 feet) covering more than half the sky.

CEILING (USA) — The height above the earth's surface of the lowest layer of clouds or obscuring phenomena that is reported as "broken", "overcast", or "obscuration", and not classified as "thin", or "partial".

CHART CHANGE NOTICES — Jeppesen Chart Change Notices include significant information changes affecting Enroute, Area, and Terminal charts. Entries are published until the temporary condition no longer exists, or until the permanent change appears on revised charts. Enroute chart numbers / panel numbers / letters and area chart identifiers are included for each entry in the enroute portion of the Chart Change Notices. To avoid duplication of information in combined Enroute and Terminal Chart Change Notices , navaid conditions, except for ILS components, are listed only in the Enroute portion of the Chart Change Notices . All times are local unless otherwise indicated. Arrows

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indicate new or revised information. Chart Change Notices are only an *abbreviated* service. Always ask for pertinent NOTAMs prior to flight.

COMMON TRAFFIC ADVISORY FREQUENCY (CTAF) (USA) — A frequency designed for the purpose of carrying out airport advisory practices while operating to or from an uncontrolled airport. The CTAF may be a UNICOM, Multicom, FSS, or tower frequency.

COMMUNITY AERODROME RADIO STATION (CARS) — An aerodrome radio that provides weather, field conditions, accepts flight plans and position reports.

COMPULSORY REPORTING POINTS — Reporting points which must be reported to ATC. They are designated on aeronautical charts by solid triangles or filed in a flight plan as fixes selected to define direct routes. These points are geographical locations which are defined by navigation aids/fixes. Pilots should discontinue position reporting over compulsory reporting points when informed by ATC that their aircraft is in "radar contact."

CONDITIONAL ROUTES (CDR) (Europe) — Category 1,2,3.

Category 1:	Permanently plannable CDR during designated times.
Category 2:	Plannable only during times designated in the Conditional Route Availability Message (CRAM) published at 1500Z for the 24 hour period starting at 0600Z the next day.
Category 3:	Not plannable. Usable only when directed by ATC.

CONTROL AREA (ICAO) — A controlled airspace extending upwards from a specified limit above the earth.

CONTROLLED AIRSPACE — An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification.

NOTE: Controlled airspace is a generic term which covers ATS airspace Classes "A", "B", "C", "D", and "E".

CONTROL ZONE (ICAO) — A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

COURSE —

a. The intended direction of flight in the horizontal plane measured in degrees from north.
b. The ILS localizer signal pattern usually specified as front course or back course.
c. The intended track along a straight, curved, or segmented MLS path.

CRITICAL HEIGHT — Lowest height in relation to an aerodrome specified level below which an approach procedure cannot be continued in a safe manner solely by the aid of instruments.

DECISION ALTITUDE/HEIGHT (DA/H) (ICAO) — A specified altitude or height (A/H) in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

NOTE:

a. Decision altitude (DA) is referenced to mean sea level (MSL) and decision height (DH) is referenced to the threshold elevation.
b. The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.

DECISION HEIGHT (DH) (USA) — With respect to the operation of aircraft, means the height at which a decision must be made, during an ILS or PAR instrument approach, to either continue the approach or to execute a missed approach.

NOTE: Jeppesen approach charts use the abbreviation DA(H). The decision altitude "DA" is referenced to mean sea level (MSL) and the parenthetical decision height (DH) is referenced to the TDZE or threshold elevation. A DA(H) of 1440 ft (200 ft is a Decision Altitude of 1440 ft and a Decision Height of 200 ft.

DEPARTURE CLEARANCE VIA DATA LINK (DCL) — Provides assistance for requesting and delivering information and clearance, with the objective of reducing aircrew and controller workload. The DCL service shall be initiated by the aircrew at a suitable time between Ti and Tt where:

Ti – the earliest time at which a DCL service can be initiated;

Tt – the latest time after which an aircrew, having not completed the DCL service, is still able to receive by voice procedures and in due time, the vocal departure clearance.

The third time parameter of the DCL acknowledge procedure is T1 where:

T1 – timer implemented in the ATS ground system between the sending by ATS ground system of the DCL clearance message and the reception by it of the read-back of DCL clearance message.

DIRECT ROUTE —D — A requested route published on a Jeppesen Enroute or Area chart to assist pilots who have previous knowledge of acceptance of these routes by ATC. Use of a Direct route may require prior ATC approval and may not provide ATC or Advisory services, or be acceptable in flight plans.

DISPLACED THRESHOLD — A threshold that is located at a point on the runway other than the designated beginning of the runway.

ENROUTE FLIGHT ADVISORY SERVICE (FLIGHT WATCH) — A service specifically designed to provide, upon pilot request, timely weather information pertinent to the type of flight, intended route of flight, and altitude. The FSSs providing this service are indicated on Jeppesen Enroute and Area charts.

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CHART GLOSSARY

FAA AIR CARRIER OPERATIONS SPECIFICATIONS — Document issued to users operating under Federal Aviation Administration Regulations (FAR) Parts 121, 125, 127, 129, and 135. Operations Specifications are established and formalized by FARs. The primary purpose of FAA Air Carrier Operations Specifications is to provide a legally enforceable means of prescribing an authorization, limitation and/or procedures for a specific operator. Operations Specifications are subject to expeditious changes. These changes are usually too time critical to adopt through the regulatory process.

FEEDER FIX — The fix depicted on instrument approach procedure charts which establishes the starting point of the feeder route.

FEEDER ROUTE — Routes depicted on instrument approach procedure charts to designate routes for aircraft to proceed from the enroute structure to the initial approach fix (IAF).

FINAL APPROACH COURSE — A published MLS course, a straight line extension of a localizer, a final approach radial/bearing, or a runway centerline all without regard to distance.

FINAL APPROACH (ICAO) — That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,

a. at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or

b. at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:

   1. a landing can be made; or
   2. a missed approach procedure is initiated.

FINAL APPROACH FIX (FAF) — The fix from which the final approach (IFR) to an airport is executed and which identifies the beginning of the final approach segment. It is designated in the profile view of Jeppesen Terminal charts by the Maltese Cross symbol for non-precision approaches and by the glide slope/path intercept point on precision approaches. The glide slope/path symbol starts at the FAF. When ATC directs a lower-than-published Glide Slope/Path Intercept Altitude, it is the resultant actual point of the glide slope/path intercept.

FINAL APPROACH FIX (FAF) (AUSTRALIA) — A specified point on a non-precision approach which identifies the commencement of the final segment. The FAF is designated in the profile view of Jeppesen Terminal charts by the Maltese Cross symbol.

FINAL APPROACH — IFR (USA) — The flight path of an aircraft which is inbound to an airport on a final instrument approach course, beginning at the final approach fix or point and extending to the airport or the point where a circle-to-land maneuver or a missed approach is executed.

FINAL APPROACH POINT (FAP) (USA) — The point, applicable only to a non-precision approach with no depicted FAF (such as an on-airport VOR), where the aircraft is established inbound on the final approach course from the procedure turn and where the final approach descent may be commenced. The FAP serves as the FAF and identifies the beginning of the final approach segment.

FINAL APPROACH FIX OR POINT (FAP) (ICAO) — That fix or point of an instrument approach procedure where the final approach segment commences.

FINAL APPROACH POINT (FAP) (AUSTRALIA) — A specified point on the glide path of a precision instrument approach which identifies the commencement of the final segment.

NOTE: The FAP is co-incident with the FAF of a localizer-based non-precision approach.

FLIGHT INFORMATION REGION (FIR, UIR) — An airspace of defined dimensions within which Flight Information Service and Alerting Service are provided.

a. Flight Information Service (FIS) — A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

b. Alerting Service — A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

FLIGHT WATCH (USA) — A shortened term for use in air-ground contacts to identify the flight service station providing Enroute Flight Advisory Service; e.g., “Oakland Flight Watch.”

FLY-BY WAYPOINT — A fly-by waypoint requires the use of turn anticipation to avoid overshoot of the next flight segment.

FLY-OVER WAYPOINT — A fly-over waypoint precludes any turn until the waypoint is overflown and is followed by an intercept maneuver of the next flight segment.

GLIDE PATH (ICAO) — A descent profile determined for vertical guidance during a final approach.

GLIDE SLOPE (GS) (USA) — Provides vertical guidance for aircraft during approach and landing. The glide slope/glidepath is based on the following:

a. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS/MLS; or

b. Visual ground aids, such as VASI, which provide vertical guidance for a VFR approach or for the visual portion of an instrument approach and landing.

c. PAR, used by ATC to inform an aircraft making a PAR approach of its vertical position (elevation) relative to the descent profile.

GLIDE SLOPE / GLIDE PATH INTERCEPT ALTITUDE — The minimum altitude to intercept the glide slope/path on a precision approach. The intersection of the published intercept altitude with the glide slope/path, designated on Jeppesen Terminal charts by the start of the glide slope/path symbol, is the precision FAF; however, when ATC directs a lower altitude, the resultant lower intercept position is then the FAF.

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CHART GLOSSARY

GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) — An "umbrella" term adopted by the International Civil Aviation Organization (ICAO) to encompass any independent satellite navigation system used by a pilot to perform onboard position determinations from the satellite data.

GLOBAL POSITIONING SYSTEM (GPS) — A space-based radio positioning, navigation, and time-transfer system. The system provides highly accurate position and velocity information, and precise time, on a continuous global basis, to an unlimited number of properly equipped users. The system is unaffected by weather, and provides a worldwide common grid reference system. The GPS concept is predicated upon accurate and continuous knowledge of the spatial position of each satellite in the system with respect to time and distance from a transmitting satellite to the user. The GPS receiver automatically selects appropriate signals from the satellites in view and translates these into a three-dimensional position, velocity, and time. System accuracy for civil users is normally 100 meters horizontally.

GRID MINIMUM OFFROUTE ALTITUDE (Grid MORA) — An altitude derived by Jeppesen or provided by State Authorities. The Grid MORA altitude provides terrain and man-made structure clearance within the section outlined by latitude and longitude lines. MORA does not provide for navaid signal coverage or communication coverage.

a. Grid MORA values derived by Jeppesen clear all terrain and man-made structures by 1000 feet in areas where the highest elevations are 5000 feet MSL or lower. MORA values clear all terrain and man-made structures by 2000 feet in areas where the highest elevations are 5001 feet MSL or higher. When a Grid MORA is shown as "Unsurveyed" it is due to incomplete or insufficient information. Grid MORA values followed by a +/- denote doubtful accuracy, but are believed to provide sufficient reference point clearance.

b. Grid MORA (State) altitude supplied by the State Authority provides 2000 feet clearance in mountainous areas and 1000 feet in non-mountainous areas.

GROUND COMMUNICATIONS OUTLET (GCO) (USA) — An unstaffed, remotely controlled ground / ground communications facility. Pilots at uncontrolled airports may contact ATC and FSS via VHF to a telephone connection to obtain an instrument clearance or close a VFR or IFR flight plan. They may also get an updated weather briefing prior to takeoff. Pilots will use four "key clicks" on the VHF radio to contact the appropriate ATC facility, or six "key clicks" to contact FSS. The GCO system is intended to be used only on the ground.

HEIGHT ABOVE AIRPORT (HAA) — The height of the Minimum Descent Altitude (MDA) above the published airport elevation. This is published in conjunction with circling minimums.

HEIGHT ABOVE TOUCHDOWN (HAT) — The height of the Decision Height or Minimum Descent Altitude above the highest runway elevation in the touchdown zone of the runway. HAT is published on instrument approach charts in conjunction with all straight-in minimums.

HIGH FREQUENCY COMMUNICATIONS — High radio frequencies (HF) between 3 and 30 MHz used for air-to-ground voice communication in overseas operations.

HIGH SPEED TAXIWAY / TURNOFF (HST) — A long radius taxiway designed and provided with lighting or marking to define the path of an aircraft, traveling at high speed (up to 60 knots), from the runway center to a point on the center of a taxiway. Also referred to as long radius exit or turnoff taxiway. The high speed taxiway is designed to expedite aircraft turning off the runway after landing, thus reducing runway occupancy time.

HOLD / HOLDING PROCEDURE — A predetermined maneuver which keeps aircraft within a specified airspace while awaiting further clearance from air traffic control. Also used during ground operations to keep aircraft within a specified area or at a specified point while awaiting further clearance from air traffic control.

ILS CATEGORIES (ICAO) —

a. ILS Category I — An ILS approach procedure which provides for an approach to a decision height not lower than 200 feet (60m) and a visibility not less than 2400 feet (800m) or a runway visual range not less than 1800 feet (550m).

b. ILS Category II (Special authorization required) — An ILS approach procedure which provides for an approach to a decision height lower than 200 feet (60m) but not lower than 100 feet (30m) and a runway visual range not less than 1200 feet (350m).

c. ILS Category III (Special authorization required) —

   1. IIIA — An ILS approach procedure which provides for approach with either a decision height lower than 100 feet (30m) or with no decision height and with a runway visual range of not less than 700 feet (200m).
   2. IIIB — An ILS approach procedure which provides for approach with either a decision height lower than 50 feet (15m) or with no decision height and with a runway visual range of less than 700 feet (200m) but not less than 150 feet (50m).
   3. IIIC — An ILS approach procedure which provides for approach with no decision height and no runway visual range limitations.

d. Some areas require special authorization for ILS Category I approaches. In these areas, an additional category of approach called ILS is available without special authorization. These ILS approaches have minimums higher than a decision height of 200 feet and a runway visual range value of 2600 feet. Jeppesen approach charts, at these locations, will have a notation in the chart heading or in the minimum box titles.

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CHART GLOSSARY

ILS CATEGORIES (USA) —

a. ILS Category I — An ILS approach procedure which provides for approach to a height above touchdown of not less than 200 feet and with runway visual range of not less than 1800 feet.

b. ILS Category II — An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1200 feet.

c. ILS Category III —

1. IIIA — An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 700 feet.
2. IIIB — An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 150 feet.
3. IIIC — An ILS approach procedure which provides for approach without a decision height minimum and without runway visual range minimum.

INSTRUMENT DEPARTURE PROCEDURE (DP) (USA) — A preplanned instrument flight rule (IFR) air traffic control departure procedure printed for pilot use in graphic and/or textual form. DPs provide transition from the terminal to the appropriate enroute structure.

INTERNATIONAL AIRPORT (ICAO) — Any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

INTERNATIONAL AIRPORT (USA) — Relating to international flight, it means:

a. An airport of entry which has been designated by the Secretary of Treasury or Commissioner of Customs as an international airport for customs service.

b. A landing rights airport at which specific permission to land must be obtained from customs authorities in advance of contemplated use.

c. Airports designated under the Convention on International Civil Aviation as an airport for use by international air transport and/or international general aviation.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) — A specialized agency of the United Nations whose objective is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport.

LAND AND HOLD SHORT OPERATIONS — Operations which include simultaneous takeoffs and landings and/or simultaneous landings when a landing aircraft is able and is instructed by the controller to hold short of the intersecting runway / taxiway or designated hold short point. Pilots are expected to promptly inform the controller if the hold short clearance cannot be accepted.

LANDING DISTANCE AVAILABLE (LDA) (ICAO) — The length of runway which is declared available and suitable for the ground run of an airplane landing.

LATERAL NAVIGATION (LNAV) — LNAV minimums are for lateral navigation only, and the approach minimum altitude will be published as a minimum descent altitude (MDA). LNAV provides the same level of service as the present GPS stand-alone approaches. LNAV minimums support the following navigation systems: WAAS, when the navigation solution will not support vertical navigation; and, GPS navigation systems which are presently authorized to conduct GPS/GNSS approaches.

LATERAL NAVIGATION / VERTICAL NAVIGATION (LNAV/VNAV) — Identifies APV minimums developed to accommodate an RNAV IAP with vertical guidance, usually provided by approach certified Baro-VNAV, but with lateral and vertical integrity limits larger than a precision approach or LPV. LNAV stands for Lateral Navigation; VNAV stands for Vertical Navigation. These minimums can be flown by aircraft with a statement in the Aircraft Flight Manual (AFM) that the installed equipment supports GPS approaches and has an approach-approved barometric VNAV, or if the aircraft has been demonstrated to support LNAV/VNAV approaches. This includes Class 2, 3 and 4 TSO-C146 WAAS equipment. Aircraft using LNAV/VNAV minimums will descend to landing via an internally generated descent path based on satellite or other approach approved VNAV systems. WAAS equipment may revert to this mode of operation when the signal does not support "precision" or LPV integrity. Since electronic vertical guidance is provided, the approach minimum altitude will be published as a decision altitude (DA).

LOCAL AIRPORT ADVISORY (LAA) — A service provided by flight service stations or the military at airports not serviced by an operating control tower. This service consists of providing information to arriving and departing aircraft concerning wind direction and speed, favored runway, altimeter setting, pertinent known traffic, pertinent known field conditions, airport taxi routes and traffic patterns, and authorized instrument approach procedures. This information is advisory in nature and does not constitute an ATC clearance.

LOCALIZER PERFORMANCE WITH VERTICAL GUIDANCE (LPV) — Identifies the APV minimums that incorporate electronic lateral and vertical guidance. The lateral guidance is equivalent to localizer, and the protected area is considerably smaller than the protected area for the present LNAV and LNAV/VNAV lateral protection. Aircraft can fly these minimums with a statement in the Aircraft Flight Manual (AFM) that the installed equipment supports LPV approaches. This includes Class 3 and 4 TSO-C146 WAAS equipment, and future LAAS equipment.

LOW ALTITUDE AIRWAY STRUCTURE / FEDERAL AIRWAYS (USA) — The network of airways serving aircraft operations up to but not including 18,000 feet MSL.

LOW FREQUENCY (LF) — The frequency band between 30 and 300 kHz.

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CHART GLOSSARY

MAGNETIC VARIATION — The orientation of a horizontal magnetic compass with respect to true north. Because there is a continuous small change of direction of lines of magnetic force over the surface of the earth, magnetic variation at most locations is not constant over long periods of time.

MANDATORY ALTITUDE — An altitude depicted on an instrument approach procedure chart requiring the aircraft to maintain altitude at the depicted value.

MANDATORY FREQUENCY (MF) — A frequency designated at selected airports that are uncontrolled during certain hours only. Aircraft operating within the designated MF Area, normally 5 NM radius of the airport, must be equipped with a functioning radio capable of maintaining two-way communications. Jeppesen charts list the MF frequency and the area when other than the standard 5 NM.

MAXIMUM AUTHORIZED ALTITUDE (MAA) — A published altitude representing the maximum usable altitude or flight level for an airspace structure or route segment.

MEDIUM FREQUENCY (MF) — The frequencies between 300 kHz and 3 MHz.

MINIMUM CROSSING ALTITUDE (MCA) — The lowest altitude at certain fixes at which an aircraft must cross when proceeding in the direction of a higher minimum enroute IFR altitude (MEA).

MINIMUM DESCENT ALTITUDE/HEIGHT (MDA/H) (ICAO) — A specified altitude or height in a non-precision approach or circling approach below which descent may not be made without visual reference.

MINIMUM DESCENT ALTITUDE (MDA) (USA) — The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glide slope is provided.

MINIMUM ENROUTE IFR ALTITUDE (MEA) — The lowest published altitude between radio fixes that meets obstacle clearance requirements between those fixes and in many countries assures acceptable navigational signal coverage. The MEA applies to the entire width of the airway, segment, or route between the radio fixes defining the airway, segment, or route.

MINIMUM IFR ALTITUDES — Minimum altitudes for IFR operations are published on aeronautical charts for airways, routes, and for standard instrument approach procedures. Within the USA, if no applicable minimum altitude is prescribed the following minimum IFR altitudes apply.

a. In designated mountainous areas, 2000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

b. Other than mountainous areas, 1000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

c. As otherwise authorized by the Administrator or assigned by ATC.

MINIMUM OBSTRUCTION CLEARANCE ALTITUDE (MOCA) — The lowest published altitude in effect between radio fixes on VOR airways, off airway routes, or route segments which meets obstacle clearance requirements for the entire route segment and in the USA assures acceptable navigational signal coverage only within 22 nautical miles of a VOR.

MINIMUM OFF-ROUTE ALTITUDE (MORA) — This is an altitude derived by Jeppesen. The MORA provides known obstruction clearance 10 NM either side of the route centerline including a 10 NM radius beyond the radio fix reporting or mileage break defining the route segment. For terrain and man-made structure clearance refer to Grid MORA.

MINIMUM RECEPTION ALTITUDE (MRA) — The lowest altitude at which an intersection can be determined.

MINIMUM SAFE ALTITUDE (MSA) — Altitude depicted on an instrument approach chart and identified as the minimum safe altitude which provides 1000 feet of obstacle clearance within a 25 NM radius from the navigational facility upon which the MSA is predicated. If the radius limit is other than 25 NM, it is stated. This altitude is for EMERGENCY USE ONLY and does not necessarily guarantee navaid reception. When the MSA is divided into sectors, with each sector a different altitude, the altitudes in these sectors are referred to as “minimum sector altitudes”.

MINIMUM SECTOR ALTITUDE (MSA) (ICAO) — The lowest altitude that may be used under emergency conditions that provides a minimum clearance of 300 meters (1000 feet) above all obstacles within a sector of a circle of 46 kilometers (25 NM) centered on a navigational aid.

MINIMUM VECTORING ALTITUDE (MVA) — The lowest MSL altitude at which an IFR aircraft will be vectored by a radar controller, except as otherwise authorized for radar approaches, departures and missed approaches. The altitude meets IFR obstacle clearance criteria. It may be lower than the published MEA along an airway of J-route segment. It may be utilized for radar vectoring only upon the controller"s determination that an adequate radar return is being received from the aircraft being controlled. Charts depicting minimum vectoring altitudes are normally available only to the controllers, not to pilots.

MISSED APPROACH —

a. A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. The route of flight and altitude are shown on instrument approach procedure charts. A pilot executing a missed approach prior to the Missed Approach Point (MAP) must continue along the final approach to the MAP. The pilot may climb immediately to the altitude specified in the missed approach procedure.

b. A term used by the pilot to inform ATC that he/she is executing the missed approach.

c. At locations where ATC radar service is provided the pilot should conform to radar vectors, when provided by ATC, in lieu of the published missed approach procedure.

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CHART GLOSSARY

MISSED APPROACH POINT (MAP) (ICAO) — That point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed.

MISSED APPROACH POINT (MAP) (USA) — A point prescribed in each instrument approach procedure at which a missed approach procedure shall be executed if the required visual reference does not exist.

MOUNTAINOUS AREA (ICAO) — An area of changing terrain profile where the changes of terrain elevation exceed 3000 feet (900m) within a distance of 10 NM.

NON-PRECISION APPROACH PROCEDURE — A standard instrument approach procedure in which no electronic glideslope is provided; e.g., VOR, TACAN, NDB, LOC, ASR, LDA, or SDF approaches.

NO PROCEDURE TURN (NoPT) — No procedure turn is required nor authorized.

OBSTACLE CLEARANCE ALTITUDE (HEIGHT) OCA(H) (ICAO) — The lowest altitude (OCA), or alternatively the lowest height above the elevation of the relevant runway threshold or above the aerodrome elevation as applicable (OCH), used in establishing compliance with the appropriate obstacle clearance criteria.

OBSTRUCTION CLEARANCE LIMIT (OCL) — The height above aerodrome elevation below which the minimum prescribed vertical clearance cannot be maintained either on approach or in the event of a missed approach.

PILOT CONTROLLED LIGHTING (PCL) (USA) — (For other states see Air Traffic Control Rules and Procedures.)

Radio control of lighting is available at selected airports to provide airborne control of lights by keying the aircraft's microphone. The control system consists of a 3-step control responsive to 7, 5, and/or 3 microphone clicks. The 3-step and 2-step lighting facilities can be altered in intensity. All lighting is illuminated for a period of 15 minutes (except for 1-step and 2-step REILs which may be turned off by keying the mike 5 or 3 times, respectively).

Suggested use is to always initially key the mike 7 times; this assures that all controlled lights are turned on to the maximum available intensity. If desired, adjustment can then be made, where the capability is provided, to a lower intensity (or the REIL turned off) by keying the mike 5 and/or three times. Approved lighting systems may be activated by keying the mike as indicated below:

KEY MIKE	FUNCTION
7 times within 5 seconds	Highest intensity available
5 times within 5 seconds	Medium or lower intensity (Lower REIL or REIL Off)
3 times within 5 seconds	Lowest intensity available (Lower REIL or REIL Off)

Due to the close proximity of airports using the same frequency, radio controlled lighting receivers may be set at a low sensitivity requiring the aircraft to be relatively close to activate the system. Consequently, even when lights are on, always key mike as directed when overflying an airport of intended landing or just prior to entering the final segment of an approach. This will assure the aircraft is close enough to activate the system and a full 15 minutes lighting duration is available.

PITCH POINT — A fix/waypoint that serves as a transition point from a departure procedure or the low altitude ground-based navigation structure into the high altitude waypoint system.

PRECISION APPROACH PROCEDURE — A standard instrument approach procedure in which an electronic glideslope/glidepath is provided; e.g., ILS, MLS, PAR.

PRE-DEPARTURE CLEARANCE (PDC) — An automated Clearance Delivery system relaying ATC departure clearances from the FAA to the user network computer for subsequent delivery to the cockpit via ACARS (Airline/Aviation VHF data link) where aircraft are appropriately equipped, or to gate printers for pilot pickup.

PROCEDURE ALTITUDES — Are recommended altitudes developed in coordination with Air Traffic Control requirements to accommodate a stabilized descent profile on a prescribed descent angle on the final approach course and sometimes also in the intermediate approach segment. Procedure altitudes are never less than segment minimum safe altitudes.

PROCEDURE TURN (PT) (ICAO) — A maneuver in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track.

NOTE:

a. Procedure turns are designated "left" or "right" according to the direction of the initial turn.

b. Procedure turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual approach procedure.

PROCEDURE TURN (PT) (USA) — The maneuver prescribed when it is necessary to reverse direction to establish an aircraft on the intermediate approach segment or final approach course. The outbound course, direction of turn, distance within which the turn must be completed, and minimum altitude are specified in the procedure. However, unless otherwise restricted, the point at which the turn may be commenced and the type and rate of turn are at the discretion of the pilot.

PROCEDURE TURN INBOUND — That point of a procedure turn maneuver where course reversal has been completed and an aircraft is established inbound on the intermediate approach segment or final approach course. A report of "procedure turn inbound" is normally used by ATC as a position report for separation purposes.

QFE — Height above airport elevation (or runway threshold elevation) based on local station pressure.

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CHART GLOSSARY

QNE — Altimeter setting 29.92 inches of mercury, 1013.2 hectopascals or 1013.2 millibars.

QNH — Altitude above mean sea level based on local station pressure.

RACETRACK PROCEDURE (ICAO) — A procedure designed to enable the aircraft to reduce altitude during the initial approach segment and/or establish the aircraft inbound when the entry into a reversal procedure is not practical.

RADAR WEATHER ECHO INTENSITY LEVELS — Existing radar systems cannot detect turbulence. However, there is a direct correlation between the degree of turbulence and other weather features associated with thunderstorms and the radar weather echo intensity. The National Weather Service has categorized radar weather echo intensity for precipitation into six levels. These levels are sometimes expressed during communications as "VIP LEVEL" 1 through 6 (derived from the component of the radar that produces the information — Video Integrator and Processor). The following list gives the "VIP LEVELS" in relation to the precipitation intensity within a thunderstorm:

Level 1.	WEAK
Level 2.	MODERATE
Level 3.	STRONG
Level 4.	VERY STRONG
Level 5.	INTENSE
Level 6.	EXTREME

RADIO ALTIMETER / RADAR ALTIMETER — Aircraft equipment which makes use of the reflection of radio waves from the ground to determine the height of the aircraft above the surface.

RAPID EXIT TAXIWAY (ICAO) — A taxiway connected to a runway at an acute angle and designed to allow landing airplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.

REDUCED VERTICAL SEPARATION MINIMUMS (RVSM) — A reduction in the vertical separation between flight levels 290 – 410 from 2000 to 1000 feet.

REQUIRED NAVIGATION PERFORMANCE (RNP) — A statement of navigation position accuracy necessary for operation within a defined airspace. RNP is performance-based and not dependent on a specific piece of equipment. RNP includes a descriptive number, the value being an indicator of the size of the containment area (e.g., RNP-0.3, RNP-1, RNP-3, etc.). The different values are assigned to terminal, departure, and enroute operations. Some aircraft have RNP approval in their AFM without a GPS sensor. The lowest level of sensors that the FAA will support for RNP service is DME/DME. However, necessary DME signal may not be available at the airport of intended operations. For those locations having an RNAV chart published with LNAV/VNAV minimums, a procedure note may be provided such as "DME/DME RNP-0.3 NA." This means that RNP aircraft dependent on DME/DME to achieve RNP-0.3 are not authorized to conduct this approach. Where DME facility availability is a factor, the note may read "DME/DME RNP-0.3 authorized; ABC and XYZ required." This means that ABC and XYZ facilities have been determined by flight inspection to be required in the navigation solution to assure RNP-0.3. VOR/DME updating must not be used for approach procedures.

RNAV APPROACH — An instrument approach procedure which relies on aircraft area navigation equipment for navigation guidance.

ROUTE MINIMUM OFFROUTE ALTITUDE (Route MORA) — This is an altitude derived by Jeppesen. The Route MORA altitude provides reference point clearance within 10 NM of the route centerline (regardless of the route width) and end fixes. Route MORA values clear all reference points by 1000 feet in areas where the highest reference points are 5000 feet MSL or lower. Route MORA values clear all reference points by 2000 feet in areas where the highest reference points are 5001 feet MSL or higher. When a Route MORA is shown along a route as "unknown" it is due to incomplete or insufficient information.

RUNWAY EDGE LIGHTS (ICAO) — Are provided for a runway intended for use at night or for a precision approach runway intended for use by day or night. Runway edge lights shall be fixed lights showing variable white, except that:

a. in the case of a displaced threshold, the lights between the beginning of the runway and the displaced threshold shall show red in the approach direction; and

b. a section of the lights 600m or one-third of the runway length, whichever is the less, at the remote end of the runway from the end at which the takeoff run is started, may show yellow.

RUNWAY EDGE LIGHTS (USA) — Lights used to outline the edges of runways during periods of darkness or restricted visibility conditions. The light systems are classified according to the intensity or brightness they are capable of producing: they are the High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL), and the Low Intensity Runway Lights (RL). The HIRL and MIRL systems have variable intensity controls, where the RLs normally have one intensity setting.

a. The runway edge lights are white, except on instrument runways amber replaces white on the last 2000 feet or half of the runway length, whichever is less, to form a caution zone for landings.

b. The lights marking the ends of the runway emit red light toward the runway to indicate the end of runway to a departing aircraft and emit green outward from the runway end to indicate the threshold to landing aircraft.

RUNWAY MARKINGS —

a. Basic marking — Markings on runways used for operations under visual flight rules consisting of centerline markings and runway direction numbers and, if required, letters.

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CHART GLOSSARY

b. Instrument marking — Markings on runways served by nonvisual navigation aids and intended for landings under instrument weather conditions, consisting of basic marking plus threshold markings.

c. All-weather (precision instrument) marking — Marking on runways served by nonvisual precision approach aids and on runways having special operational requirements, consisting of instrument markings plus landing zone markings and side strips.

SEGMENT MINIMUM ALTITUDE (SMA), or SEGMENT MINIMUM SAFE ALTITUDE (SMSA) — An altitude that provides minimum obstacle clearance in each segment of a non-precision approach. Segment minimum (safe) altitudes can be considered "do not descend below" altitudes and can be lower than *procedure* altitudes which are specifically developed to facilitate a constant rate or stabilized descent.

SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE — An instrument approach procedure may have as many as four separate segments depending on how the approach procedure is structured.

ICAO —

a. Initial Approach — That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.

b. Intermediate Approach — That segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, race track or dead reckoning track procedure and the final approach fix or point, as appropriate.

c. Final Approach — That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

d. Missed Approach Procedure — The procedure to be followed if the approach cannot be continued.

USA —

a. Initial Approach — The segment between the initial approach fix and the intermediate fix or the point where the aircraft is established on the intermediate course or final course.

b. Intermediate Approach — The segment between the intermediate fix or point and the final approach fix.

c. Final Approach — The segment between the final approach fix or point and the runway, airport or missed approach point.

d. Missed Approach — The segment between the missed approach point, or point of arrival at decision height, and the missed approach fix at the prescribed altitude.

SELECTIVE CALL SYSTEM (SELCAL) — A system which permits the selective calling of individual aircraft over radiotelephone channels linking a ground station with the aircraft.

SIDESTEP MANEUVER — A visual maneuver accomplished by a pilot at the completion of an instrument approach to permit a straight-in landing on a parallel runway not more than 1200 feet to either side of the runway to which the instrument approach was conducted.

SPECIAL USE AIRSPACE — Airspace of defined dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Types of special use airspace are:

a. Alert Area (USA) — Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft. Alert Areas are depicted on aeronautical charts for the information of nonparticipating pilots. All activities within an Alert Area are conducted in accordance with Federal Aviation Regulations, and pilots of participating aircraft as well as pilots transiting the area are equally responsible for collision avoidance.

b. Controlled Firing Area (USA) — Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons and property on the ground.

c. Military Operations Area (MOA) (USA) — A MOA is airspace established outside of a Class "A" airspace area to separate or segregate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted.

d. Prohibited Area — Airspace designated under FAR Part 73 within which no person may operate an aircraft without the permission of the using agency.

e. Restricted Area (USA) — Airspace designated under Part 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use and IFR/VFR operations in the area may be authorized by the controlling ATC facility when it is not being utilized by the using agency. Restricted areas are depicted on enroute charts. Where joint use is authorized, the name of the ATC controlling facility is also shown.

f. Restricted Area (ICAO) — An airspace of defined dimensions, above the land areas or territorial waters of a state, within which the flight of aircraft is restricted in accordance with certain specified coordinates.

g. Warning Area — A warning area is airspace of defined dimensions from 3 nautical miles outward from the coast of the United States, that contains activity that may be hazardous to nonparticipating aircraft. The purpose of such warning areas is to warn nonparticipating pilots of the potential danger. A warning area may be located over domestic or international waters or both.

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CHART GLOSSARY

STANDARD INSTRUMENT ARRIVAL (STAR) (ICAO) — A designated instrument flight rule (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced.

STANDARD INSTRUMENT DEPARTURE (SID) (ICAO) — A designated instrument flight rule (IFR) departure route linking the aerodrome or a specified runway of the aerodrome with a specified point, normally on a designated ATS route, at which the enroute phase of a flight commences.

STANDARD INSTRUMENT DEPARTURE (SID) (USA) — A preplanned instrument flight rule (IFR) air traffic control departure procedure printed for pilot use in graphic and/or textual form. SIDs provide transition from the terminal to the appropriate enroute structure.

STANDARD TERMINAL ARRIVAL ROUTE (STAR) (USA) — A preplanned instrument flight rule (IFR) air traffic control arrival procedure published for pilot use in graphic and/or textual form. STARs provide transition from the enroute structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.

STATION DECLINATION — The orientation with respect to true north of VHF transmitted signals. The orientation is originally made to agree with the magnetic variation (an uncontrollable global phenomenon) at the site. Hence station declination (fixed by man) may differ from changed magnetic variation until the station is reoriented.

SUBSTITUTE ROUTE — A route assigned to pilots when any part of an airway or route is unusable because of navaid status.

SUNSET AND SUNRISE — The mean solar times of sunset and sunrise as published in the Nautical Almanac, converted to local standard time for the locality concerned. Within Alaska, the end of evening civil twilight and the beginning of morning civil twilight, as defined for each locality.

SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM (SMGCS) (USA) — Provisions for guidance and control or regulation for facilities, information, and advice necessary for pilots of aircraft and drivers of ground vehicles to find their way on the airport during low visibility operations and to keep the aircraft or vehicles on the surfaces or within the areas intended for their use. Low visibility operations for this system means reported conditions of RVR 1200 or less.

SURVEILLANCE APPROACH (ASR) — An instrument approach wherein the air traffic controller issues instructions, for pilot compliance, based on aircraft position in relation to the final approach course (azimuth), and the distance (range) from the end of the runway as displayed on the controller's radar scope. The controller will provide recommended altitudes on final approach if requested by the pilot.

TAKE-OFF DISTANCE AVAILABLE (TODA) (ICAO) — The length of the takeoff run available plus the length of the clearway, if provided.

TAKE-OFF RUN AVAILABLE (TORA) (ICAO) — The length of runway declared available and suitable for the ground run of an airplane taking off.

TERMINAL CONTROL AREA (ICAO) — A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes.

TERMINAL ARRIVAL AREA (FAA) / TERMINAL AREA ALTITUDE (ICAO) (TAA) — Provides a seamless and efficient transition from the enroute structure to the terminal environment to an underlying RNAV instrument approach procedure for FMS and/or GPS equipped aircraft. Minimum altitudes depict standard obstacle clearances compatible with the associated instrument approach procedure. TAAs will not be found on all RNAV procedures, particularly in areas with a heavy concentration of air traffic. When the TAA is published, it replaces the MSA for that approach procedure. A standard racetrack holding pattern may be provided at the center IAF, and if present may be necessary for course reversal and for altitude adjustment for entry into the procedure. In the latter case, the pattern provides an extended distance for the descent as required by the procedure. The published procedure will be annotated to indicate when the course reversal is not necessary when flying within a particular TAA (e.g., "NoPT"). Otherwise, the pilot is expected to execute the course reversal under the provisions of 14 CFR Section 91.175 (USA). The pilot may elect to use the course reversal pattern when it is not required by the procedure, but must inform air traffic control and receive clearance to do so.

TERMINAL VFR RADAR SERVICE (USA) — A national program instituted to extend the terminal radar services provided instrument flight rules (IFR) aircraft to visual flight rules (VFR) aircraft. The program is divided into four types of service referred to as basic radar service, terminal radar service area (TRSA) service, Class "B" service and Class "C" service.

a. Basic Radar Service — These services are provided for VFR aircraft by all commissioned terminal radar facilities. Basic radar service includes safety alerts, traffic advisories, limited radar vectoring when requested by the pilot, and sequencing at locations where procedures have been established for this purpose and/or when covered by a letter of agreement. The purpose of this service is to adjust the flow of arriving IFR and VFR aircraft into the traffic pattern in a safe and orderly manner and to provide traffic advisories to departing VFR aircraft.

b. TRSA Service — This service provides, in addition to basic radar service, sequencing of all IFR and participating VFR aircraft to the primary airport and separation between all participating VFR aircraft. The purpose of this service is to provide separation between all participating VFR aircraft and all IFR aircraft operating within the area defined as a TRSA.

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CHART GLOSSARY

c. Class "B" Service — This service provides, in addition to basic radar service, approved separation of aircraft based on IFR, VFR, and/or weight, and sequencing of VFR arrivals to the primary airport(s).

d. Class "C" Service — This service provides, in addition to basic radar service, approved separation between IFR and VFR aircraft, and sequencing of VFR aircraft, and sequencing of VFR arrivals to the primary airport.

TERMINAL RADAR SERVICE AREA (TRSA) (USA) — Airspace surrounding designated airports wherein ATC provides radar vectoring, sequencing and separation on a full-time basis for all IFR and participating VFR aircraft. Service provided in a TRSA is called Stage III Service. Pilots' participation is urged but is not mandatory.

THRESHOLD — The beginning of that portion of the runway usable for landing.

THRESHOLD CROSSING HEIGHT — The theoretical height above the runway threshold at which the aircraft's glideslope antenna would be if the aircraft maintains the trajectory established by the mean ILS glideslope or MLS glidepath.

TOUCHDOWN ZONE ELEVATION (TDZE) — The highest elevation in the first 3000 feet of the landing surface.

TRANSITION ALTITUDE (QNH) — The altitude in the vicinity of an airport at or below which the vertical position of an aircraft is controlled by reference to altitudes (MSL).

TRANSITION HEIGHT (QFE) — The height in the vicinity of an airport at or below which the vertical position of an aircraft is expressed in height above the airport reference datum.

TRANSITION LAYER — The airspace between the transition altitude and the transition level. Aircraft descending through the transition layer will use altimeters set to local station pressure, while departing aircraft climbing through the layer will be using standard altimeter setting (QNE) of 29.92 inches of Mercury, 1013.2 millibars, or 1013.2 hectopascals.

TRANSITION LEVEL (QNE) — The lowest flight level available for use above the transition altitude.

TURN ANTICIPATION — Turning maneuver initiated prior to reaching the actual airspace fix or turn point that is intended to keep the aircraft within established airway or route boundaries.

VERTICAL NAVIGATION (VNAV) — That function of RNAV equipment which provides guidance in the vertical plane.

VERTICAL PATH ANGLE (VPA) (USA) — The descent angle shown on some non-precision approaches describing the geometric descent path from the Final approach fix (FAF), or on occasion from an intervening stepdown fix, to the Threshold Crossing Height (TCH). This angle may or may not coincide with the angle projected by a Visual Glide Slope Indicator (VASI, PAPI, PLASI, etc.)

VISIBILITY (ICAO) — The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night.

a. Flight Visibility — The visibility forward from the cockpit of an aircraft in flight.

b. Ground Visibility — The visibility at an aerodrome as reported by an accredited observer.

c. Runway Visual Range (RVR) — The range over which the pilot of an aircraft on the centerline of a runway can see the runway surface markings or the lights delineating the runway or identifying its centerline.

VISIBILITY (USA) — The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night. Visibility is reported as statute or nautical miles, hundreds of feet or meters.

a. Flight Visibility — The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.

b. Ground Visibility — Prevailing horizontal visibility near the earth's surface as reported by the United States National Weather Service or an accredited observer.

c. Prevailing Visibility — The greatest horizontal visibility equaled or exceeded throughout at least half the horizon circle which need not necessarily be continuous.

d. Runway Visibility Value (RVV) — The visibility determined for a particular runway by a transmissometer. A meter provides a continuous indication of the visibility (reported in miles or fractions of miles) for the runway. RVV is used in lieu of prevailing visibility in determining minimums for a particular runway.

e. Runway Visual Range (RVR) — An instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end; it is based on the sighting of either high intensity runway lights or on the visual contrast of other targets whichever yields the greater visual range. RVR, in contrast to prevailing or runway visibility, is based on what a pilot in a moving aircraft should see looking down the runway. RVR is horizontal visual range, not slant visual range. It is based on the measurement of a transmissometer made near the touchdown point of the instrument runway and is reported in hundreds of feet. RVR is used in lieu of RVV and/or prevailing visibility in determining minimums for a particular runway.

1. Touchdown RVR — The RVR visibility readout values obtained from RVR equipment serving the runway touchdown zone.

2. Mid-RVR — The RVR readout values obtained from RVR equipment located midfield of the runway.

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CHART GLOSSARY

3. Rollout RVR — The RVR readout values obtained from RVR equipment located nearest the rollout end of the runway.

VISUAL APPROACH (ICAO) — An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to terrain.

VISUAL APPROACH (USA) — An approach conducted on an instrument flight rules (IFR) flight plan which authorizes the pilot to proceed visually and clear of clouds to the airport. The pilot must, at all times, have either the airport or the preceding aircraft in sight. This approach must be authorized and under the control of the appropriate air traffic control facility. Reported weather at the airport must be ceiling at or above 1000 feet and visibility of 3 miles or greater.

VISUAL DESCENT POINT (VDP) — 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, provided the approach threshold of that runway, or approach lights, or other markings identifiable with the approach end of that runway are clearly visible to the pilot.

VOLMET BROADCAST — Routine broadcast of meteorological information for aircraft in flight.

WAYPOINT — A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation.

WEATHER SYSTEMS PROCESSOR (WSP) — An add-on weather processor to selected Airport Surveillance Radar (ASR)-9 facilities that adds Doppler weather radar capability and provides wind shear and microburst warnings. The system gives controllers timely and accurate warnings for relaying to pilots via radio communications. The WSP also provides controllers with thunderstorm cell locations and movement as well as the predicted future position and intensity of wind shifts that may affect airport operations. The system can also process precipitation data to reduce false severe weather reports caused by anomalous propagation.

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ABBREVIATIONS USED IN AIRWAY MANUAL

DEFINITIONS

A/A	Air to Air
AAF	Army Air Field
AAIM	Aircraft Autonomous Integrity Monitoring
AAIS	Automated Aerodrome Information Service
AAL	Above Aerodrome Level
AAS	Airport Advisory Service
AB	Air Base
ABM	Abeam
ABN	Aerodrome Beacon
AC	Air Carrier
ACA	Arctic Control Area
ACA	Approach Control Area
ACAS	Airborne Collision Avoidance System
ACARS	Airborne Communications Addressing and Reporting System
ACC	Area Control Center
ACFT	Aircraft
ACN	Aircraft Classification Number
AD	Aerodrome
ADA	Advisory Area
ADF	Automatic Direction Finding
ADIZ	Air Defense Identification Zone
ADR	Advisory Route
ADS	Automatic Dependent Surveillance
ADV	Advisory Area
AEIS	Aeronautical Enroute Information Service
AER	Approach End of Runway
AERADIO	Air Radio
AERO	Aerodrome
AF Aux	Air Force Auxiliary Field
AFB	Air Force Base
AFIS	Aerodrome Flight Information Service
AFN	American Forces Network
AFRS	Armed Forces Radio Stations
AFRU	Aerodrome Frequency Response Unit
AFS	Air Force Station
AFSS	Automated Flight Service Station
A/G	Air-to-Ground
AGL	Above Ground Level
AGNIS	Azimuth Guidance Nose-in-Stand
AH	Alert Height
AHP	Army Heliport
AIRAC	Aeronautical Information Regulation and Control
AIREP	Air-Report
AIS	Aeronautical Information Services
ALA	Aircraft Landing Area
ALF	Auxiliary Landing Field
ALT	Altitude
ALTN	Alternate
AMA	Area Minimum Altitude
AMSL	Above Mean Sea Level
ANGB	Air National Guard Base
AOE	Airport/Aerodrome of Entry
AOR	Area of Responsibility
APAPI	Abbreviated Precision Approach Path Indicator
APC	Area Positive Control
APCH	Approach
APP	Approach Control
APT	Airport
APV	Approach Procedure with Vertical Guidance
ARB	Air Reserve Base
ARINC	Aeronautical Radio, Inc.
ARO	Aerodrome Reporting Officer
ARP	Airport Reference Point
ARR	Arrival
ARTCC	Air Route Traffic Control Center
ASDA	Accelerate Stop Distance Available
ASOS	Automated Surface Observing System
ASR	Airport Surveillance Radar
ATA	Actual Time of Arrival
ATCAA	Air Traffic Control Assigned Airspace
ATCC	Air Traffic Control Center
ATCT	Air Traffic Control Tower
ATD	Actual Time of Departure
ATF	Aerodrome Traffic Frequency
ATFM	Air Traffic Flow Management
ATIS	Automatic Terminal Information Service
ATS	Air Traffic Service
ATZ	Aerodrome Traffic Zone
AUTH	Authorized
AUW	All-up Weight
AUX	Auxiliary
AVBL	Available
AWIB	Aerodrome Weather Information Broadcast
AWIS	Aerodrome Weather Information Service
AWOS	Automated Weather Observing System
AWSS	Aviation Weather Sensor System
AWY	Airway
AZM	Azimuth
Baro VNAV	Barometric Vertical Navigation
BC	Back Course

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ABBREVIATIONS USED IN AIRWAY MANUAL

BCM	Back Course Marker
BCN	Beacon
BCOB	Broken Clouds or Better
BCST	Broadcast
BDRY	Boundary
BLDG	Building
BM	Back Marker
BRG	Bearing
B-RNAV	Basic RNAV
BS	Broadcast Station (Commercial)
C	ATC IFR Flight Plan Clearance Delivery Frequency
CADIZ	Canadian Air Defense Identification Zone
CAE	Control Area Extension
CA/GRS	Certified Air/Ground Radio Service
CANPA	Constant Angle Non-Precision Approach
CARS	Community Aerodrome Radio Station
CAT	Category
CBA	Cross Border Area
CDFA	Continuous Descent Final Approach
CDI	Course Deviation Indicator
CDR	Conditional Route
CDT	Central Daylight Time
CEIL	Ceiling
CERAP	Combined Center/Radar Approach Control
CFIT	Controlled Flight Into Terrain
CGAS	Coast Guard Air Station
CGL	Circling Guidance Lights
CH	Channel
CH	Critical Height
CHGD	Changed
CL	Centerline Lights
CMNPS	Canadian Minimum Navigation Performance Specification
CNF	Computer Navigation Fix
CO	County
COMLO	Compass Locator
COMMS	Communications
CONT	Continuous
CONTD	Continued
COORDS	Coordinates
COP	Change Over Point
CORR	Corridor
CP	Command Post
CPDLC	Controller Pilot Data Link Communications
Cpt	Clearance (Pre-Taxi Procedure)
CRP	Compulsory Reporting Point
CRS	Course
CST	Central Standard Time
CTA	Control Area
CTAF	Common Traffic Advisory Frequency
CTL	Control
CTOT	Calculated Take-off Time
CTR	Control Zone
CVFP	Charted Visual Flight Procedure
CVFR	Controlled VFR
D	Day
DA	Decision Altitude
DA (H)	Decision Altitude (Height)
D-ATIS	Digital ATIS
DCL	Data Link Departure Clearance Service
DCT	Direct
DECMSND	Decommissioned
DEG	Degree
DEP	Departure Control
DEPARTURE	Departure Procedure
DER	Departure End of Runway
DEWIZ	Distance Early Warning Identification Zone
DF	Direction Finder
DISPL THRESH	Displaced Threshold
DIST	Distance
DME	Distance-Measuring Equipment
DOD	Department of Defense
DOM	Domestic
DP	Obstacle Departure Procedure
E	East or Eastern
EAT	Expected Approach Time
ECOMS	Jeppesen Explanation of Common Minimum Specifications
EDT	Eastern Daylight Time
EET	Estimated Elapsed Time
EFAS	Enroute Flight Advisory Service
EFF	Effective
EFVS	Enhanced Flight Vision System
ELEV	Elevation
EMAS	Engineered Materials Arresting System
EMERG	Emergency
ENG	Engine
EOBT	Estimated Off Block Time
EST	Eastern Standard Time
EST	Estimated
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
ETE	Estimated Time Enroute

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ABBREVIATIONS USED IN AIRWAY MANUAL

ETOPS	Extended Range Operation with two-engine airplanes
EVS	Enhanced Vision System
FAA	Federal Aviation Administration
FACF	Final Approach Course Fix
FAF	Final Approach Fix
FAIL	Failure
FANS	Future Air Navigation System
FAP	Final Approach Point
FAR	Federal Aviation Regulation
FAT	Final Approach Track
FATO	Final Approach and Take-off Area
FCP	Final Control Point
FIC	Flight Information Center
FIR	Flight Information Region
FIS	Flight Information Service
FL	Flight Level (Altitude)
FLD	Field
FLG	Flashing
FLT	Flight
FM	Fan Marker
FMC	Flight Management Computer
FMS	Flight Management System
FPM	Feet Per Minute
FPR	Flight Planning Requirements
FREQ	Frequency
FSS	Flight Service Station
FT	Feet
FTS	Flexible Track System
G	Guards only (radio frequencies)
GA	General Aviation
GBAS	Ground-Based Augmentation System
GCA	Ground Controlled Approach (radar)
GCO	Ground Communication Outlet
GEN	General
GLONASS	Global Orbiting Navigation Satellite System
GLS	Global Navigation Satellite System [GNSS] Landing System
GMT	Greenwich Mean Time
GND	Ground Control
GND	Surface of the Earth (either land or water)
GNSS	Global Navigation Satellite System
GP	Glidepath
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
GS	Glide Slope
G/S	Ground Speed
GWT	Gross Weight
H	Non-Directional Radio Beacon or High Altitude
H24	24 Hour Service
HAA	Height Above Airport
HALS	High Approach Landing System
HAS	Height Above Site
HAT	Height Above Touchdown
HC	Critical Height
HDG	Heading
HF	High Frequency (3-30 MHz)
HGS	Head-up Guidance System
HI	High (altitude)
HI	High Intensity (lights)
HIALS	High Intensity Approach Light System
HIRL	High Intensity Runway Edge Lights
HIWAS	Hazardous Inflight Weather Advisory Service
HJ	Sunrise to Sunset
HN	Sunset to Sunrise
HO	By Operational Requirements
hPa	Hectopascal (one hectopascal = one millibar)
HR	Hours (period of time)
HS	During Hours of Scheduled Operations
HST	High Speed Taxiway Turn-off
HUD	Head-up Display
HUDLS	Head-Up Display Landing System
HX	No Specific Working Hours
Hz	Hertz (cycles per second)
I	Island
IAC	Instrument Approach Chart
IAF	Initial Approach Fix
IAML	Integrity Monitor Alarm
IAP	Instrument Approach Procedure
IAS	Indicated Airspeed
IATA	International Air Transport Association
IAWP	Initial Approach Waypoint
IBN	Identification Beacon
ICAO	International Civil Aviation Organization
IDENT	Identification
IF	Intermediate Fix
IFBP	Inflight Broadcast Procedure
IFR	Instrument Flight Rules
IGS	Instrument Guidance System
ILS	Instrument Landing System
IM	Inner Marker
IMAL	Integrity Monitor Alarm
IMC	Instrument Meteorological Conditions
IMTA	Intensive Military Training Area

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ABBREVIATIONS USED IN AIRWAY MANUAL

INDEFLY	Indefinitely
IN or INS	Inches
INFO	Information
INOP	Inoperative
INS	Inertial Navigation System
INT	Intersection
INTL	International
IORRA	Indian Ocean Random RNAV Area
IR	Instrument Restricted Controlled Airspace
IS	Islands
ITWS	Integrated Terminal Weather System
I/V	Instrument/Visual Controlled Airspace
JAA	Joint Aviation Authority
KGS	Kilograms
kHz	Kilohertz
KIAS	Knots Indicated Airspeed
KM	Kilometers
KMH	Kilometer(s) per Hour
KT	Knots
KTAS	Knots True Airspeed
L	Locator (Compass)
LAA	Local Airport Advisory
LAAS	Local Area Augmentation System
LACFT	Large Aircraft
LAHSO	Land and Hold Short Operations
LAT	Latitude
LBCM	Locator Back Course Marker
LBM	Locator Back Marker
LBS	Pounds (Weight)
LCG	Load Classification Group
LCN	Load Classification Number
Lctr	Locator (Compass)
LDA	Landing Distance Available
LDA	Localizer-type Directional Aid
LDI	Landing Direction Indicator
LDIN	Lead-in Light System
LGTH	Length
LIM	Locator Inner Marker
LIRL	Low Intensity Runway Lights
LLWAS	Low Level Wind Shear Alert System
LMM	Locator Middle Marker
LNAV	Lateral Navigation
LNDG	Landing
LO	Locator at Outer Marker Site
LOC	Localizer
LOM	Locator Outer Marker
LONG	Longitude
LPV	Localizer Performance with Vertical Guidance
LSALT	Lowest Safe Altitude
LT	Local Time
LTS	Lights
LVP	Low Visibility Procedures
LWIS	Limited Weather Information System
M	Meters
MAA	Maximum Authorized Altitude
MAG	Magnetic
MAHF	Missed Approach Holding Fix
MALS	Medium Intensity Approach Light System
MALSF	Medium Intensity Approach Light System with Sequenced Flashing Lights
MALSR	Medium Intensity Approach Light System with Runway Alignment Indicator Lights
MAP	Missed Approach Point
MAX	Maximum
MB	Millibars
MCA	Minimum Crossing Altitude
MCAF	Marine Corps Air Facility
MCAS	Marine Corps Air Station
MCTA	Military Controlled Airspace
MDA	Minimum Descent Altitude
MDA(H)	Minimum Descent Altitude (Height)
MDT	Mountain Daylight Time
MEA	Minimum Enroute Altitude
MEHT	Minimum Eye Height Over Threshold
MEML	Memorial
MET	Meteorological
MF	Mandatory Frequency
MFA	Minimum Flight Altitude
MHA	Minimum Holding Altitude
MHz	Megahertz
MI	Medium Intensity (lights)
MIALS	Medium Intensity Approach Light System
MIL	Military
MIM	Minimum
MIN	Minute
MIRL	Medium Intensity Runway Edge Lights
MKR	Marker Radio Beacon
MLS	Microwave Landing System
MM	Middle Marker
MNM	Minimum
MNPS	Minimum Navigation Performance Specifications
MOA	Military Operation Area
MOCA	Minimum Obstruction Clearance Altitude

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ABBREVIATIONS USED IN AIRWAY MANUAL

MORA	Minimum Off-Route Altitude (Grid or Route)
MRA	Minimum Reception Altitude
MSA	Minimum Safe/Sector Altitude
MSL	Mean Sea Level
MST	Mountain Standard Time
MTA	Military Training Area
MTAF	Mandatory Traffic Advisory Frequency
MTCA	Minimum Terrain Clearance Altitude
MTMA	Military Terminal Control Area
MTOW	Maximum Take-off Weight
MUN	Municipal
MVA	Minimum Vectoring Altitude
N	Night, North or Northern
NA	Not Authorized
NAAS	Naval Auxiliary Air Station
NADC	Naval Air Development Center
NAEC	Naval Air Engineering Center
NAF	Naval Air Facility
NALF	Naval Auxiliary Landing Field
NAP	Noise Abatement Procedure
NAR	North American Routes
NAS	Naval Air Station
NAT	North Atlantic Traffic
NAT/OTS	North Atlantic Traffic/Organized Track System
NATL	National
NAVAID	Navigational Aid
NCA	Northern Control Area
NCRP	Non-Compulsory Reporting Point
NDB	Non-Directional Beacon/Radio Beacon
NE	Northeast
NM	Nautical Mile(s)
No	Number
NoPT	No Procedure Turn
NOTAM	Notices to Airmen
NPA	Non-Precision Approach
NW	Northwest
NWC	Naval Weapons Center
O/A	On or About
OAC	Oceanic Area Control
OAS	Obstacle Assessment Surface
OCA	Oceanic Control Area
OCA (H)	Obstacle Clearance Altitude (Height)
OCL	Obstacle Clearance Limit
OCNL	Occasional
OCTA	Oceanic Control Area
ODALS	Omni-Directional Approach Light System
OM	Outer Marker
OPS	Operations or Operates
O/R	On Request
O/T	Other Times
OTR	Oceanic Transition Route
OTS	Out-of-Service
PA	Precision Approach
PAL	Pilot Activated Lighting
PANS-OPS	Procedures for Air Navigation Services - Aircraft Operations
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
PCL	Pilot Controlled Lighting
PCN	Pavement Classification Number
PCZ	Positive Control Zone
PDC	Pre-Departure Clearance
PDG	Procedure Design Gradient
PDT	Pacific Daylight Time
PERM	Permanent
PinS	Point In Space
PISTON	Piston Aircraft
PJE	Parachute Jumping Exercise
PLASI	Pulsating Visual Approach Slope Indicator
POFZ	Precision Obstacle Free Zone
PPO	Prior Permission Only
PPR	Prior Permission Required
PRA	Precision Radar Approach
PRM	Precision Radar Monitor
P-RNAV	Precision RNAV
PROC	Procedure
PROP	Propeller Aircraft
PSP	Pierced Steel Planking
PST	Pacific Standard Time
PTO	Part Time Operation
PVT	Private Operator
QDM	Magnetic bearing to facility
QDR	Magnetic bearing from facility
QFE	Height above airport elevation (or runway threshold elevation) based on local station pressure
QNE	Altimeter setting 29.92" Hg or 1013.2 Mb.
QNH	Altitude above sea level based on local station pressure
R	R-063 or 063R Magnetic Course (radial) measured as 063 from a VOR station. Flight can be inbound or outbound on this line.
RA	Radio Altimeter
RAI	Runway Alignment Indicator
RAIL	Runway Alignment Indicator Lights

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ABBREVIATIONS USED IN AIRWAY MANUAL

RAIM	Receiver Autonomous Integrity Monitoring
RAPCON	Radar Approach Control
RASS	Remote Altimeter Source
RCAG	Remote Communications Air Ground
RCC	Rescue Coordination Center
RCL	Runway Centerline
RCLM	Runway Center Line Markings
RCO	Remote Communications Outlet
REF	Reference
REIL	Runway End Identifier Lights
REP	Reporting Point
RESA	Runway End Safety Area
REV	Reverse
REP	Ramp Entrance Point
RF	Radius to Fix
RL	Runway (edge) Lights
RNAV	Area Navigation
RNP	Required Navigation Performance
RNPC	Required Navigation Performance Capability
ROC	Rate of Climb
RON	Remain Overnight
RPT	Regular Public Transport
RSA	Runway Safety Area
RTE	Route
RTF	Radiotelephony
RTS	Return to Service
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
RVV	Runway Visibility Values
RW	Runway
RWY	Runway
S	South or Southern
SAAAR	Special Aircrew and Aircraft Authorization Required
SALS	Short Approach Light System
SALSF	Short Approach Light System with Sequenced Flashing Lights
SAP	Stabilized Approach
SAR	Search and Rescue
SATCOM	Satellite voice air-ground calling
SAWRS	Supplementary Aviation Weather Reporting Station
SBAS	Satellite-Based Augmentation System
SCA	Southern Control Area
SCOB	Scattered Clouds or Better
SDF	Simplified Directional Facility
SE	Southeast
SEC	Seconds
SELCAL	Selective Call System
SFC	Surface of the earth (either land or water)
SFL	Sequenced Flashing Lights
SFL-V	Sequenced Flashing Lights - Variable Light Intensity
SID	Standard Instrument Departure
SIWL	Single Isolated Wheel Load
SKD	Scheduled
SLP	Speed Limiting Point
SM	Statute Miles
SMA	Segment Minimum Altitude
SMGCS	Surface Movement Guidance and Control System
SMSA	Segment Minimum Safe Altitude
SOC	Start of Climb
SODALS	Simplified Omnidirectional Approach Lighting System
SPAR	French Light Precision Approach Radar
SRA	Special Rules Area
SRA	Surveillance Radar Approach
SRE	Surveillance Radar Element
SR-SS	Sunrise-Sunset
SSALF	Simplified Short Approach Light System with Sequenced Flashing Lights
SSALR	Simplified Short Approach Light System with Runway Alignment Indicator Lights
SSALS	Simplified Short Approach Light System
SSB	Single Sideband
SSR	Secondary Surveillance Radar (in U.S.A. ATCRBS)
STAR	Standard Terminal Arrival Route (USA)
	Standard Instrument Arrival (ICAO)
STD	Indication of an altimeter set to 29.92" Hg or 1013.2 Mb without temperature correction
Std	Standard
ST-IN	Straight-in
STOL	Short Take-off and Landing
SW	Single Wheel Landing Gear
SW	Southwest
SYS	System
°T	True (degrees)
T	Terrain clearance altitude (MOCA)
T	Transmits only (radio frequencies)
T-VASI	Tee Visual Approach Slope Indicator
TA	Transition Altitude
TAA	Terminal Arrival Area (FAA)
TAA	Terminal Area Altitude (ICAO)

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ABBREVIATIONS USED IN AIRWAY MANUAL

TACAN	Tactical Air Navigation (bearing and distance station)
TAS	True Air Speed
TCA	Terminal Control Area
TCAS	Traffic Alert and Collision Avoidance System
TCH	Threshold Crossing Height
TCTA	Transcontinental Control Area
TDWR	Terminal Doppler Weather Radar
TDZ	Touchdown Zone
TDZE	Touchdown Zone Elevation
TEMP	Temporary
TERPS	United States Standard for Terminal Instrument Procedure
THR	Threshold
TIBA	Traffic Information Broadcast by Aircraft
TL	Transition Level
TMA	Terminal Control Area
TML	Terminal
TMN	Terminates
TMZ	Transponder Mandatory Zone
TNA	Transition Area
TODA	Take-off Distance Available
TORA	Take-off Run Available
TP	Turning Point
TRACON	Terminal Radar Approach Control
TRANS	Transition(s)
TRANS ALT	Transition Altitude
TRANS LEVEL	Transition Level
TRCV	Tri-Color Visual Approach Slope Indicator
TSA	Temporary Segregated Area
TVOR	Terminal VOR
TWEB	Transcribed Weather Broadcast
TWIP	Terminal Weather Information for Pilots
TWR	Tower (Aerodrome Control)
TWY	Taxiway
U	Unspecified
U	UNICOM
UFN	Until Further Notice
UHF	Ultra High Frequency (300-3000 MHz)
UIR	Upper Flight Information Region
UNCT'L	Uncontrolled
UNICOM	Aeronautical Advisory Service
UNICOM (A)	Automated UNICOM
UNL	Unlimited
U/S	Unserviceable
USAF	US Air Force
USB	Upper Sideband
USN	US Navy
UTA	Upper Control Area
UTC	Coordinated Universal Time
VAR	Magnetic Variation
VASI	Visual Approach Slope Indicator
VDP	Visual Descent Point
VE	Visual Exempted
VFR	Visual Flight Rules
VGSI	Visual Glide Slope Indicator
VHA	Volcanic Hazard Area
VHF	Very High Frequency (30-300 MHz)
VIS	Visibility
VMC	Visual Meteorological Conditions
VNAP	Vertical Noise Abatement Procedures
VNAV	Vertical Navigation
VOLMET	Meteorological Information for Aircraft in Flight
VOR	VHF Omnidirectional Range
VORTAC	VOR and TACAN co-located
VOT	Radiated Test Signal VOR
VPA	Vertical Path Angle
VV	Vertical Visibility
V/V	Vertical Velocity or speed
WAAS	Wide Area Augmentation System
W	West or Western
W/O	Without
WP	Area Navigation (RNAV) Waypoint
WSP	Weather Systems Processor
WX	Weather
X	On Request
Z	Zulu Time
Z	Coordinated Universal Time (UTC)

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ENROUTE CHART LEGEND

GENERAL

Jeppesen Enroute Charts are compiled and constructed using the best available aeronautical and topographical reference charts. Most Jeppesen Enroute Charts use the Lambert Conformal Conic projection. The design is intended primarily for airway instrument navigation to be referenced to cockpit instruments.

Charts are identified by code letters for world areas covered by a series, by parenthetical letters for the altitude coverage, and by numbers for the individual chart. For example, P(H/L)2 is a chart of the Pacific series covering both high and low altitude operations and is number 2 of the series. E(HI)3 and E(LO) 10 are charts of the European series covering high and low altitude operations respectively.

To use the Low Altitude and High/Low Altitude Enroute Charts, use the small index map on the cover panel to locate the major city closest to your desired area. These names are the major locations shown within each chart panel and are indicated along the “zigdex” at the top of the chart. Open the chart to the panel desired and follow your flight progress by turning the folds like the pages of a book. It is seldom necessary to completely unfold the chart. Although the High Altitude Charts do not have this “zigdex” feature, they may be used in the same way.

When the folded chart is opened at one of the zigdex numbers, the exposed portion of the chart is subdivided into four sections by a vertical and a horizontal fold. Each of the sections is labeled at the margin as A, B, C, or D. A combination of the panel number and the lettered section in which it falls is used to simplify finding a location referenced in the Enroute Chart NOTAMS or in the communications tabulation. For example, p5C means you will find the referenced item on panel 5 in section C.

Unless otherwise indicated, all bearings and radials are magnetic; enroute distances are in nautical miles; vertical measurements of elevation are in feet above mean sea level; enroute altitudes are either in feet above mean sea level (based on QNH altimeter setting) or clearly expressed as flight levels (FL) (based on standard altimeter setting of 29.92 inches of Mercury or 1013.2 millibars or Hectopascals); and all times are Coordinated Universal Time (UTC) unless labeled local time (LT).

Enroute communications are shown on the charts or tabulated on the end folds where they may be referred to with a minimum of paper turning. Terminal communications are also provided in the tabulations except on charts designed solely for high altitude operations. The end panel tabulations refer to the location of the facility on an area chart (if one exists) by a 4-letter identifier, as well as to the location within a panel and section of the Enroute Chart.

Due to congestion of airspace information within large metropolitan areas, complete off airway information is not always shown on Enroute Charts. These areas are supplemented by Area Charts at larger chart scales with complete information. They should be used for all flights when arriving or departing an airport within an Area Chart.

On the Enroute Charts, the Area Charts are identified by a shaded symbol on the cover panel, and a shaded dashed line, with location name, and Airport identifier on the Enroute Chart.

Enroute and Area Charts are supplemented by Enroute Chart NOTAMS when significant changes occur between revision dates.

Chart revision dates are always on a Friday (chart completion and/or mailing dates). Following this date a short concise note explains the significant changes made.

Chart EFFECTIVE dates other than EFFECTIVE UPON RECEIPT are provided when significant changes have been charted which will become effective on the date indicated.

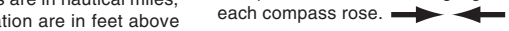
Chart symbols are portrayed on the following pages with an explanation of their use. Reference should be made to the Chart Glossary for a more complete explanation of terms. This legend covers all Enroute and Area Charts. Chart symbols on the following pages may not appear on each chart.

JEPPESEN IFR ENROUTE PLOTTER INSTRUCTIONS — ENROUTE AND AREA CHARTS

MILEAGES

Most Enroute and Area Chart mileages are represented on the plotter. Check the top margin of the chart in use for the correct scale. All chart scales, and all plotter scales, are in nautical miles.

BEARINGS AND COURSES

The plotter centerline is highlighted by arrows from each compass rose. 

Position the plotter centerline over the desired track to be flown. Slide the plotter left or right along the track until one of the compass roses is centered over the desired navaid.

If the centerline arrow on the compass rose points in the SAME direction as your flight, read the radial or bearing at the north tick extending from the navaid.

If the centerline arrow on the compass rose points OPPOSITE to the direction of flight, the radial or bearing is the reciprocal of the number read at the navaid’s north magnetic tick.

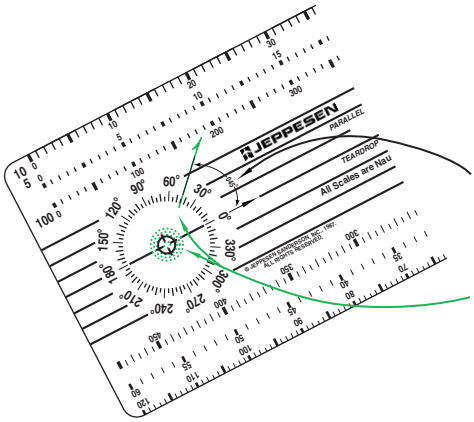
NOTE: If your earlier version plotter does not depict the arrows be sure the plotter is positioned so that the 360˚ position on the compass rose points in the SAME direction as your flight.

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ENROUTE CHART LEGEND

The compass rose is read in a counter-clockwise direction.

Example:



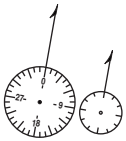
Correct 045 degree outbound ADF bearing is read in a counter-clockwise direction "backwards" from reading an HSI or Heading Indicator.

NDB, with Magnetic North tick, on the enroute or area chart.

ENROUTE CHART LEGEND

The following legend pages briefly explain symbology used on Enroute Charts worldwide. *Not all items apply in all areas.* Refer to Chart Glossary for more complete definitions of items.

NAVAID SYMBOLS



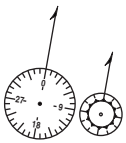
VOR (VHF Omnidirectional Range)



TACAN (Tactical Air Navigation) or DME (Distance Measuring Equipment)



Terminal class TACAN



VORTAC/VORDME



NDB (Nondirectional Radio Beacon)



Compass Locator (Charted only when providing an enroute function or TWEB); or a SABH class radio beacon.



Magnetic north ticks on navigational facilities fit compass roses on IFR Enroute Chart Plotters, making it possible to measure the magnetic bearing of any track.



LOC, LDA, or SDF Front Course



LOC Back Course



MLS Course

FAN MARKERS



Elliptical Pattern

Bone Pattern

Fan Marker and NDB

BROADCAST STATION



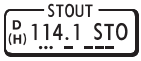
Commercial

Armed Forces Radio Station

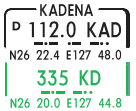
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ENROUTE CHART LEGEND

NAVAID IDENTIFICATION

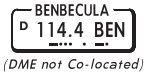


Navaid identification is given in shadow box when navaid is airway or route component, with frequency, identifier, and Morse Code. DME capability is indicated by a small "D" preceding the VOR frequency at frequency paired navaids. VOR and VORTAC navaid operational ranges are identified (when known) within the navaid box except on USA and Canada charts. (T) represents Terminal; (L) represents Low Altitude; and (H) represents High Altitude.



On High/Low altitude Enroute Charts, geographical coordinates (latitude and longitude) are shown for navaids forming high or all altitude airways and routes. On Area Charts, geographical coordinates are shown when navaid is airway or route component.

Some L/MF navaids are combined in the shadow box even though they are not part of the airway / route structure, except on US and CA charts. They are used for course guidance over lengthy route segments when airway/track is designated into a VOR.

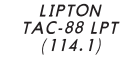


When VOR and TAC/DME antennas are not co-located, a notation "DME not Co-located" is shown below the navaid box.





Off-airway navaids are unboxed on Low and High/Low charts. TACAN/DME channel is shown when VOR navaid has a frequency paired DME capability. When an L/MF navaid performs an enroute function, the Morse Code of its identification letters are shown.

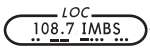




When TACAN or DME are not frequency paired with the VOR, the TACAN is identified separately. The "Ghost" VOR frequency, shown in parentheses, enables civilian tuning of DME facility.



The navaid frequency and identification are located below the location name of the airport when the navaid name, location name, and airport name are the same.



LOC, SDF, LDA and MLS navaids are identified by a round cornered box when they perform an enroute function. Frequency identification and Morse Code are provided. DME is included when navaid and DME are frequency paired.



Fan Marker name and code.

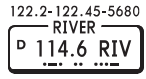


Dial-up Remote Communications Outlet (DRCO) (Canada). Connects pilot with an ATS unit via a commercial telephone line. See Canada Air Traffic Control pages for details.

COMMUNICATIONS

RADIO FREQUENCIES

Frequencies for radio communications are included above NAVAID names, when voice is available through the NAVAID. These frequencies are also shown at other remoted locations.



River Radio transmits on 114.6 and transmits and receives on 122.2, 122.45 MHz and HF frequency 5680.



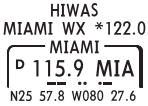
River Radio (RIV) guards (receives) on 122.1 and transmits through Canyon VOR on 113.9.



River Radio transmits and receives on 122.6 located at Diamond. Small circle enclosing dot denotes remote communication site.



Tapeats Radio transmits and receives on 122.2 and 122.4. Telephone symbol indicates additional frequencies in communications panel listed under Tapeats.



HIWAS — Hazardous Inflight Weather Advisory Service. Broadcasts SIGMETS, AIRMETS and PIREPS continuously over VOR frequency.



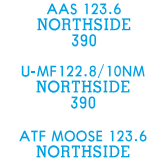
River Radio transmits and receives at Phantom on 122.3. Additionally, Phantom Radio transmits and receives on 122.6.



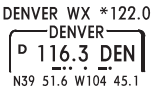
River Radio transmits through Lava VOR on 115.3, but is not capable of receiving transmissions through the VOR site.



Grand Radio is located at the airport and transmits and receives on 122.2 and 122.6. Additionally, Grand Radio provides LAA (Local Airport Advisory) on 123.6.



Terminal Radio frequencies and service may be included over airport or location name. Radio call is included when different than airport or location name. Mandatory Frequencies (MF), Aerodrome Traffic Frequencies (ATF) or UNICOM (U) frequencies include contact distance when other than the standard 5 nm.



US "Enroute Flight Advisory Service". Ident of controlling station to call, using (name of station) FLIGHT WATCH on 122.0 MHz. Charted above VORs associated with controlling station and remoted outlets. Service is not continuous.

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ENROUTE CHART LEGEND





The telephone symbol indicates additional communications may be found in the communications tabulation after the associated NAVAID or location name. Telephone symbol does not necessarily mean that voice is available through the NAVAID.



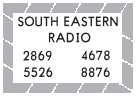
Call and frequencies of Control Service for use within graphically portrayed Radio Frequency Sector Boundaries.

Call sign "CONTROL" and / or "RADAR" is omitted in all communication boxes in several regions.

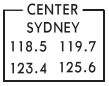


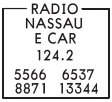
Plain language inflight weather station with name and frequency.





Call and frequencies of control or unit service. For use within geographical defined radio boundaries.



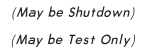


Call and frequency of enroute service or control unit. SINGLE SIDE BAND capabilities are available unless specified otherwise.

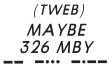


Remote air-to-ground antenna for direct communications with control center. Center is named in large type and name of remote site is in parentheses below followed by appropriate VHF frequencies.

NAVAID/COMMUNICATION DATA



Operational status at date of publication. Refer to Chart NOTAMS for current status, including substitute routes for VOR and VORTAC shutdowns.



(TWEB) indicates continuous automatic weather broadcast is provided on the facility frequency.



Class SABH radio beacons of limited navigation suitability indicate their primary purpose of continuous automatic weather broadcast by (WX).

(R)

Enroute Radar capability. (All domestic U.S. Centers are radar equipped so (R) is omitted from domestic U.S. Center boxes.)



Underline shown below navaid identifier indicates Beat Frequency Oscillator (BFO) required to hear Morse Code identifier.

*

Asterisk indicates navaid operation or service not continuous.

H + 04 & 15(1)

Marine beacon operation times. Transmission begins at 4 minutes past the hour and every 15 minutes thereafter in this illustration; other times will be indicated. Number in parentheses gives duration in minutes of transmission.

FOG:H + 02 & 08

Facility operates in fog only at times indicated.

RESTRICTED AIRSPACE

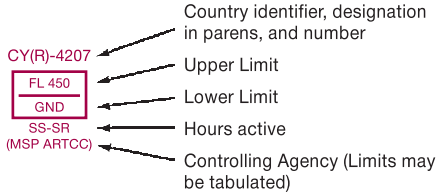
(Not shown on Eastern Hemisphere chart series when vertical limits are below 2000 feet AGL)



Restricted airspace. The accompanying label indicates it as prohibited, restricted, danger, etc.



Training, Alert, Caution, and Military Operations Areas.

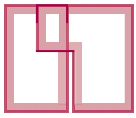




Dot indicates permanent activation on some chart series.



On USA charts K (indicating USA) and parens around the designating letter are omitted.



When restricted airspace areas overlap, a line is shown on the outer edge of each area through the area of overlap.

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ENROUTE CHART LEGEND

RESTRICTED AIRSPACE DESIGNATION

A-Alert	T-Training
C-Caution	W-Warning
D-Danger	TRA-Temporary Reserved Airspace
P-Prohibited	TSA - Temporary Segregated Area
R-Restricted	MOA-Military Operations Area

Canadian Alert Area Suffixes

(A) Acrobatic	(S) Soaring
(H) Hang Gliding	(T) Training
(P) Parachute Dropping	

AIRPORTS

Civil IFR	Civil VFR	Military IFR	Military VFR	
				Airports
				Seaplane Base
				Heliports

(LAA) LAA Local Airport Advisory

(AFIS) AFIS (Aerodrome Flight Information Service)

(ALA) Authorized Landing Area

DENVER COLO -Intl KDEN 5431-160 — Location name - IFR published procedure filed under this name with ICAO/Jeppesen NavData indicator. Airport elevation and longest runway length to nearest 100 feet with 70 feet as the dividing point (add 00).

Tidjikja GOND 1316-52s — Location name - VFR airport, no procedure published by Jeppesen. "s" indicates soft surface otherwise hard surface.

AIRWAY AND ROUTE COMPONENTS

AIRWAY AND ROUTES CENTER LINES

Airway/Route

Diversionary Route

Overlying High Altitude Airway/Route

OTR 12 — Oceanic Transition Route

RNAV Airway/Route

FIXES

Compulsory Reporting Point

Non-Compulsory Reporting Point

Low Altitude Compulsory Reporting Point

Low Altitude Non-Compulsory Reporting Point.

X — Mileage Break/Turning Point

RNAV Waypoint



Meteorological report required (unless instructed otherwise), giving air temperature, wind, icing, turbulence, clouds and other significant weather. Report to controlling ground station, or station indicated.



Holding Pattern. DME figures, when provided, give the DME distance of the fix as the first figure followed by the outbound limit as the second figure.



Length of holding pattern in minutes when other than standard.

(ABROC)

Database identifiers are enclosed in brackets [ABROC]. Database identifiers are officially designated by the controlling authority or they may be derived by Jeppesen. In either case, these identifiers have no ATC function and should not be used in filing flight plans nor should they be used when communicating with ATC. They are shown only to enable the pilot to maintain orientation when using charts in concert with database navigation systems.

LIMON V-8 7500 NW (MRA 7000)

Fix name with Minimum Crossing Altitude (MCA) showing airway, altitude, and direction, and Minimum Reception Altitude (MRA).

KULAFU (KLF)

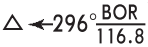
Official fix name (with country assigned identifier in parentheses). Several countries throughout the world assign identifiers for use in flight plans.



LF bearings forming a fix are to the navaid.



VHF radials forming a fix are from the navaid.



VHF frequency and identifier included when off chart or remoted.



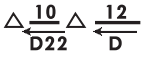
LF frequency, identifier and Morse Code included when off chart or remoted.



Arrow along airway points from the navaid designating the reporting point. Other published radials may be used if they are greater than 30 degrees from the airway being used and are not beyond the COP.

D55/MAZ

Fix formed by 55 DME from MAZ navaid.



"D" indicates DME fix and distance from the station that provides the DME mileage.

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ENROUTE CHART LEGEND

AIRWAY INFORMATION

V 168 — Airway and route designators. Negative (white letters in black) designators are used for distinction.

ATS — ATS-Designated route without published identifier

AWY 4 — AWY-Airway
B-Blue, Bravo

BR 7 — BR-Bahama Route, Canada Bravo Route

D — Direct Route
F-(suffix) Advisory service only

DOM — DOM-Domestic Route. Use by foreign operators requires special authorization.

G 78 — G-Green, Golf
G-(suffix) Flight Information only
GR-Gulf Route
H or HL-High Level
J-Jet
L-(suffix) L/MF airway

NAT — NAT-Route associated with the North Atlantic Organized Track structure.

OTR — OTR-Oceanic Transition Route
PDR-Predetermined Route

R 11 — R-Red, Romeo

J888R — R-(suffix) RNAV route
RR-Canada Romeo Route
SP-Supersonic RNAV route

UL 5 — U-Upper
UL-(prefix) RNAV route

V 121 — V-Victor
V-(suffix) VOR airway
W-White, Whiskey

A 5 / **UL 7123** / **L 7 1** — One Way Airway
Suffix 1 or 1, 2 or 1, 2, 3 gives the Conditional Route Category (Europe).

2500 / FL 40 — MEA (Minimum Enroute Altitude), shown as altitude or flight level.

MEA is established with a gap in nav-signal coverage.

6500 / 9900 — Directional MEAs as indicated.

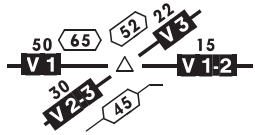
7500G — GPS MEA

1300T — MOCA (Minimum Obstruction Clearance Altitude).

1300a — Route MORA (Route Minimum Off-Route Altitude). See glossary.

MAA 25000 / **MAA FL 240** — MAA (Maximum Authorized Altitude), shown as altitude or flight level.

MEA change, limit of MAA applicability or MAA change. Also MOCA or MORA change when MOCA or MORA is charted with no MEA. Symbol is omitted at navaid.



Mileages. Total mileage between navaids is positioned along respective airway centerline. Total mileage may have directional pointers when there are multiple airway designators. The pointers parallel the airway centerlines along which the mileage applies.

137° — VOR radial & route bearings (magnetic)

137°T — VOR Radial and route bearings (true)

ADF Bearings (inbound or outbound). Bearings are magnetic unless followed by a "T" indicating True.

279° / **279°T** — ADF Bearings include an arrow to indicate the direction of flight or, when used to designate Fixes, direction to the station. In remote or oceanic areas where ground based navigation aids are not available, the arrow indicates the direction of flight.

266°T / **086°T** — ADF bearings (True at track midpoint).

21 / 32 — The navigation frequency COP (changeover point) between two stations is indicated by mileages from the station to the point of change. Omitted when at midpoint or turning point.

E> — Means even thousands altitudes/flight levels are used in the direction of the arrow and odd thousands in the opposite direction. For application of this symbol above FL 290, the left half of the cruising level rose is considered even. The symbol is shown where altitude/flight level assignment is opposite that shown in the standard cruising altitude/flight level rose.

E&O> — Means all altitudes, even and odd, are available in the direction indicated.

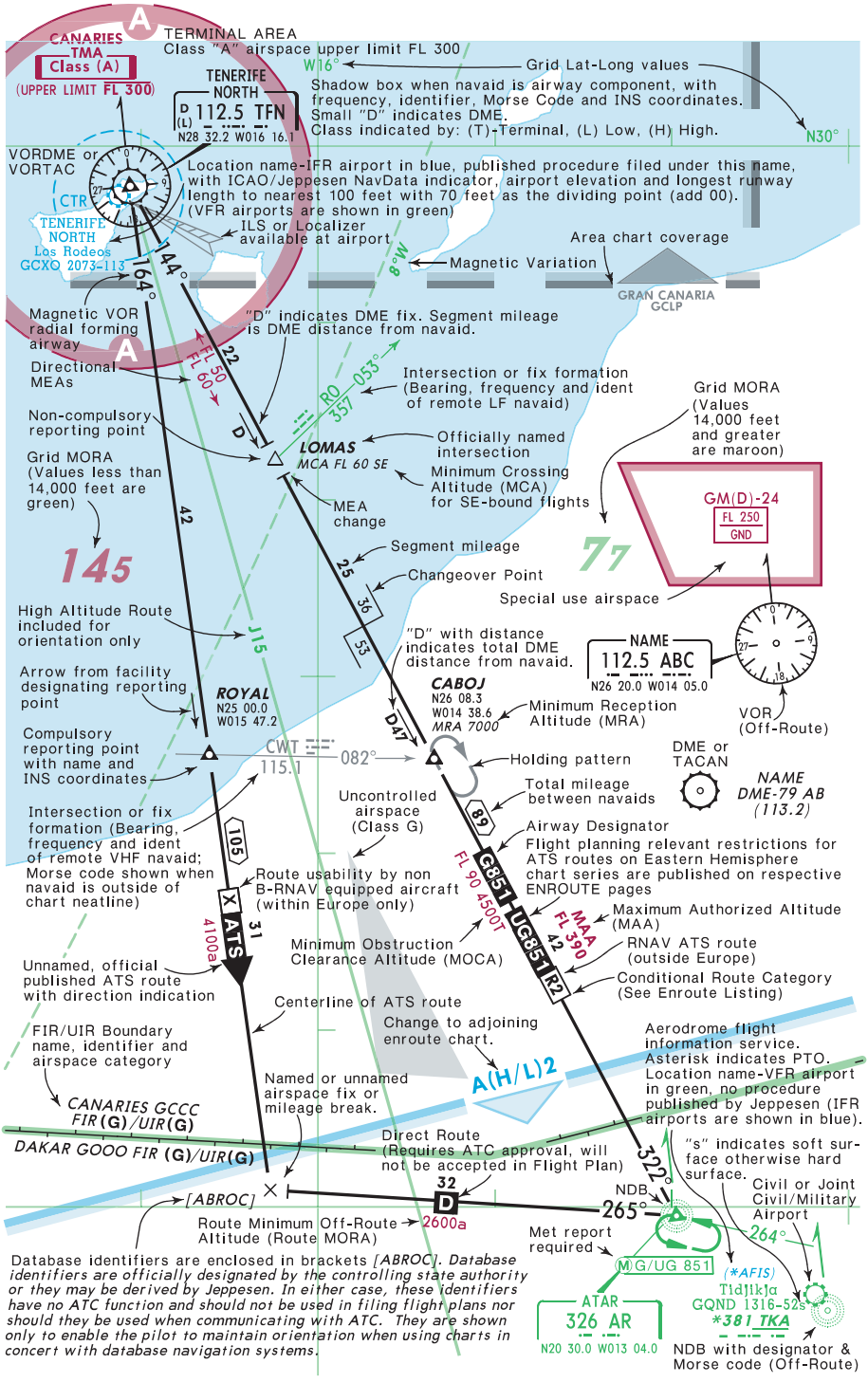
O> — Means odd thousands altitude/flight level per the above definition. "O" is used only on one way airways to show that odd altitude/flight level assignments apply.

PPR➤ — Prior Permission Required from ATC for flight in the direction of the arrow.

FPR➤ — Flight Planned Route describes any route or portion thereof that is identical to that filed in the flight notification and sufficient routing details are given to definitely establish the aircraft on its route.

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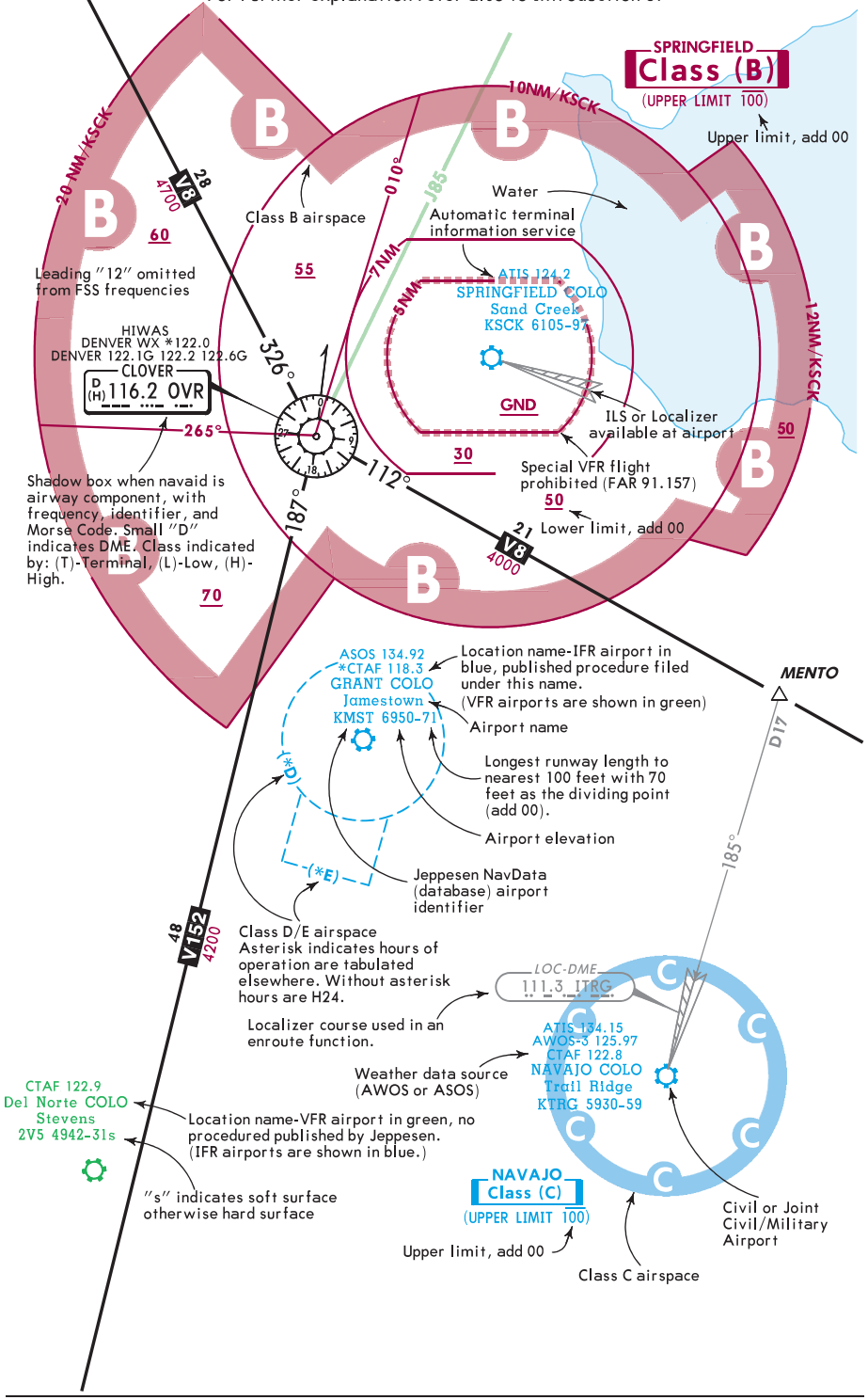
ENROUTE CHART LEGEND
LOW & HIGH/LOW ALTITUDE CHART LEGEND



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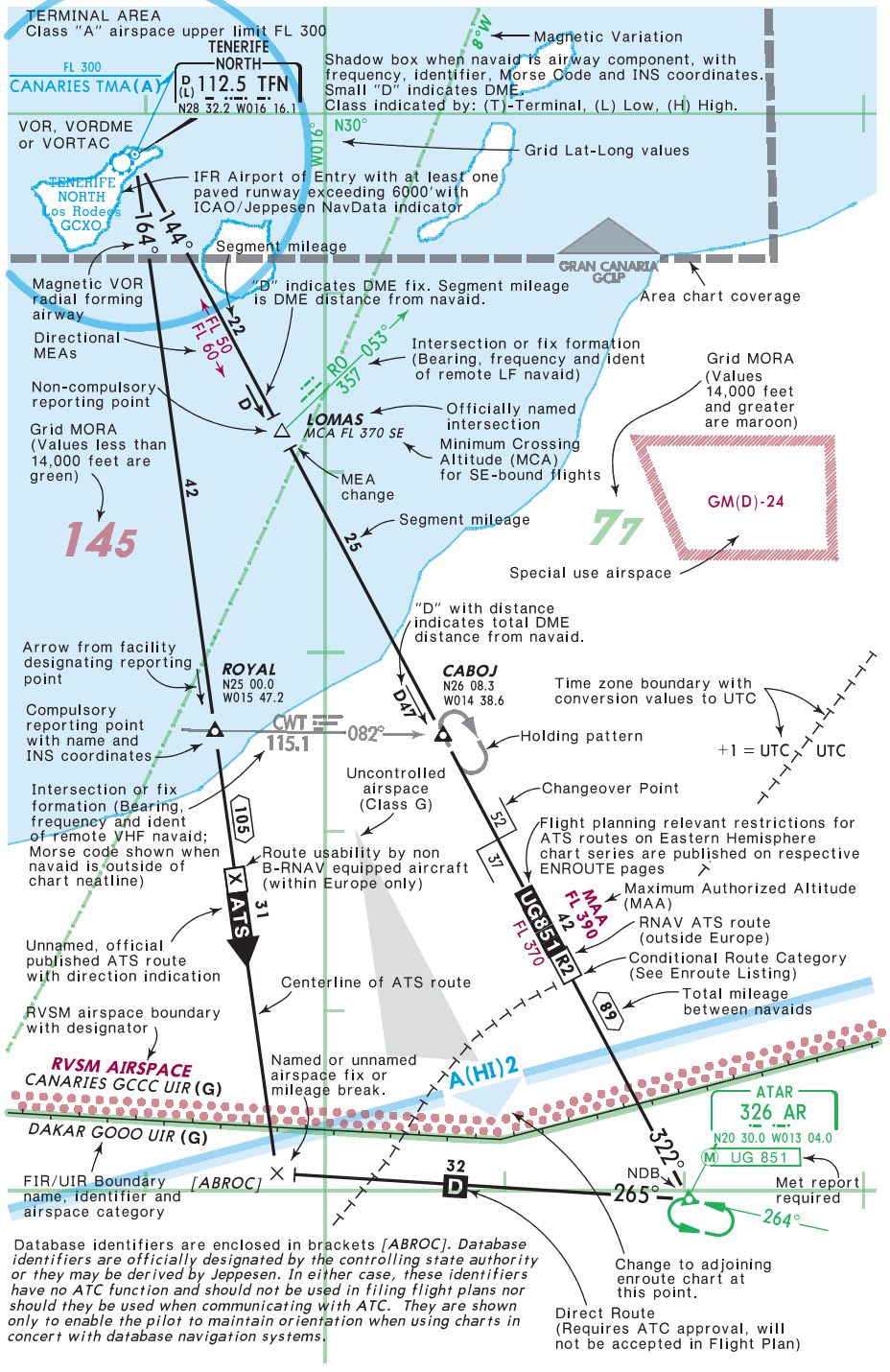
UNITED STATES LOW ALTITUDE ENROUTE & AREA CHART LEGEND

For Further explanation refer also to Introduction 57



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ENROUTE CHART LEGEND
HIGH ALTITUDE ENROUTE CHART LEGEND

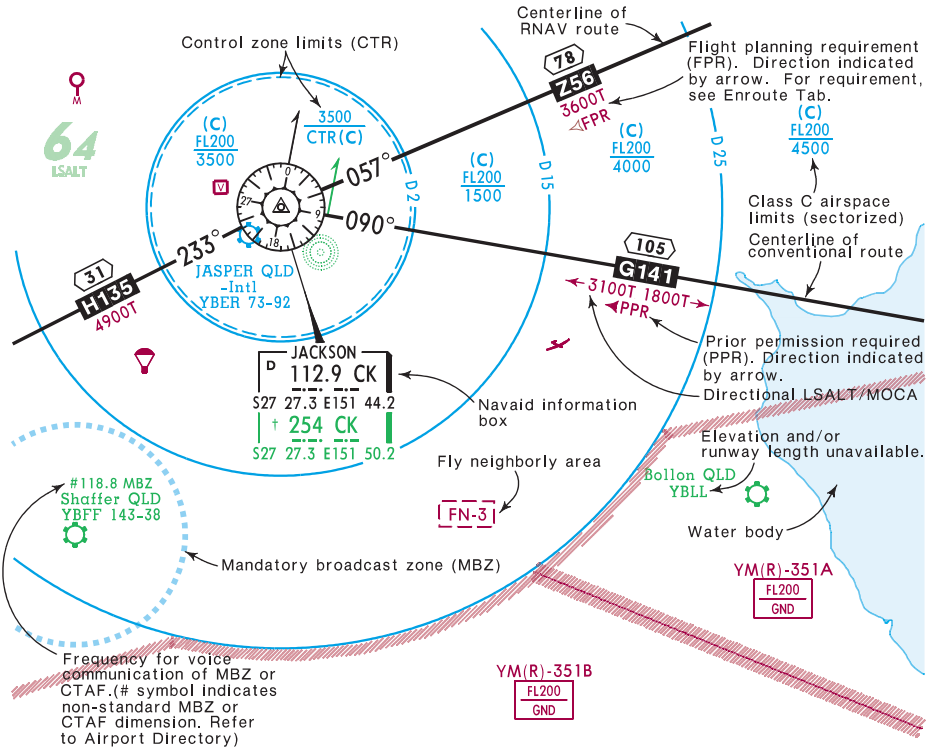


Database identifiers are enclosed in brackets *[ABROC]*. *Database identifiers are officially designated by the controlling state authority or they may be derived by Jeppesen. In either case, these identifiers have no ATC function and should not be used in filing flight plans nor should they be used when communicating with ATC. They are shown only to enable the pilot to maintain orientation when using charts in concert with database navigation systems.*

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ENROUTE CHART LEGEND
AUSTRALIA ENROUTE & AREA CHART LEGEND

The symbology explained on these pages pertain specifically to Australia Enroute and Area charts.



SPECIAL ACTIVITY AREAS

- Ultra-light activity above 500′ AGL.
- Hang glider activity above 5000′ AGL.
- Model aircraft activity above 300′ AGL.
- Meteorology balloon ascents.
- Manned balloon ascents.
- Parachute jumping area.
- Glider Operations.
- Gliders Launching.
- Airport within VHF range of responsible ATS unit.
- # Non-standard CTAF and MBZ, see airport directory for dimensions.
- † † Navaid limitation, see Radio Aids page AU-37 (applicable only for Australia domestic services).

REPORTING POINTS (AUSTRALIA)

COMPULSORY for all aircraft.

All altitude
Low altitude

ON-REQUEST 300 KT TAS or more.
COMPULSORY Under 300 KT TAS.

All altitude
Low altitude

AIR TRAFFIC SERVICE UNITS & BOUNDARIES

Class G Uncontrolled Airspace

FIS BRISBANE CENTER (SPRINGBROOK) 130.4

PERTH RADIO 118.1 INO-1 3476 5634 17061

FIS BRISBANE CENTER (MT HEATON) 124.8

Class E Controlled Airspace

ROUTE DESIGNATORS

Conventional Routes:

A,B,G,R: Regional
H (one-way), J (two-way): Domestic
V (one-way), W (two-way): Predominantly low-level domestic

RNAV Routes:

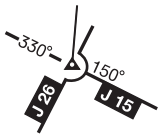
L,M,N: Regional (Tasman)
Q: 180°-359° domestic
Y: 360°-179° domestic
T: Two-way domestic
Z: Two-way low-level domestic

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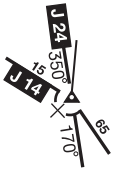
ENROUTE CHART LEGEND

AIRWAY NAVAID/REPORTING POINT BY-PASS

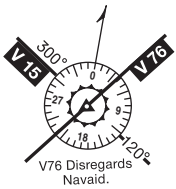
When an airway passes over or turns at a navaid or reporting point, but the navaid is not to be utilized for course guidance and/or no report is required, the airway centerline passes around the symbol. In cases where a by-pass symbol cannot be used, an explanatory note is included.



Airway J26 does not utilize the navaid or reporting point.



Airway J14 turns at the navaid or reporting point but does not utilize them. A mileage break "X" is included to further indicate a turn point.



Airway V76 does not utilize the navaid. A note indicating the proper use of the navaid is included.



Airway V76 does not utilize the Int. A note indicating the proper use of the Int is included.

BOUNDARIES

ADIZ, DEWIZ and CADIZ

FIR, UIR, ARTCC or OCA boundary.

International boundary.

Time zone boundary.

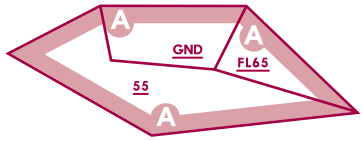
QNH/QNE-boundaries.

RVSM boundary

ICAO AIRSPACE CLASSIFICATIONS

Airspace classification is designated by the letters **(A)** thru **(G).** Classification **(A)** represents the highest level of control and **(G)** represents uncontrolled airspace. The definition of each classification is found in the Glossary portion of this section and the Enroute and Air Traffic Control section of this manual. The airspace classification letter is displayed in association with the airspace type and vertical limits.

AIRSPACE CLASS "A"



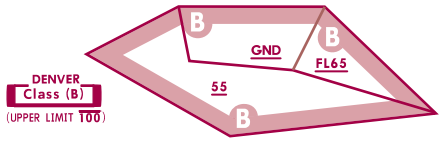


Lower limits may be used if it results in a clearer presentation (i.e. "stacked" airspace.

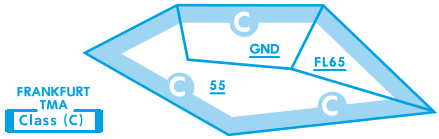


Upper limits omitted if at or above plane of division on a low chart.

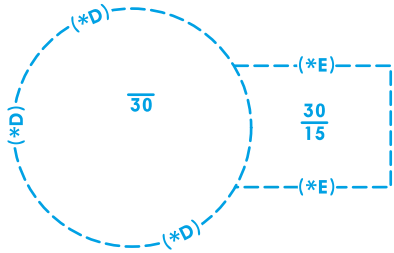
AIRSPACE CLASS "B"



AIRSPACE CLASS "C"



AIRSPACE CLASS "D & E"



Asterisk indicates hours of operation are not continuous. In such cases, operational hours will be tabulated elsewhere. Without asterisk hours are H24.

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ENROUTE CHART LEGEND

Controlled airspace shown in white.
Uncontrolled airspace shown as a tint.

Controlled airway/route.

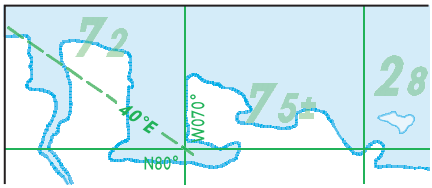
Uncontrolled airway or advisory route.

Radio Frequency Sector Boundary.

Radio boundaries of control or service unit.

Boundaries within TMAs or CTAs defining different altitude limits and/or sectorizations.

ORIENTATION



Grid shown at the intersection of units of latitude and longitude or by complete line.

Magnetic variation isogonic lines are indicated at the edge of the chart or are extended fully across the chart in a continuous dashed line.

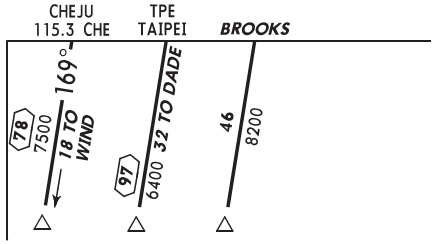
Shorelines and large inland lakes are shown.

Grid Minimum Off-Route Altitude (Grid MORA) in hundreds of feet provides reference point clearance within the section outlined by latitude and longitude lines. Grid MORA values followed by a +/- denote doubtful accuracy, but are believed to provide sufficient reference point clearance.

BORDER INFORMATION



This area overlapped by charts indicated.



To Notes: Name outside the neatline is the next airway navaid to which the total mileage is given. Navaid identification is shown on all charts series. Reporting point name is shown when it is the airway termination.

To Notes: Name inside the neatline is the first reporting point outside the chart coverage to which the mileage and MEA are shown.

Airway lead information: The frequency and identifier of an off-chart navaid are shown when the navaid designates an on-chart reporting point, changeover point or course change.

MISCELLANEOUS

Outline indicates coverage of a separate Area Chart. Information within this outline for terminal operation may be skeletonized. The Area Chart should be referred to if departure or destination airport is within this boundary to ensure pertinent information is available.



On Enroute Chart coverage diagrams, shaded symbol denotes Area Chart coverage. Area Chart name is included with shaded symbol.

Outline indicates an area covered elsewhere on the same or adjoining chart in enlarged scale. Information within this outline may be skeletonized.

Ball Flags: Number or letter symbol used to index information not shown at the point of applicability, but carried in a like-identified note within the same panel, or in one place on a separate panel.

1

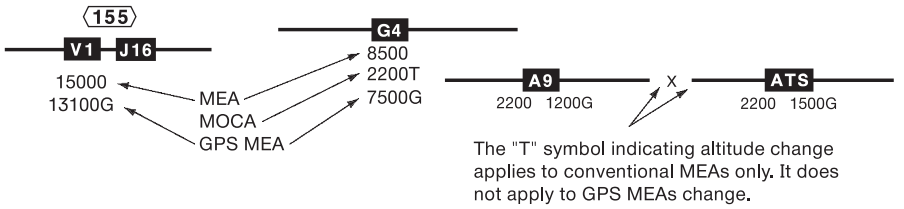
Reference number for INS Coordinates. These coordinates are tabulated elsewhere on the chart and identified in a like manner.

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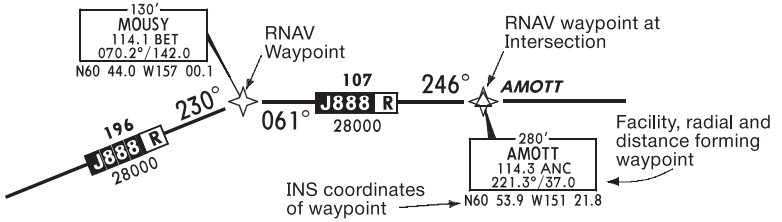
ENROUTE CHART LEGEND

U.S. GPS MEAs

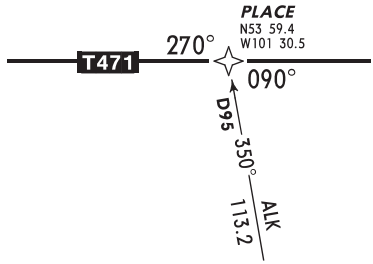
GPS MEAs are supplemental to and lower than the regular MEA. GPS MEAs are not established for every route, or for every route segment. The absence of a GPS MEA means one has not been provided and the regular route MEA applies. A GPS MEA may be higher than, equivalent to, but not lower than a Minimum Obstruction Clearance Altitude (MOCA) associated with a given route segment.



U.S. SERIES 800 AND 900 DESIGNATED RNAV ROUTES

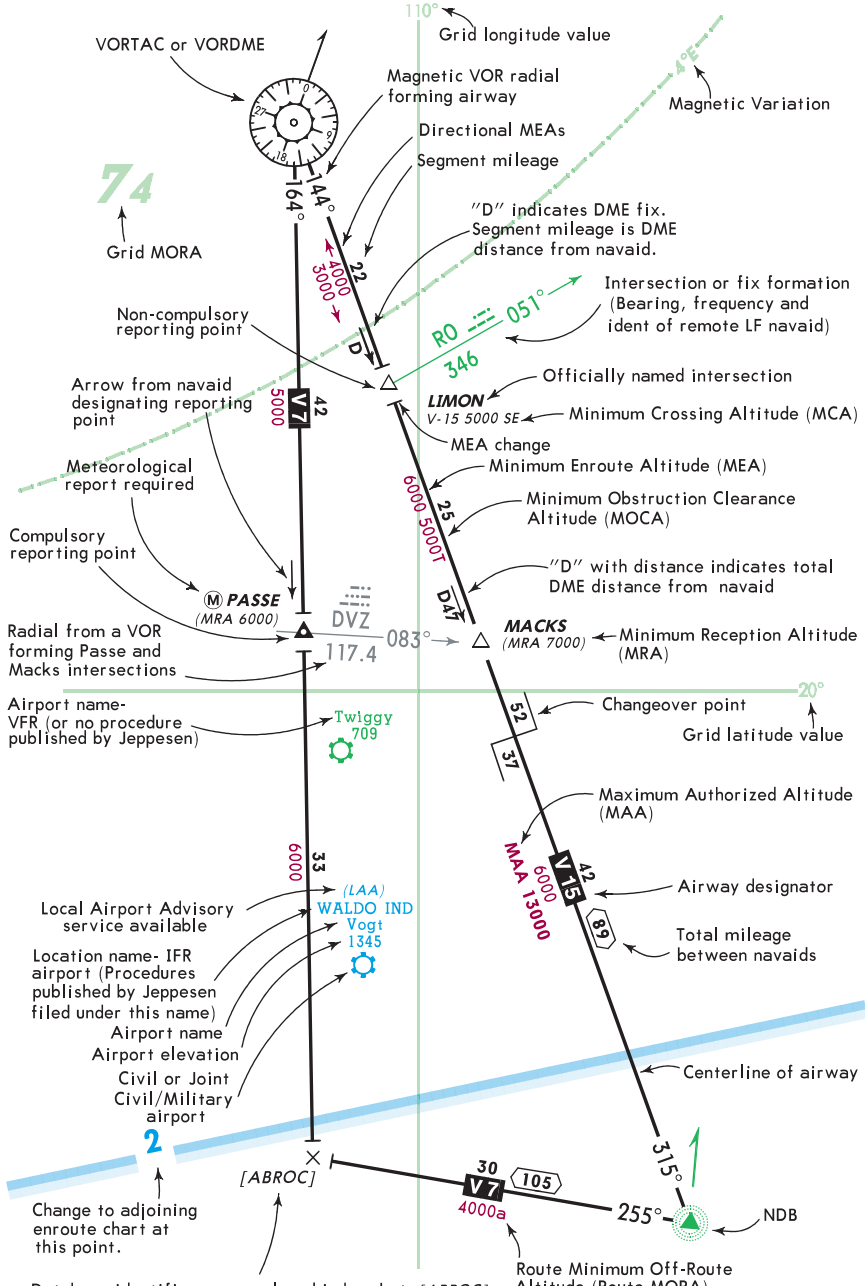


AUSTRALIA AND CANADA T RNAV ROUTES



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ENROUTE CHART LEGEND



Database identifiers are enclosed in brackets *[ABROC]*

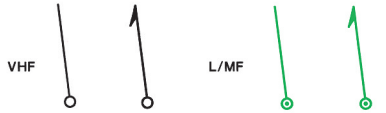
Database identifiers are officially designated by the controlling state authority or they may be derived by Jeppesen. In either case, these identifiers have no ATC function and should not be used in filing flight plans nor should they be used when communicating with ATC. They are shown only to enable the pilot to maintain orientation when using charts in conjunction with database navigation systems.

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ENROUTE CHART LEGEND
HIGH ALTITUDE CHARTS

The following legend, applicable to High Altitude Charts only, is in addition to the preceding legend. Many items in the preceding legend are also applicable to the High Altitude Charts.

VHF, L/MF Navigational Facilities.



Geographical coordinates (latitude and longitude) of each facility are shown across the bottom of the facility box. The letter (H) indicates an H-class facility. The letter (L) indicates an L-class facility. The letter (T) indicates a T-class facility. The letter "D" indicates the availability of DME. In areas of congestion, off-route facility geographical coordinates are shown in an alphabetical listing elsewhere on the chart.





MIAMI Center (R)
119.82 124.7 125.07 126.52
128.22 128.65 132.2 133.9
134.8 135.07 135.2
***Flt Watch 132.72**

US High Altitude Air Route Traffic Control Center communications frequencies in Communications Tabulations on chart end panel. "Flight Watch" (Enroute Flight Advisory Service) at the end of the frequency array. Service is provided between 0600 and 2200 daily.



(1500-0300 UTC)

One-way preferred route 24 hours unless hours are indicated. Two-way during other hours.

25000
FL 250

MEA (Minimum Enroute Altitude) shown only when higher than floor of the high altitude structure.

AREA CHARTS

The following legend, applicable to Area Charts only, is in addition to the preceding legends. Many items in the preceding legends are also applicable to the Area Charts.



Departure route.



Arrival route.

Arrival & Departure on same route.



Speed Limit Point-Speed restriction on shaded side of symbol.



Airport diagram showing runways of major airports only.



Other airports are shown by green symbols.



Man-made structure having a height of 1000 feet or more above ground level. The elevation is above mean sea level.

Communications frequencies for the major airports shown on an Area Chart are given in a block as illustrated below.

COMMUNICATIONS
SEATTLE, WASH
Seattle-Tacoma Intl. **App/Dep** (076°-160° Rwy 16, 341°-075° 119.2) (199°-300° 120.1) (301°-340° Rwy 34 120.4) (076°-160° Rwy 34, 301°-340° Rwy 16 125.9) (161°-198° 126.5). **Twr** 119.9. **Gnd** 121.7.
Boeing Field/King Co Intl. **Seattle App(R)/Dep(R)** (076°-160° Rwy 13, 341°-075° 119.2) (199°-300° 120.1) (301°-340° Rwy 31 120.4) (076°-160° Rwy 31, 301°-340° Rwy 13 125.9) (161°-198° 126.5). **Boeing *Twr** (128°-308° 120.6) (309°-127° 118.3). **Gnd** 121.9

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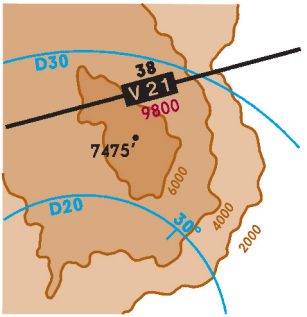
ENROUTE CHART LEGEND
AREA CHRTS (Continued)

GENERALIZED TERRAIN CONTOURS

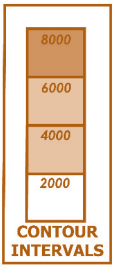
Terrain information may be depicted on area charts when terrain within the area chart coverage rises more than 4000 feet above the main airport.

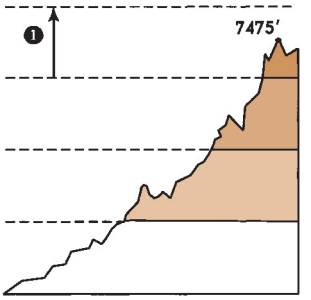
Generalized terrain contour lines and contour values are depicted on selected charts. Gradient tints indicate the elevation change between contour intervals. Contour lines, values and tints are printed in brown. Within contour intervals some, but not all, terrain high points may be included along with their elevation above mean sea level for use as additional reference.

THE TERRAIN CONTOUR INFORMATION DEPICTED DOES NOT ASSURE CLEARANCE ABOVE OR AROUND TERRAIN OR MAN-MADE STRUCTURES. THERE MAY BE HIGHER UNCHARTED TERRAIN OR MAN-MADE STRUCTURES WITHIN THE SAME VICINITY. TERRAIN CONTOUR INFORMATION IS USEFUL FOR ORIENTATION AND GENERAL VISUALIZATION OF TERRAIN. IT DOES NOT REPLACE THE MINIMUM ALTITUDES DICTATED BY THE AIRWAY AND AIR ROUTE STRUCTURE. *Furthermore, the absence of terrain contour information does not ensure the absence of terrian or structures.*



DME arcs are included for situational awareness.





❶ Within each contour interval, terrian may exist up to but not exceeding the level (elevation) of the *next higher contour interval.*

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CLASS B AIRSPACE CHART LEGEND

The following is applicable to Class B Airspace Charts. Refer to chart glossary for more complete details.

These charts depict the horizontal and vertical limits of Class B airspace established by the United States Federal Aviation Administration and provide orientation details for flights operating within the area. Class B airspace VFR Communications are included.

For Operating Rules and Pilot Equipment Requirements see FAR 91.131, 91.117 and 91.215. The Class B airspace Charts include only general IFR and VFR Flight Procedures appropriate to their particular area.

Index number allows the chart to be filed immediately behind the associated Area Chart (if such a chart exists).

10-1A

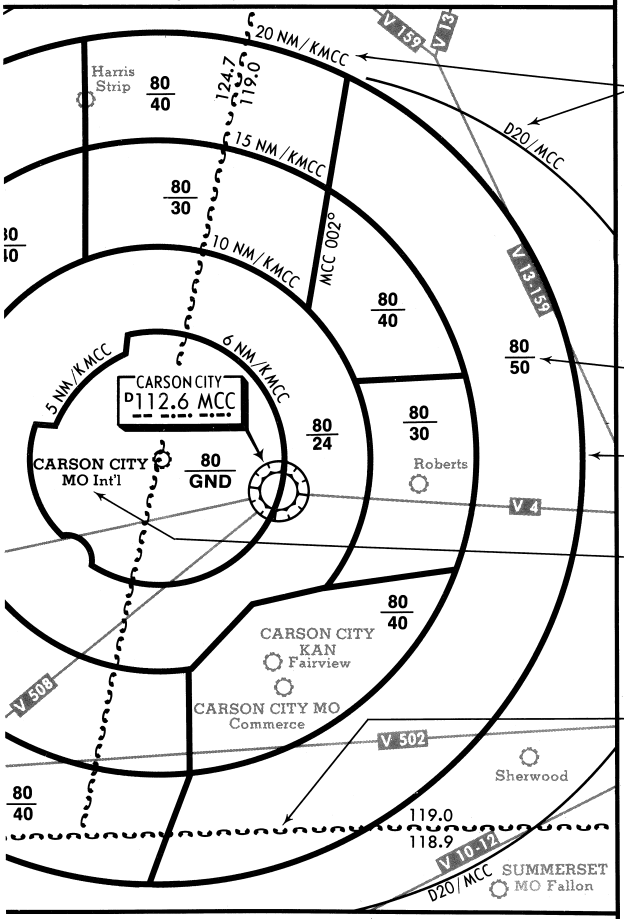
CLASS (B)

CARSON CITY, MO

CLASS B AIRSPACE

AIRSPACE VFR COMMUNICATIONS
City App 124.7 E of Rwy 1/19 **Carson City App** 119.0
Hoover, Kan and Big Valley, Mo Apts **Carson City App** 118.9

Communication sector frequency assignments.



DME arc distances and airway structure provided for orientation.

Vertical limits of Class B airspace within charted sector.

Bold lines represent the horizontal limits of Class B airspace and Class B airspace sectors.

Primary airport/s is shown in bold print.

Communication sector boundary.

ULES AND PILOT AND EQUIPMENT REQUIREMENTS
91.215

FLIGHT PROCEDURES

Additional information or instructions.

Class B airspace are required to operate in accordance with current

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SID/DP AND STAR LEGEND

The following legend is applicable to Standard Instrument Departure (SID), Departure (DP), Standard Terminal Arrival (STAR) and Arrival Charts. Refer to the Chart Glossary for more complete definition of terms.

These charts are graphic illustrations of the procedures prescribed by the governing authority. A text description may be provided, in addition to the graphic, when it is furnished by the governing authority. *Not all items apply in all areas.*

All charts meet FAA requirements for aeronautical charts. All altitudes shown on SID/DP and STAR charts are MSL, unless otherwise specified.

COMMUNICATIONS AND ALTIMETER SETTING DATA

Departure Control frequencies are included with SIDs/DPs. The frequencies are listed in the heading of the chart or when frequency sectors are specified they may be displayed in the planview of the chart.

HEADING: TERPS Departure (R) **126.9**

PLANVIEW: sector boundary symbol → EAST SECTOR TERPS DEPARTURE CONTROL 126.9

The ATIS frequency is provided on STARs in the heading of the chart.

ATIS **120.3**

The Transition Level and Transition Altitude are listed below the Communications. For a complete explanation of Transition Level and Transition Altitude see Introduction page 103.

TRANS LEVEL: FL 140
TRANS ALT: 13000'

CHART IDENTIFICATION

STARS

(10-2) (10-2A), etc. Index number

(10-2) (10-3) Special chart issued to special coverages only. Contains modified information for your company.

STAR Standard Terminal Arrival

ARRIVAL Arrival Procedure

SIDS/DPs

(10-3) (10-3A), etc. Index number

SID Standard Instrument Departure

DP DEPARTURE Departure Procedure

ROUTE IDENTIFICATION

TYPICAL EXAMPLES USING COMPUTER LANGUAGE

STARS

MOORPARK FOUR ARRIVAL (FIM.MOOR4)
Arrival Name — Arrival Code

FRESNO (FAT.MOOR4)
Transition Name — Transition Code

SID/DP

MILIS (ROCKI1.MILIS)
Transition Name — Transition Code

PILOT NAV SID/DP

Departure Name

ROCKI ONE DEPARTURE (ROCKI1.ROCKI) (PILOT NAV)

Departure Code

Primary Navigation is by pilot, not radar

VECTOR SID/DP

DENVER FIVE DEPARTURE (DEN5.DEN) (VECTOR)

SID/DP where ATC provides radar navigational guidance to an assigned route or to a fix depicted on the SID/DP. Vector SIDS/DPs indicate the fix or route to which the pilot will be vectored.

TYPICAL EXAMPLES NOT USING COMPUTER LANGUAGE

STARS

ALPHA ARRIVAL (RWY 10)
Arrival Name — Specified runway to be used

RUNWAY 13 ARRIVAL

SID/DP

INDIA DEPARTURE
Departure Name

RUNWAY 13 DEPARTURE

Database identifier are included when different than the name or computer code. The database identifier is enclosed in brackets.

POGO NORTH 7X DEPARTURE
[POGN7X]

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SID/DP AND STAR LEGEND
GRAPHIC
(Charts are not drawn at a specific scale)

RADIO SYMBOLS

VORTAC/VORDME

VOR (VHF Omnidirectional Range)

TACAN (Tactical Air Navigation) or DME (Distance Measuring Equipment)

NDB (Nondirectional Radio Beacon)

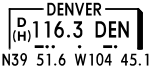
LOC, LDA, or SDF Front Course

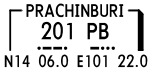
LOC Back Course

Locator with Outer Marker (LOM)

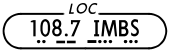
Outer or Middle Marker (OM) (MM)

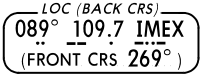
RADIO IDENTIFICATION





Navaid identification is given in shadow box with frequency, identifier, Morse Code and latitude & longitude coordinates. DME capability is indicated by a small "D" preceding the VOR frequency at frequency paired navaids. VOR and VORTAC facility operational ranges are identified (when known) within the navaid box. (T) represents Terminal; (L) represents Low Altitude; and (H) represents High Altitude.





Localizer navaids are identified by a round cornered box. Frequency identification and Morse Code are provided. DME is included when navaid and DME are frequency paired. Localizer back course facility boxes include front course bearing for HSI setting.

AIRSPACE FIXES

△ ✧ × - Non-Compulsory Airspace fixes.

▲ ✦ - Compulsory Airspace fixes.

△ ▲ ✦ ✧ × - Fly-over Airspace fixes.

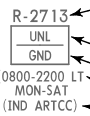
VERTICAL NOISE ABATEMENT PROCEDURES

RWY	VNAP
07, 15	A
25, 33	A or B

Vertical Noise Abatement Procedures (VNAP). For explanation of procedures, see Air Traffic Control section.

RESTRICTED AIRSPACE

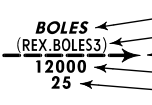
PROHIBITED, RESTRICTED, DANGER AREAS
Prohibited, Restricted & Danger Areas are charted when referenced in SID/DP or STAR source, plus any Prohibited Area within five (5) nautical miles of route centerline or primary airport.



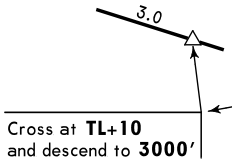
Designation (Type of area can be determined by P-Prohibited, R-Restricted, D-Danger.)
Upper Limit
Lower Limit
Hours active
Controlling Agency

ROUTE PORTRAYAL

SID/DP and STAR Track



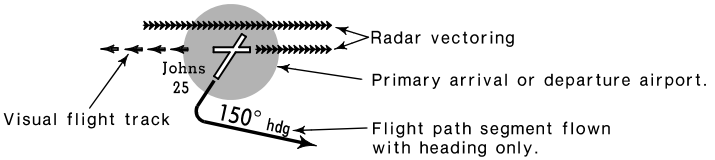
Transition name
Route identification code
Transition track
Minimum Enroute Altitude (MEA)
Segment mileage



Crossing altitude instructions, Transition Level plus 1000'

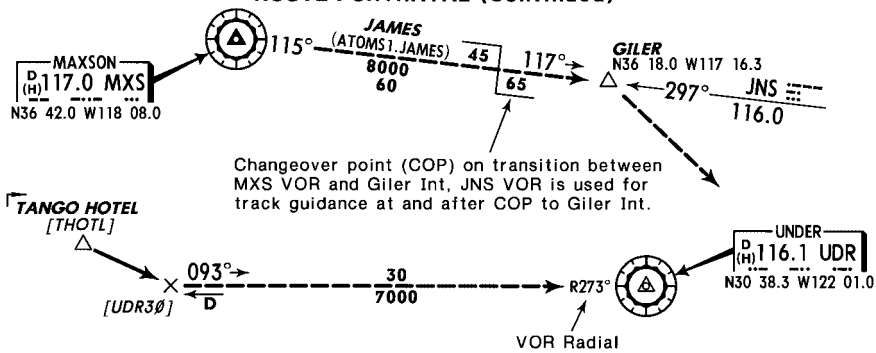


SID/DP or STAR label of a particular route in some coverage areas

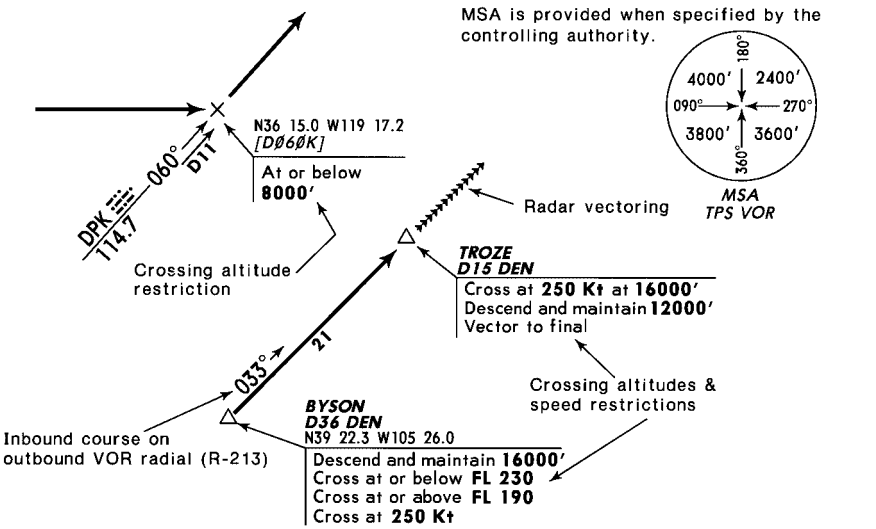


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SID, DP, AND STAR LEGEND
GRAPHIC (Continued)
ROUTE PORTRAYAL (Continued)



Database identifiers are enclosed in brackets *[UDR3Ø]. Database identifiers* are officially designated by the controlling state authority or are derived by *Jeppesen.* In either case, these identifiers have no ATC function and are not to be used in filling flight plans nor are they to be used when communicating with ATC. *Database identifiers are shown only to enable the pilot to maintain orientation when using charts in concert with database navigation systems.*



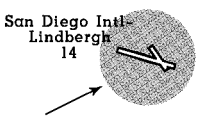
SID/DP CLIMB GRADIENT/CLIMB RATE TABLE

This SID/DP requires a minimum climb gradient of 330′ per NM to 9000′.
Climb gradient converted to climb rate in feet per minute at specified ground speeds.

Required climb gradient

Gnd speed-Kts	75	100	150	200	250	300
330′ per NM	413	550	825	1100	1375	1650

Climb gradient



Arrival/departure airport, highlighted with circular screen.

"MILITARY" notation indicates military source used for this procedure.

MILITARY

LOST COMMUNICATIONS PROCEDURE ONLY
If not in contact with Departure Control one minute after take-off:
Rwy 1: Climb straight ahead to 4000′, climbing right turn, thence intercept and proceed via GER R-039 to Mikes Int, then via (transition) or (assigned route).

Symbol identifies the LOST COMMUNICATIONS PROCEDURE to be flown when communications are lost with ATC after take-off.

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SID, DP AND STAR LEGEND

PROCEDURE APPLICABLE TO USA FAA ONLY

Instrument Departure Proceduures (DPs)

Pilots of civil aircraft operating from locations where DPs are effective may expect ATC clearances containing a DP. Use of a DP requires pilot possession of at least the textual description of the approved effective DP. Controllers may omit the departure control frequency if a DP clearance is issued and the departure control frequency is published on the DP. ATC must be immediately advised if the pilot does not possess a charted DP or a preprinted DP description or, for any other reason, does not wish to use a DP. Notification may be accomplished by filing "NO DP" in the remarks sections of the filed flight plan or by the less desirable method of verbally advising ATC.
DPs will be depicted in one of two basic forms.

Pilot navigation (Pilot NAV)

DPs are established where the pilot is primarily responsible for navigation on the DP route. They are established for airports when terrain and safety related factors indicate the necessity for a pilot NAV DP. Some pilot NAV DPs may contain vector instructions which pilots are expected to comply with until instructions are received to resume normal navigation on the filed/assigned route or DP.

Vector DPs

Are established where ATC will provide radar navigational guidance to a filed/assigned route or to a fix depicted on the DP.

Obstruction Clearance During Departure

DPs are either textual or graphically depicted. They may be established for obstacle avoidance or for ATC purposes. Simple DPs required for obstacle avoidance are usually textual. More complex DPs required for obstacle avoidance, all RNAV DPs, and DPs required for ATC purposes are graphically depicted. DPs assist pilots conducting IFR flight in avoiding obstacles during climbout to minimum enroute altitude (MEA). Obstacle clearance is based on the aircraft climbing at least 200 feet per nautical mile, crossing the end of the runway at least 35 feet AGL, and climbing to 400 feet above airport elevation before turning, unless otherwise specified in the procedure. A slope of 152 feet per nautical mile, starting no higher than 35 feet above the departure end of the runway, is assessed for obstacles. A minimum obstacle clearance of 48 feet per nautical mile is provided in the assumed climb gradient. If no obstacles penetrate the 152 feet per nautical mile slope, DPs for obstacle avoidance are not published. If obstacles do penetrate the slope, avoidance procedures are specified. These procedures may be: a ceiling and visibility to allow the obstacles to be seen and avoided; a climb gradient greater than 200 feet per nautical mile; detailed flight maneuvers; or a combination of the above. In extreme cases, IFR take-off may not be authorized for some runways. Climb gradients are specified when required for obstacle clearance. Crossing restrictions in the DPs may be established for traffic separation or obstacle clearance. Some DPs required for obstacle avoidance require a climb in visual conditions to cross the airport (or an on-airport NAVAID) in a specified direction, at or above a specified altitude. When climbing in visual conditions it is the pilot's responsibility to see and avoid obstacles. Specified ceiling and visibility minimums will allow visual avoidance of obstacles until the pilot enters the standard obstacle protection area. Obstacle avoidance is not guaranteed if the pilot maneuvers farther from the airport than the visibility minimum. Each pilot, prior to departing an airport on an IFR flight should consider the type of terrain and other obstacles on or in the vicinity of the departure airport and:

(a) Determine whether a DP is available for obstacle avoidance;

(b) Determine if obstacle avoidance can be maintained visually or that the DP should be followed; and

(c) Determine what action will be necessary and take such action that will assure a safe departure.

Standard Terminal Arrivals (STARs)

Pilots of IFR aircraft destined to locations for which STARs have been published may be issued a clearance containing a STAR whenever ATC deems it appropriate. Use of STARs requires pilot possession of at least the approved textual description. As with any ATC clearance or portion thereof, it is the responsibility of each pilot to accept or refuse an issued STAR. Pilots should notify ATC if they do not wish to use a STAR by placing "NO STAR" in the remarks section of the flight plan or by the less desirable method of verbally stating the same to ATC. A STAR is an ATC coded IFR arrival route established for application to arriving IFR aircraft destined for certain airports. FMSPs for arrivals serve the same purpose but are only used by aircraft equipped with FMS. The purpose of both is to simplify clearance delivery procedures and faciliate transition between enroute and instrument approach procedures.
STARs/FMSPs may have mandatory speeds and/or crossing altitutes published. Other STARs may have planning information depicted to inform pilots what clearances or restrictions to **"expect". "Expect"** altitudes/speeds are not considered STAR/FMSP crossing restrictions until verbally issued by ATC. Pilots shall maintain last assigned altitude until receiving authorization/clearance to change altitude. At that time, pilots are expected to comply with all published/issued restrictions. The authorizations may be via a normal descent clearance or the phraseology **"DESCEND VIA."** A"descend via" clearance authorizes pilots to vertically and laterally navigate, in accordance with the depicted procedure, to meet published restrictions. Vertical navigation is at pilot's discretion, however, adherence to published altitude crossing restrictions and speeds is mandatory unless otherwise cleared. (MEAs are not considered restrictions, however, pilots are expected to remain above MEAs)

Filing IFR Flight Plans with DPs and STARs

When filing an IFR flight plan, the use of the associated codified FAA DP or STAR and transition identifiers will greatly facilitate the acceptance of the flight plan in the ARTCC computer. These identifier codes are found on the respective DP and STAR charts. The following explanation and examples are the proper methods in filing DPs and STARs.

DPs: When a DP is filed without using a transition the filed identifier (code) will read as "ROCKI1.ROCKI" When a transition is used the last coded characters of the DP are replaced by the transition code and will read as "ROCKI1.MILIS

ROCKI ONE DEPARTURE — Departure Name
(ROCKI1.ROCKI) Departure Code
MILIS Transition Name
(ROCKI1.MILIS) Transition Code

STARs: When a STAR is filed without using a transition, the filed identifier (code) will read as "FIM.MOOR4". When a transition is used the first coded characters of the STAR are replaced by the transition code and will read as "FAT.MOOR4".

MOORPARK FOUR ARRIVAL — Arrival Name
(FIM.MOOR4) Arrival Code
FRESNO Transition Name
(FAT.MOOR4) Transition Code

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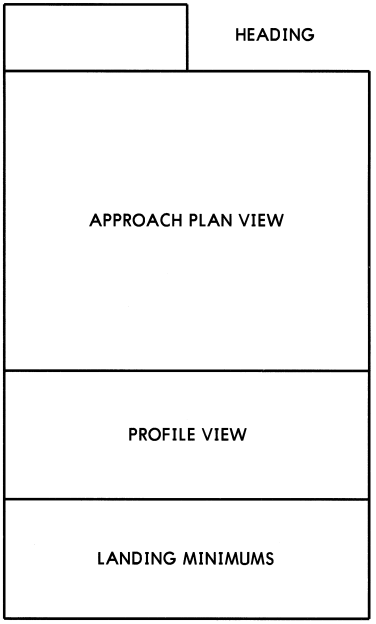
APPROACH CHART LEGEND

Approach charts are graphic illustrations of instrument approach procedures prescribed by the governing authority. All charts meet FAA requirements for aeronautical charts. The following legend pages briefly explain symbology used on approach charts throughout the world. *Not all items apply to all locations.* The approach chart is divided into specific areas of information as illustrated below.

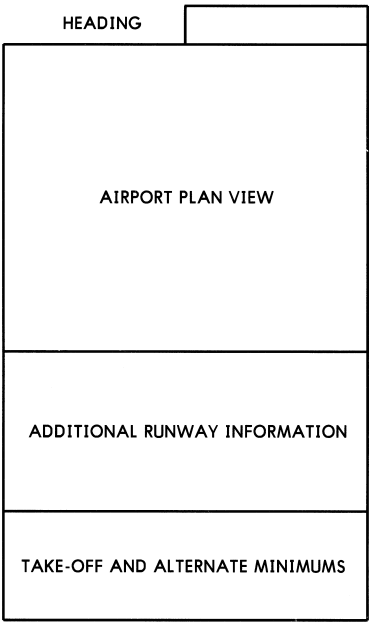
FORMATS

The first approach procedure published for an airport has the procedure chart published on the front side with the airport chart on the back side. On major airports, the airport chart may proceed the first approach procedure. These locations will have expanded airport information that may occupy more than one side. When an airport has more than one published approach procedure, they are shown front and back on additional sheets. Blank pages will indicate "INTENTIONALLY LEFT BLANK".

APPROACH PROCEDURE CHART FORMAT



AIRPORT CHART FORMAT

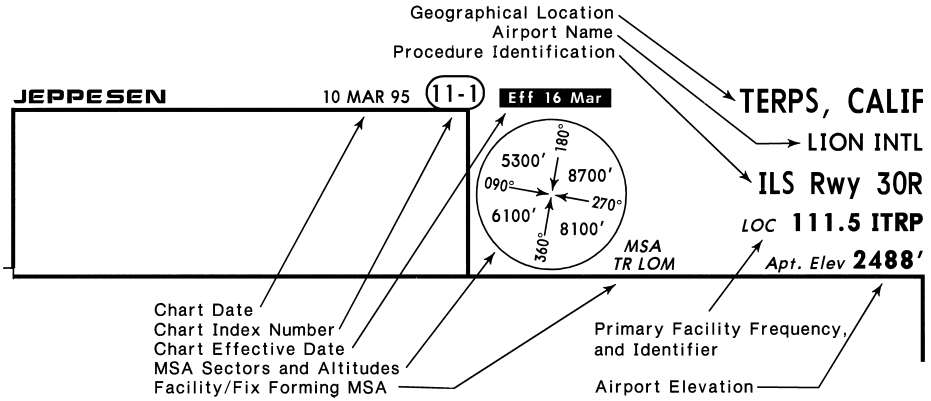


On charts dated on and after 10 MAR 95, key information is displayed in bold type. Key information includes Communication frequencies, Primary NAVAID frequency and identifier, Procedure bearings and Altitudes, Airport and runway end elevation, Decision Altitude and Minimum Descent Altitude, and Missed Approach turn limit and direction, course and altitude.

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APPROACH CHART LEGEND

HEADING



The geographical name used is generally the major city served by the civil airport or installation name if a military airport. A hyphen before the airport name is used when the location name is part of the airport name. The charts are arranged alphabetically by the geographical location served.

NOTE: U.S. Airway Manual: The civil approach charts covering the United States are arranged alphabetically *by state.* Within each state, the charts are arranged alphabetically by the name of the city served.

For each location, the charts are sequenced by the chart index number. This index number will appear as shown below:

First Digit: represents the airport number and is an arbitrary assignment.

Second Digit: represents the chart type as shown below:

0-area, SID, etc.
1-ILS, MLS, LOC, LDA, SDF, KRM
2-GPS (Sole use)
3-VOR
4-TACAN
5-RESERVED
6-NDB
7-DF
8-PAR, ASR, SRA, SRE
9-RNAV, vicinity chart, Visual Arrival or Visual Departure Chart, LORAN

Third Digit: represents the filing order of charts of the same type.

Oval outlines of chart index numbers represent:

Standard chart issued to Airway Manual subscribers.

Special chart issued to special coverages only. Contains modified information for your company.

M Standard chart that uses only metric system units of measure.

In this numerical system-both procedure and airport-there will be gaps in the filing sequence because of deletions, expected expansion, selected distribution and tailoring for specific subscribers. Two procedures may be combined. Numbering, in this case, will be for the lowest number of the pair. ILS and NDB is a typical combination indexed as 11-1, 21-1, etc.

All chart dates are Friday dates. This chart date is not to be confused with the effective date. The effective date is charted when a chart is issued prior to the changes being effective. Charts under USA jurisdiction with an effective date are effective at 0901Z of that date.

Procedure identification is given below the airport name. This identification is per the applicable authoritative source (e.g. VOR-1, NDB (ADF) Rwy 16, NDB Rwy 16, etc.). The use of an alphabetical suffix indicates a procedure does not meet criteria for straight-in landing minimums (e.g. VOR-A, VOR-B, LOC (BACK CRS)-A, etc.).

MSA provides 1000 feet of obstruction clearance within the circle (or sector) within 25 nautical miles of the facility/fix identified just to the lower right of the circle. If the protected distance is other than 25 nautical miles, the effective radius is stated beside the identifier of the central facility. The MSA value is supplied by the controlling authority.

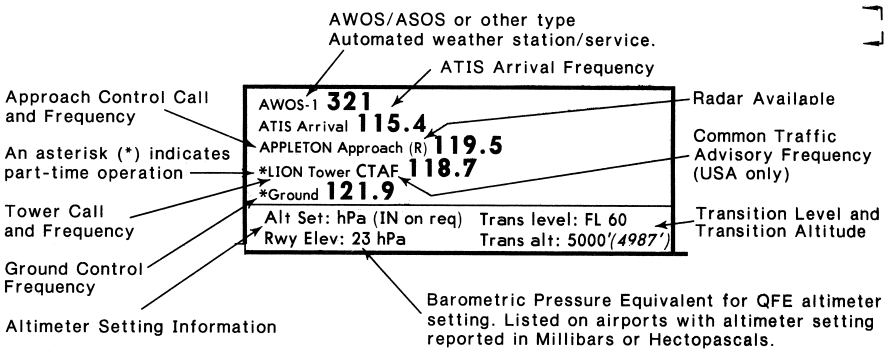
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APPROACH CHART LEGEND

HEADING (continued)

COMMUNICATION AND ALTIMETER SETTING DATA

Communications for "arrivals" are given in normal sequence of use as shown below. See Airport Chart Legend, Introduction page 116, for other communications.



Transition level and transition altitude are listed on the bottom line of the communications and altimeter setting data box. Transition level and transition altitude are provided for all areas outside the 48 conterminous United States, Alaska and Canada.

Trans level: FL 60

The transition level (QNE) is the lowest level of flight using standard altimeter setting (29.92 inches of mercury or 760 millimeters of mercury or 1013.2 millibars or 1013.2 hectopascals.)

Trans alt: 5000' *(4987')*

The transition altitude (QNH) is the altitude at and below which local pressure setting must be used.

Altimeter setting units are listed on the bottom line of communications data box.

Barometric Pressure Equivalent in millibars or hectopascals enables aircraft operators who use QFE altimeter setting for landing to establish the QFE altimeter setting by subtracting the hectopascal or millibar equivalent from the reported QNH altimeter setting. The value shown is the barometric pressure equivalent for the height reference datum for straight-in landing. The height reference datum will be the runway threshold elevation (Rwy), airport elevation (Apt) or the runway touchdown zone elevation (TDZ), as applicable.

Letter designations behind a frequency indicate operation as follows:

G-guards only
T-transmits only
X-on request

Bearings defining frequency sectors are clockwise outbound (e.g., 270° to 090° would be north of the airport.)

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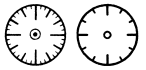
APPROACH CHART LEGEND
APPROACH PLAN VIEW

The plan view is a graphic picture of the approach, usually presented at a scale of 1 in = 5 NM. Plan views at scales other than 1 in = 5 NM are noted. Latitude and longitude are shown in 10 minute increments on the plan view neatline. Symbols used in the plan view are shown below.

NAVAIDS



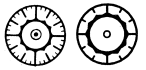
NDB (Non-Directional Radio Beacon)



VOR (VHF Omni-Directional Range)



TACAN (Tactical Air Navigation facility) or DME (Distance Measuring Equipment)



VORTAC or VORDME



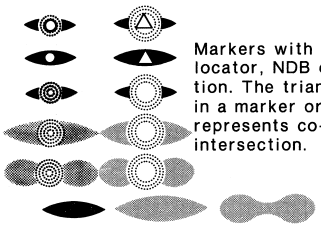
ILS, LOC, LDA, SDF, MLS or KRM Front Course



LOC Back Course

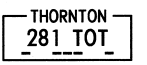


Offset Localizer



Markers with or without locator, NDB or Intersection. The triangle or circle in a marker or NDB symbol represents co-located intersection.





Navaid facility boxes include facility name, identifier, Morse code and frequency. The shadow indicates the primary facility upon which the approach is predicated. In VORTAC and VORDME facility boxes the letter "D" indicates DME capability.



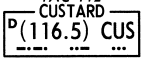
VOR, VORTAC and VORDME class is indicated by a letter "T" (Terminal), "L" (Low Altitude) or "H" (High Altitude) when available.



Underline shown below navaid identifier, indicates Beat Frequency Oscillator (BFO) required to hear Morse Code identifier.

(OP NOT CONT) or *

Indicates part-time operation.



TACAN facility box with "Ghost" VOR frequency for civil tuning of TACAN - only facilities to receive DME information.

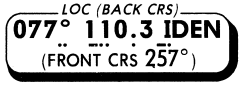


Australia Domestic DME Operates on 200 MHz and requires airborne receiver specific to this system.

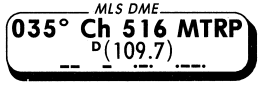
NAVAIDS (continued)



ILS, LOC, LDA, or SDF facility box. It includes inbound magnetic course, frequency, identifier, and Morse code.

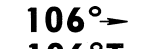


Localizer Back Course facility box. Front course included for HSI setting.



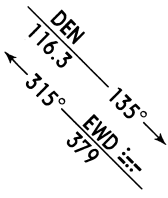
MLS facility box including inbound magnetic final approach course, MLS channel, identifier with Morse code and VHF "Ghost" frequency for manually tuning DME.

BEARINGS



Magnetic course

True course



VOR cross radials and NDB bearings forming a position fix are "from" a VOR and "to" an NDB.

Morse code ident is charted on VOR radial/NDB bearing when forming facility is outside of planview.

On charts dated on or after 10 MAR 95, General procedure NOTES are contained within a single box in the planview. NOTES specific to a single item on the chart are associated with that item.

RADAR required.
Use ITRP ILS DME when on LOC course.
Pilot controlled lighting.

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APPROACH CHART LEGEND
APPROACH PLAN VIEW (continued)

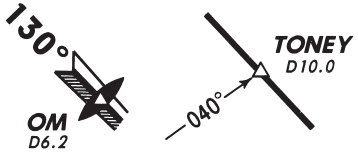
AIRSPACE FIXES

Non-Compulsory Airspace Fixes

Compulsory Airspace Fixes

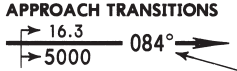
Fly-over Airspace Fixes

DME value will be portrayed as D10.0. When fix and co-located navaid names are the same, only the navaid name is displayed.



Allowable substitutions for identifying a fix are noted in the planview. At the pilot's request, where ATC can provide the service, ASR may be substituted for the OM. In addition, PAR may be substituted for OM and MM.

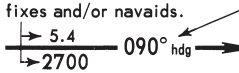
APPROACH TRANSITIONS



NM distance and minimum altitude between fixes and/or navaids.

Magnetic course

Magnetic heading



Route without facility guidance.



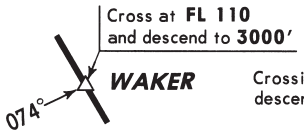
Route without minimum altitude. Altitude to be assigned by ATC.

(IAF) Initial Approach Fix

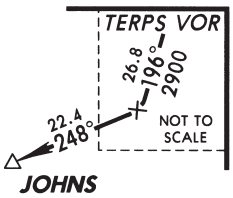
(IF) Intermediate Approach Fix

NoPT — No procedure turn, Race Track Pattern or any other type of course reversal procedure required or authorized without ATC clearance.

❶ Flag notes -see applicable reference notes elsewhere on the plan view.

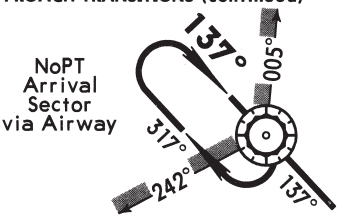


Crossing altitude and descent instructions.



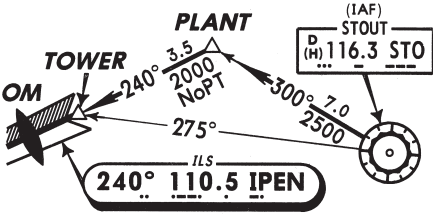
Approach transition inset. (Dog leg route, with off-chart turn). Also provided when route originates at an off-chart intersection designated only for approach use - such fixes are not charted on enroute and area charts.

APPROACH TRANSITIONS (continued)

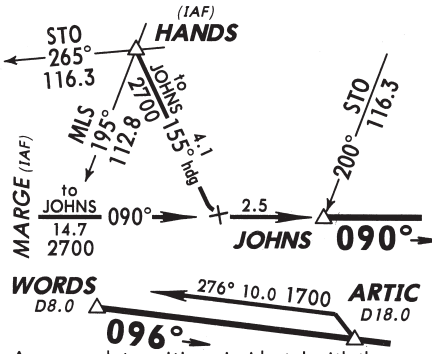


NoPT arrival sectors depict an area of approach transition routing to an approach fix. No procedure turn, Race Track Pattern or any type course reversal is required nor authorized without ATC clearance when an arrival course is within the charted sector and on an established airway radial to the fix.

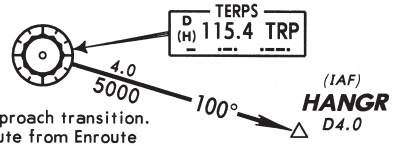
Approach transition track, distance, and altitude from a defined fix is illustrated below.



Note that the routes from STO to Plant to Tower are approach transitions, whereas the STO R-275° is not an approach transition. The STO R-275° has a small arrowhead and is a cross radial forming Tower. The STO R-300° has a large and small arrowhead indicating both an approach transition and a cross radial forming Plant. Plant and Tower are also formed by the IPEN localizer course.



An approach transitioncoincidental with the approach procedure flight track is charted offset from the flight track for clarity.



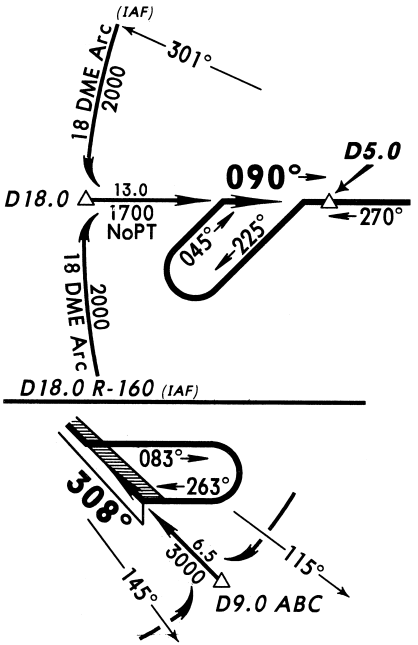
Approach transition. Route from Enroute Navaid or Fix to Initial Approach Fix (IAF).

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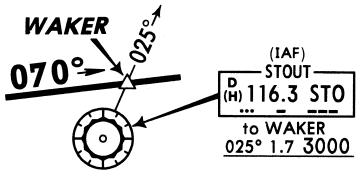
APPROACH CHART LEGEND
APPROACH PLAN VIEW (continued)

APPROACH TRANSITIONS (continued)

Approach transitions via DME arcs are illustrated below with distance from facility, direction of flight, start and termination points of the arc. DME arc altitude is maintained until established on approach course.



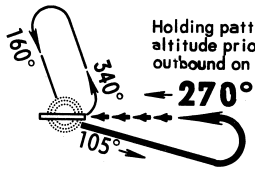
Lead radials may be provided as an advisory point for turning to the approach course.



Approach transitions may be described under the originating navaid with course, distance, altitude, and terminating point.

APPROACH PROCEDURE FLIGHT TRACK

The approach procedure flight track is portrayed by a bold line. This track begins in the plan view at the same location where the profile begins.



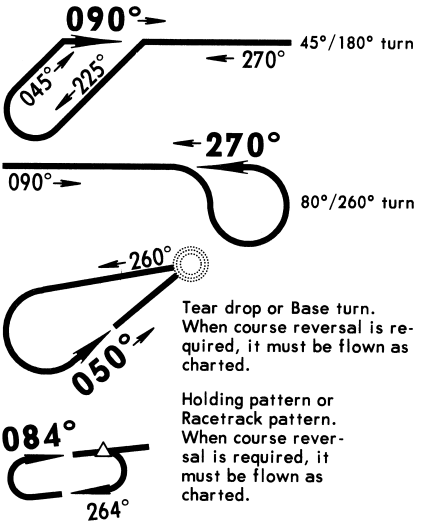
Holding pattern used to lose altitude prior to proceeding outbound on the approach.

High level approach track

Visual flight track

PROCEDURE TURNS - COURSE REVERSALS

Schematic portrayal of procedure turn



When a procedure turn, Racetrack pattern, Teardrop or Base turn is not portrayed, they are not authorized.

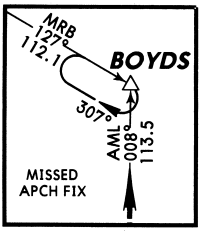
ALTITUDES

2300′	All altitudes in the plan view are "MINIMUM" altitudes unless specifically labeled otherwise. Altitudes are above mean sea level in feet. May be abbreviated "MIM".
MANDATORY 2400′	Mandatory altitudes are labeled "MANDATORY" and mean at the fix or glide slope intercept.
MAXIMUM 1900′	Maximum altitudes are labeled "MAXIMUM". May be abbreviated "MAX".
RECOMMENDED 2000′	Recommended altitudes are labeled "RECOMMENDED".

MISSED APPROACH

Initial maneuvering course for missed approach. Details of the missed approach are specified below the profile diagram.

Missed approach fix inset.



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APPROACH CHART LEGEND
APPROACH PLAN VIEW (continued)

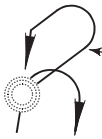
HOLDING PATTERN



Holding pattern not part of the approach procedure. DME figures, when provided, give the DME distance of the fix as the first figure followed by the outbound limit as the second figure. 3000 indicates the minimum holding altitude, (MHA).



Length of holding pattern in minutes when other than standard.



Holding patterns are generally not charted to scale.

Indicates procedure for leaving the holding pattern.

AIRPORTS

IFR airports in the area and VFR airports underlying the final approach are depicted.



Airport to which the approach is designed



Nearby Military airport



Nearby Civil or joint use Military airport



Heliport



Civil Seaplane Base



Military Seaplane Base



Airport with light beacon

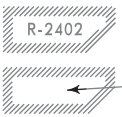


Abandoned or closed airport



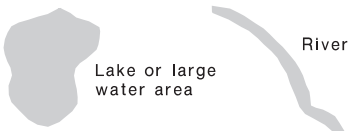
An airport reference circle, 5 statute miles in radius, centered on the airport. Omitted after 1 OCT 93.

AIRSPACE



Restricted airspace (Refer to the enroute chart for limitations.)

ORIENTATION DETAILS



★ Aeronautical Light/Beacon

TERRAIN HIGH POINTS AND MAN-MADE STRUCTURES

1. Some, but not all, terrain high points and man-made structures are depicted, along with their elevation above mean sea level. THIS INFORMATION DOES NOT ASSURE CLEARANCE ABOVE OR AROUND THE TERRAIN OR MAN-MADE STRUCTURES AND MUST NOT BE RELIED ON FOR DESCENT BELOW THE MINIMUM ALTITUDES DICTATED BY THE APPROACH PROCEDURE. Generally, terrain high points and man-made structures less than 400 feet above the airport elevation are not depicted.

TERRAIN HIGH POINTS AND MAN-MADE STRUCTURES (continued)

2. Symbols for terrain high points and man-made structures:



Natural terrain (peak, knoll, hill, etc.) Used prior to August 12, 1988.

Unidentified natural terrain or man-made. Used prior to August 12, 1988.

Natural terrain (peak, knoll, hill, etc.) Used after August 12, 1988.



Man-made (tower, stack, tank, building, church)



Unidentified man-made structure

4460′ Mean Sea Level elevation at top of terrain high point/ man-made structure.

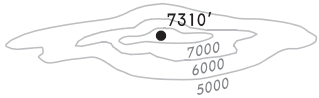
± Denotes unsurveyed accuracy



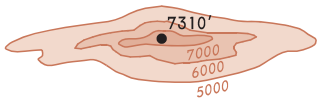
Arrow indicates only the highest of portrayed terrain high points and man-made structures in the charted planview. Higher terrain or man-made structures may exist which have not been portrayed.

GENERALIZED TERRAIN CONTOURS

1. Generalized terrain contour information may be depicted when terrain within the approach chart planview exceeds 4000 feet above the airport elevation, or when terrain within 6 nautical miles of the Airport Reference Point (ARP) rises to a least 2000 feet above the airport elevation. THIS INFORMATION DOES NOT ASSURE CLEARANCE ABOVE OR AROUND THE TERRAIN AND MUST NOT BE RELIED ON FOR DESCENT BELOW THE MINIMUM ALTITUDES DICTATED BY THE APPROACH PROCEDURE. Furthermore, the absence of terrain contour information does not ensure the absence of terrain or structures.
2. Terrain features are depicted using one of the two following methods:
   a) Prior to June 24, 1994, terrain information was depicted as gray contour lines with contour values.



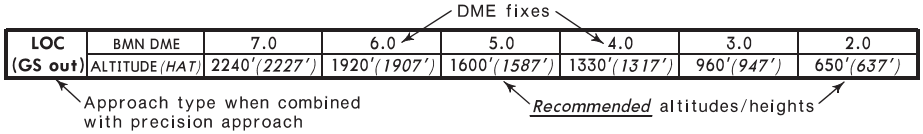
   b) After June 24, 1994, gray contour lines will gradually be replaced with brown contour lines, values, and gradient tints printed in brown. Gradient tints indicate the elevation change between contour intervals.



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APPROACH CHART LEGEND
PROFILE VIEW

The top of the profile view on certain *non-precision* approaches contains a table of *recommended* altitudes/heights at various DME fixes to allow a constant rate of descent. The altitudes/heights are *recommended* only; minimum altitudes in the profile view apply. The table is sequenced in the same direction as the profile is portrayed.

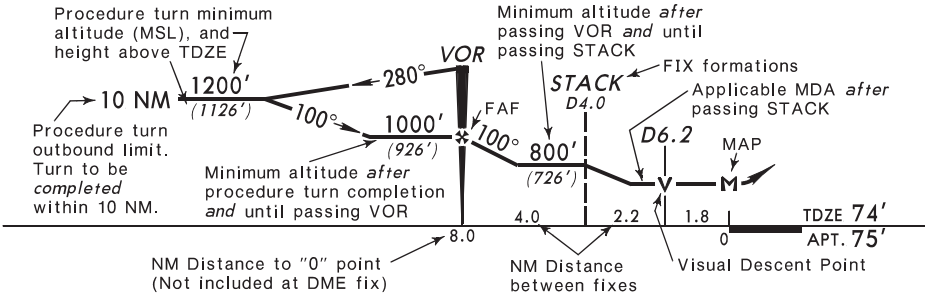


Notes pertaining to conditional use of the procedure are shown at the top of the profile. The note "Pilot controlled lighting" indicates that pilot activation is required as specified on the airport chart under Additional Runway Information.

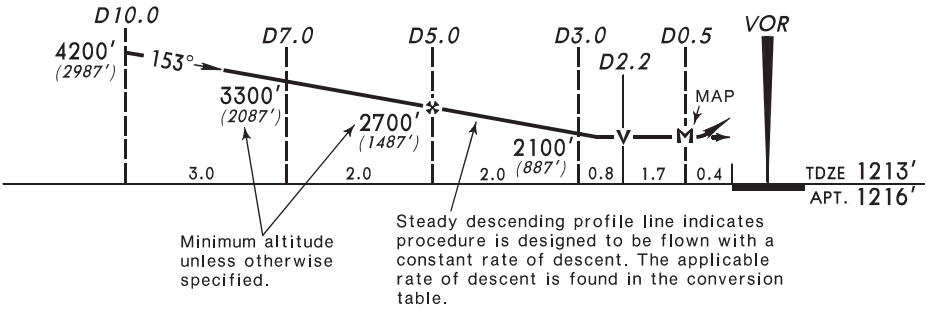
The profile view schematically (not to scale) portrays the approach procedure flight track as a vertical cross section of the plan view.

NON-PRECISION APPROACH PROFILE (LOC, VOR, VORTAC, NDB, etc.)

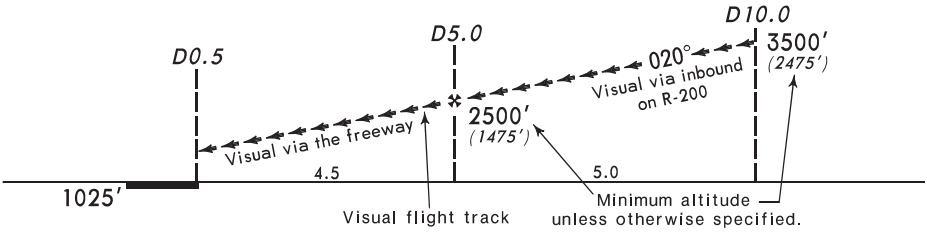
M symbol representing the non-precision missed approach point (MAP), as shown below, is used on charts dated on or after 5 FEB 93. This symbol is omitted when more than one non-precision approach track is depicted.



NON-PRECISION APPROACH PROFILE (LOC, VOR, VORTAC, NDB, etc.)
with constant rate of descent



NON-PRECISION APPROACH PROFILE (VISUAL APPROACH)

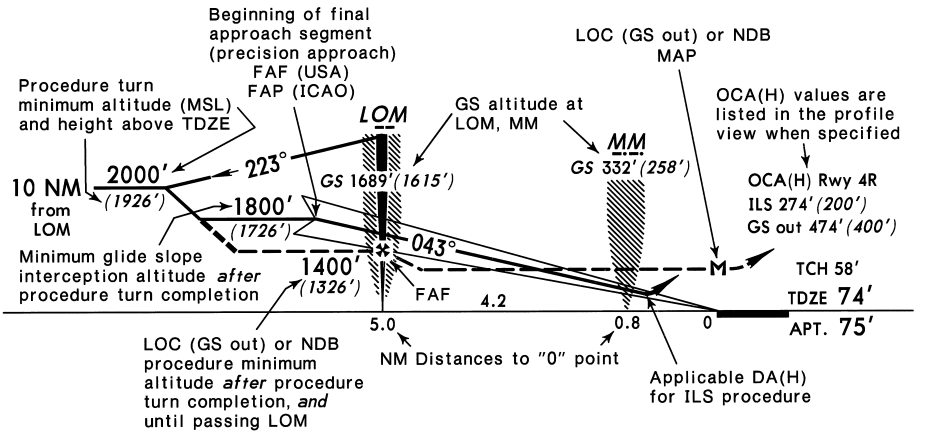


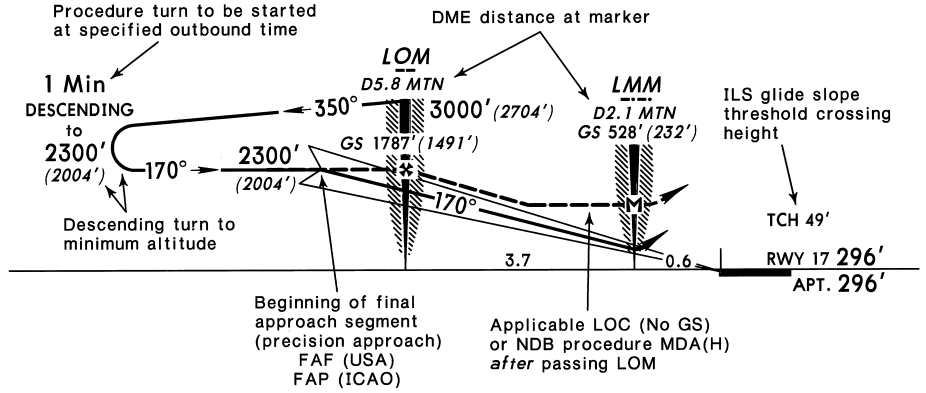
© JEPPESEN SANDERSON, INC., 1994. ALL RIGHTS RESERVED.

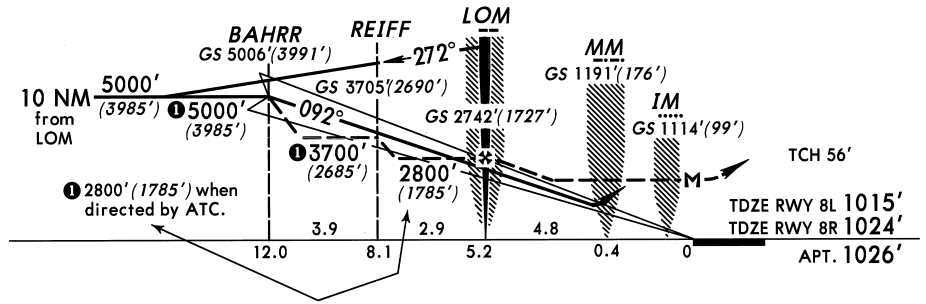
APPROACH CHART LEGEND
PROFILE VIEW (continued)

PRECISION APPROACH PROFILE [ILS with LOC (GS out), or with NDB Approach]

M symbol representing the non-precision missed approach point (MAP), as shown below, is used on charts dated on or after 5 FEB 93. This symbol is omitted when more than one non-precision approach track is depicted.





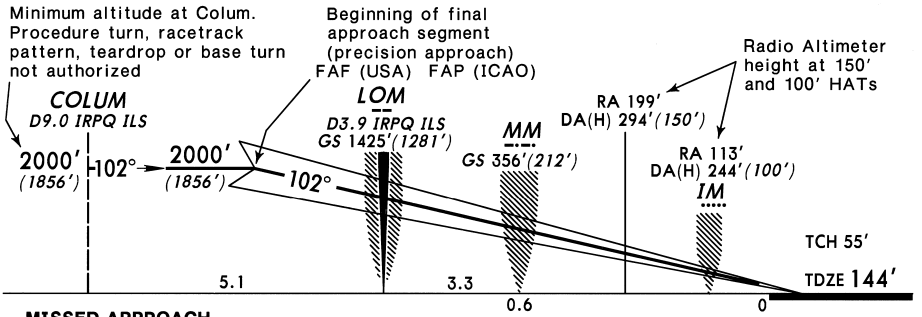


When ATC directs the lower noted altitude: For precision approaches, the altitude becomes the minimum glide slope intercept altitude and the resultant actual point of glide slope intercept becomes the FAF (USA).

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APPROACH CHART LEGEND PROFILE VIEW (continued)

PRECISION APPROACH PROFILE (ILS CAT II and CAT III combined)



MISSED APPROACH

The Missed Approach text is located immediately below the profile diagram. It may be supplemented by a State specified acceleration altitude/height on charts labeled PANS OPS / PANS OPS 3. (Refer to Air Traffic Control series "200").

MISSED APPROACH POINT (MAP)

Precision approaches: Immediately upon reaching the Decision Altitude (Height) DA(H) while descending on the glide slope and continued descent cannot be controlled by visual reference.

Non-precision approaches: Upon reaching the Missed Approach Point (MAP). A table at the lower left corner of the chart will specify the MAP and, if applicable, a time at various speeds from fix to MAP. When times are not shown, a timed approach is Not Authorized. Where a DME Fix is portrayed in addition to a distance, the DME Fix may be used for determining the MAP for DME equipped aircraft. The runway threshold and MAP often coincide.

SYMBOLS

TCH — Threshold Crossing Height

LAKE — Fan marker with name or ILS marker with marker code and, when appropriate, glide slope crossing altitude above mean sea level and above TDZE, runway end or airport elevation.

VOR — VOR, DF, NDB, or Waypoint labeled only as to facility depicted. "Z" indicates VHF location markers.

LOM — Marker and NDB co-located (LOM, LMM)

VOR — VOR not used for course guidance, by-passed during final approach, and used solely to provide DME fixes both before and after its passage.

-or-

Facility used solely for start of outbound procedure track, with procedure turn or course reversal and final approach inbound to another facility.

SYMBOLS (continued)

REDOE D5.8 — Named fix formed by VOR radial or NDB bearing, or DME, or radar.
All allowable substitutions for identifying a fix are noted in the planview. Only DME values will be displayed in the profile. Note: ILS DME should *not* be used to determine position over middle marker, runway threshold or runway touchdown point unless specified on the approach chart.

✱ — Non-precision Final Approach Fix (FAF) (If specified by State source)

D2.0 V — Visual Descent Point (VDP) (if specified by State source)

Begin missed approach procedure.

D1.0 M — **M** symbol represents the non-precision missed approach point (MAP), on charts dated on and after 5 FEB 93.

Approach procedure flight track

Approach procedure flight track of non-precision approach [LOC (GS out), NDB or VOR] when charted in same profile with precision approach.

High level approach track

Visual flight track (One or more arrows)

See INTRODUCTION page NEW FORMAT-5 for VERTICAL NAVIGATION (VNAV) explanation.

[3.00°] — geometric descent path and descent angle

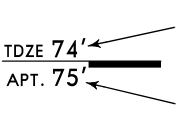
[3.00°] — geometric descent path and descent angle to Decision Altitude (DA) for approved operators.

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APPROACH CHART LEGEND
PROFILE VIEW (continued)

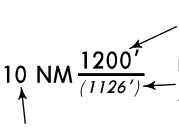
SYMBOLS (continued)

2300′	All altitudes in the profile view are "MINIMUM" altitudes unless specifically labeled otherwise. Altitudes are above mean sea level in feet. May be abbreviated "MIM".
MANDATORY 2400′	Mandatory altitudes are labeled "MANDATORY" and mean at the fix or glide slope intercept.
MAXIMUM 1900′	Maximum altitudes are labeled "MAXIMUM". May be abbreviated "MAX".
OCL Rwy 04R 274′ *(200′)*	Obstruction Clearance Limit
OCA(H) Rwy 26 720′ *(263′)*	Obstruction Clearance Altitude (Height)
RECOMMENDED 2000′	Recommend altitudes are labeled"RECOMMENDED".
(1200′)	Height in feet above airport, runway end, or TDZ elevation. Height is measured from airport elevation unless TDZE or runway end elevation is noted at the airport symbol.



Touchdown Zone Elevation. (Runway End or Threshold Elevation when labeled RWY).

Official Airport Elevation

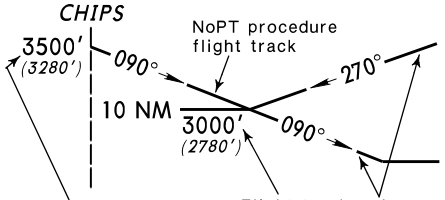


Procedure turn minimum altitude (MSL)

Height above TDZE, runway end, runway threshold, or airport.

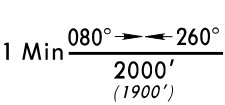
Procedure turn outbound limit. When the outbound procedure track is depicted in the profile view, the turn limit is from the fix where the outbound track begins. The turn must be carried out within the specified distance.

Combined procedure turn (course reversals) and NoPT procedure flight tracks



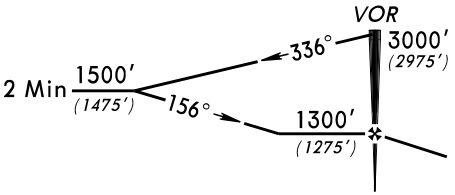
Minimum altitude at fix.

Flight tracks when procedure turn is used



Racetrack used in lieu of procedure turn with holding limit, outbound and inbound bearings, and minimum altitude.

For a racetrack and holding in lieu of procedure turn, the outbound track corresponds to the plan view depiction beginning at a point abeam the facility/fix.

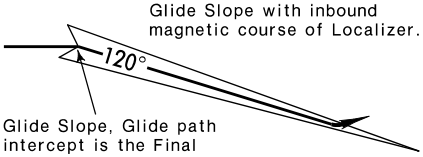


Procedure based on 120 KT TAS.

When airspeeds are indicated in profile note, higher airspeeds require shortened times to assure remaining in the protected area.

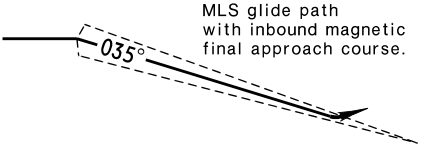
Radar required.

Radar vectoring is required when it is the only approved method for providing a procedure entry and/or for identifying a terminal fix.



Glide Slope with inbound magnetic course of Localizer.

Glide Slope, Glide path intercept is the Final Approach Fix (FAF USA), Final Approach Point (FAP ICAO) for precision approaches. The glide slope symbol starts at the FAF/FAP.



MLS glide path with inbound magnetic final approach course.

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APPROACH CHART LEGEND
LANDING MINIMUMS

GENERAL

Publication of minimums does not constitute authority for their use by all operators. Each individual operator must obtain appropriate approval for their use.

DEFINITIONS

A, B, C, D____Aircraft categories (See Chart Glossary)
AZ (GP out)____Azimuth (Glide path out) on MLS approach.
ALL Non Skd____All Non Scheduled. These minimums apply for Mexico ILS approaches only.
ALS out____Approach lights out of service
CAT I ILS____CAT I ILS approach
CAT II ILS____CAT II ILS approach
CAT IIIA ILS____CAT IIIA ILS approach
CEILING REQUIRED____Indicates that a ceiling is required for landing.
CIRCLE-TO-LAND____Circling landing minimums applicable for all runways
**DA*____Decision Altitude - MSL altitude
**DA(H)*____Decision Altitude (Height)
**DH*____Decision Height - MSL Altitude
FULL____All components of ILS are operating
HIRL out____High Intensity Runway Lights out of service
ILS____ILS approach
LOC (GS out)____Localizer approach (ILS without GS)
**MDA*____Minimum Descent Altitude - MSL altitude
**MDA(H)*____Minimum Descent Altitude (Height)
MM out____MM out of service and no legal substitutions available
MLS____MLS approach
NA____Not authorized
NOT APPLICABLE____Condition does not apply
NDB____NDB approach
ODALS out____ODAL approach lights out of service
RA____Radio Altimeter (height above ground)
RAIL out____RAIL portion of approach lights out of service
RMS____RMS approach
STRAIGHT-IN LANDING RWY____Runway for which charted minimums apply
TDZ or CL out____Touchdown Zone lights or centerline lights out of service
( )____Numbers in parentheses represent Height Above Touchdown (HAT) or Height Above Threshold or Height Above Airport (HAA).

*DA(H) and MDA(H) are used exclusively starting with charts dated 28 July 1989.

STRAIGHT-IN LANDING

All Charts
All authorized minimums and applicable conditions for each approach procedure are provided within the chart minimum table.

The first column, at the left, shows the lowest authorized minimum. Succeeding columns to the right will show increasing minimums adjusted to the applicable condition. Installed approach lights or landing aids that affect or may affect minimums are listed in the column headings as "ALS out," "MM out," etc. When two or more installed landing aids are out, the highest "out" condition minimum applies.

On approach charts dated prior to 24 AUG 90, installed approach lights that did not require a minimum adjustment were omitted from the minimum headings. Charts dated 24 AUG 90 and after will provide column heading conditions for installed approach lights even though a minimum adjustment is not required.

Altimeter setting requirements or other special conditions may alter the sequence of the minimums. A review of all notes and minimum box titles should always be made.

ILS CHARTS

When the glide slope of an ILS is "out" the column heading is identified as a localizer approach with glide slope out - "LOC (GS out)".

In the United States, effective 15 October 1992, there is no longer any penalty imposed for an "MM out". The "MM out" column is being removed from U.S. charts beginning with the 9 October 1992 revision, effective 15 October 1992.

The following countries impose higher minimums for the "MM out" condiion.

Brazil	Paraguay	Yemen Arab
Bulgaria	Saudi Arabia	Republic
Costa Rica	Suriname	
Ecuador	Taiwan	
Israel	Uruguay	

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APPROACH CHART LEGEND LANDING MINIMUMS (continued)

USA FORMAT - Prior to 15 October 1992 Effective date.

	STRAIGHT-IN LANDING RWY 36L						CIRCLE-TO-LAND	
	ILS				LOC (GS out)			
	DA(H) 212′ (200′)			DA(H) 262′ (250′)	MDA(H) 400′ (388′)			
	FULL	TDZ or CL out	ALS out	MM out		ALS out	Max Kts	MDA(H)
A	RVR 18 or 1/2	RVR 24 or 1/2	RVR 40 or 3/4	RVR 24 or 1/2	RVR 24 or 1/2	RVR 50 or 1	90	560′ (533′)-1
B							120	
C							140	560′ (533′)-1 1/2
D				RVR 40 or 3/4	RVR 40 or 3/4	RVR 60 or 1 1/4	165	580′ (553′)-2

USA FORMAT - Effective 15 October 1992 and all succeeding revisions.

	STRAIGHT-IN LANDING RWY 36L					CIRCLE-TO-LAND	
	ILS			LOC (GS out)			
	DA(H) 212′ (200′)			MDA(H) 400′ (388′)			
	FULL	TDZ or CL out	ALS out		ALS out	Max Kts	MDA(H)
A	RVR 18 or 1/2	RVR 24 or 1/2	RVR 40 or 3/4	RVR 24 or 1/2	RVR 50 or 1	90	560′ (533′)-1
B						120	
C						140	560′ (533′)-1 1/2
D				RVR 40 or 3/4	RVR 60 or 1 1/4	165	580′ (553′)-2

WORLD-WIDE FORMAT

	STRAIGHT-IN LANDING RWY 36L					CIRCLE-TO-LAND	
	ILS			LOC (GS out)			
	DA(H) 212′ (200′)			MDA(H) 400′ (388′)			
	FULL	TDZ or CL out	ALS out		ALS out	Max Kts	MDA(H)
A	RVR 550m VIS 800m	RVR 720m VIS 800m	1200m	RVR 720m VIS 800m	RVR 1500m VIS 1600m	100	560′ (533′) -1600m
B						135	
C						180	630′ (603′) -2800m
D				1200m	RVR 1800m VIS 2000m	205	730′ (703′) -3600m

SIDESTEP INOPERATIVE COMPONENTS

For a runway identified as sidestep, such as SIDESTEP RWY 24L:
Inoperative light components shown in Rwy 24L column are those for the lights installed on *Rwy 24L, not* the lights for Rwy 24R.

CIRCLE-TO-LAND

Starting with charts dated July 28, 1989, *maximum aircraft speeds* for circling are shown in lieu of Aircraft Approach Categories. The maximum indicated airspeeds are shown in knots (kilometers per hour on Metric Edition charts).

U.S. STANDARD FOR TERMINAL INSTRUMENT APPROACH PROCEDURES (TERPS)

CIRCLE-TO-LAND	
Max Kts	MDA(H)
90	560′ (533′)-1
120	
140	560′ (533′)-1 1/2
165	580′ (553′)-2

NEW INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) FLIGHT PROCEDURES

CIRCLE-TO-LAND	
Max Kts	MDA(H)
100	560′ (533′) -1600m
135	
180	630′ (603′) -2800m
205	730′ (703′) -3600m

Known deviations to the above speeds are charted. For the few countries that have not published maximum circling speeds, aircraft approach categories A,B,C and D will continue to be shown.

Aircraft Approach Categories in the straight-in minimum column can be read across the chart from left to right for referencing the circle-to-land information.

The fact that straight-in-minimums are not published does not preclude the pilot from landing straight-in, using published circling minimums, if he has the straight-in runway in sight in sufficient time to make a normal approach for landing. Under such conditions, and when Air Traffic Control has cleared him for landing on that runway, he is not expected to circle even though straight-in minimums are not published. If he desires to circle, he should advise ATC.

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APPROACH CHART LEGEND
LANDING MINIMUMS (continued)

CEILING MINIMUMS

In some parts of the world a minimum "ceiling" is required as well as a minimum visibility. Ceiling measurement is reported as height above ground and therefore may not be the same value as the height above touchdown (HAT) or height above airport (HAA). The ceiling minimums shown in the minimums format are in feet or meters according to the way they are reported.

The ceiling requirement is highlighted:

CEILING REQUIRED

VISIBILITY

Visibility for any approach condition is shown below the condition in a band for each aircraft category or each maximum circling speed Visibility is shown alone, or in addition to RVR. When a governing authority specifies visibility minimums in meters or kilometers, an "m" or "Km" is charted after the specified visibility. When statute or nautical miles are specified, no units are charted; e.g., a specified visibility of "1" means "1 mile."

RUNWAY VISUAL RANGE

Runway Visual Range (RVR) is to be used instead of reported visibility for operating on any runway for which RVR is given. The figures shown with RVR represent readings in hundreds of feet, as RVR 24 meaning 2400 feet RVR, or readings in metric units as RVR 550m meaning 550 meters RVR.

RVR visibility values are charted only when the value is not the same as the prevailing or meteorological visibility value. When a difference occurs, the respective RVR and prevailing or meteorological visibility values are prefixed with "RVR" and "VIS". When there is no difference, the minimum is shown only once and means either RVR (if RVR is reported for that runway) or visibility if measured otherwise.

RVR for non-precision and for precision landing minimums (other than Category II or III):

(1) Touchdown RVR reports, when available for a particular runway, are controlling.

(2) The Mid RVR and Rollout RVR reports (if available) provide advisory information to pilots. The Mid RVR report may be substituted for the TDZ RVR report if the TDZ RVR report is not available.

RVR for Category II operations:

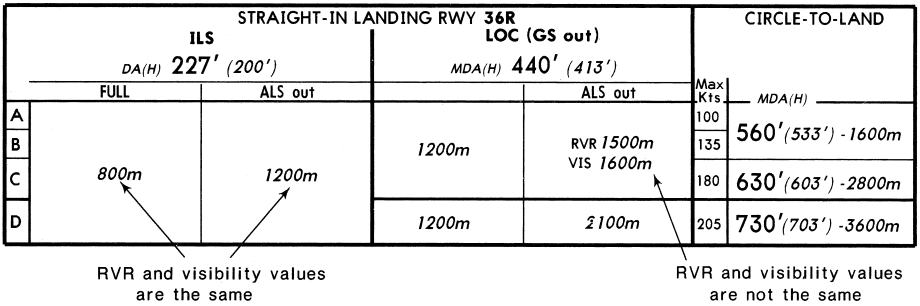
(1) For authorized landing minimums of RVR 16 or 500m, the Touchdown Zone RVR reporting system is required and must be used. This RVR report is controlling for all operations.

(2) For authorized landing minimums of RVR 12 or 350m, the Touchdown Zone and the Rollout RVR reporting systems are required and must be used. The Touchdown Zone RVR report is controlling for all operations and the Rollout RVR report provides advisory information to pilots. The Mid RVR report (if available) provides advisory information to pilots and may be substituted for the Rollout RVR report if the Rollout RVR report is not available.

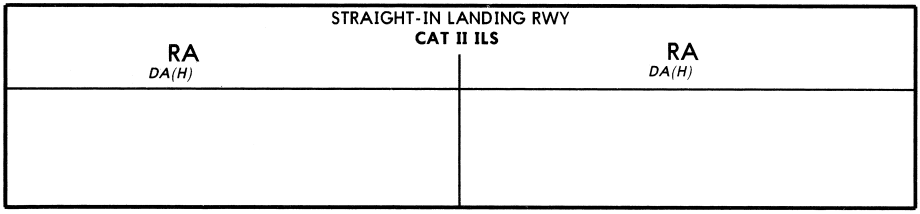
METRIC MINIMUMS

Where weather conditions are reported in meters, approved metric minimums are shown in lieu of feet and fractional miles.

Metric minimums (ceiling, visibility, and RVR) are not abbreviated but are shown as complete values.



Format for ILS CAT II



The left column lists the lowest available CAT II minimum, normally DH 100, visibility RVR 12 (350m). The right column lists the CAT II minimum applicable when certain airborne equipment is out of service or when pilot and operator requirements preclude the use of lower minimum. This minimum is normally DH 150, visibility RVR 16 (500m).

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APPROACH CHART LEGEND
LANDING MINIMUMS (continued)

CONVERSION TABLE

At the bottom of the approach chart page, there is a conversion table as shown below.

Gnd speed-Kts	*70*	*90*	*100*	*120*	*140*	*160*
GS 2.50°	315	405	450	541	631	721
LOM to MAP 5.0	4:17	3:20	3:00	2:30	2:09	1:53

The speed table relates aircraft approach speeds to the rate of descent for the ILS glide slope (descent in feet per minute). For non-precision approaches it relates speed to the distance shown from the final approach fix (FAF) or other specified fix to the missed approach point (MAP).

Gnd speed-Kts	*70*	*90*	*100*	*120*	*140*	*160*
VOR to MAP 3.9	3:21	2:36	2:20	1:57	1:40	1:28

Some missed approach points are calculated on a time/speed basis after completion of the procedure turn inbound on final approach. The absence of a time/speed table means the MAP cannot be determined by time and a timed approach in Not Authorized.

Gnd speed-Kts	*70*	*90*	*100*	*120*	*140*	*160*
Descent rate D7.0 to D3.0	466	600	667	800	934	1067
MAP at D1.5						

Non-precision approaches designed to be flown at a constant rate of descent have a rate of descent provided in the conversion table. The conversion table specifies a rate of descent that allows arrival at minimum altitudes shown in the profile view. The descent rate is a recommended rate only. Minimum altitudes shown in the profile view apply.

Gnd speed-Kts	*70*	*90*	*100*	*120*	*140*	*160*
Rwy 5, 23, PAR GS 2.50°	315	405	450	541	631	721
Rwy 30 PAR GS 2.55°	322	413	459	551	643	735

On PAR charts:
Speed table with rates of descent on PAR glide slope is provided.

Gnd speed-Kts	*70*	*90*	*100*	*120*	*140*	*160*
Descent Gradient 5.9%	418	538	597	717	836	956
MAP at VOR						

When provided by the State, a non-precision descent gradient is provided with a descent table in feet per minute.

Gnd speed-Kts	*70*	*90*	*100*	*120*	*140*	*160*
ILS GS 3.00° or LOC Descent Gradient 5.2%	377	484	538	644	753	861
MAP at MM						

For combined ILS and non-precision approaches, only one descent table is provided when the ILS glide slope angle and the descent gradient are coincidental.

Gnd speed-Kts	*70*	*90*	*100*	*120*	*140*	*160*
Glide path Angle 3.00°	377	485	539	647	755	863
FAF to MAP 5.1	4:22	3:24	3:04	2:33	2:11	1:55

On MLS charts the Glide path angle authorized for the procedure and rate of descent table is provided.

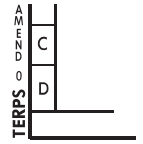
INSTRUMENT APPROACH PROCEDURE DESIGN INDICATOR
PANS-OPS or TERPS

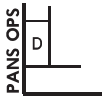
The "PANS-OPS" margin notation indicates that the State has specified that the instrument approach procedure complies with the ICAO Procedures for Air Navigation Services - Aircraft Operations (PANS OPS) DOC 8168, Volume II, 1st or 2nd Edition. Aircraft handling speeds for these procedures are shown on Introduction Page 2 under "AIRCRAFT APPROACH CATEGORY (ICAO)". Known deviations to these handling speeds are charted.

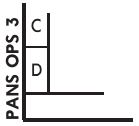
"PANS OPS 3" further indicates that holding speeds to be used are those specified in DOC 8168, Volume II, 3rd Edition.

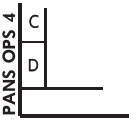
"PANS OPS 4" further indicates that the acceleration segment criteria have been deleted as formerly published in DOC 8168, Volume II, 3rd Edition. Jeppesen Air Traffic Control ("200" Series) pages provide an extract of the latest PANS OPS DOC 8168, Volume I and the earlier version, concerning holding speeds. Holding speed tables for both the earlier edition and the later editions 3 and 4 of PANS OPS are included in these pages.

"TERPS" indicates that the State has specified that the instrument approach procedure complies with the United States Standard for Terminal Instrument Procedures. **Note:** Charts dated prior to 21 NOV 03 do not include a **TERPS** margin notation.









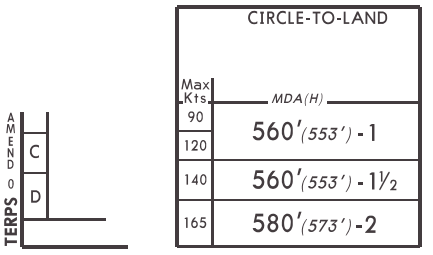
Note: For charts dated on or after 21 NOV 03, the absence of a PANS OPS or TERPS margin notation means the instrument approach design criteria are unknown.

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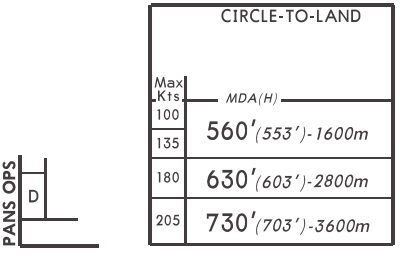
APPROACH CHART LEGEND
CIRCLE-TO-LAND
ICAO PANS OPS or TERPS

The Instrument Approach Procedure margin also indicates whether PANS OPS or TERPS criteria have been applied for the construction of the circling area. Maximum aircraft speeds for circling are shown in lieu of aircraft approach categories. The maximum indicated airspeeds (IAS) are shown in knots and any known deviations to the speeds are charted. For the few countries that have not published maximum circling speeds, aircraft approach categories A, B, C and D will continue to be shown. Aircraft approach categories in the straight-in column can be read across the chart from left to right for referencing the circle-to-land information. The fact that straight-in minimums are not published does not preclude the pilot from landing straight-in, using published circling minimums, if the straight-in runway is in sight with sufficient time to make a normal approach for landing. Under such conditions, and when Air Traffic Control has provided clearance to land on that runway, the pilot is not expected to circle even though straight-in minimums are not published. However, if a circling maneuver is desired, the pilot should advise ATC.

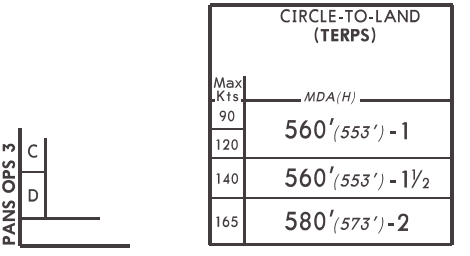
U.S. Standard for Terminal Instrument Procedures (TERPS)



ICAO Procedures for Air Navigation Services – Aircraft Operations (PANS OPS)



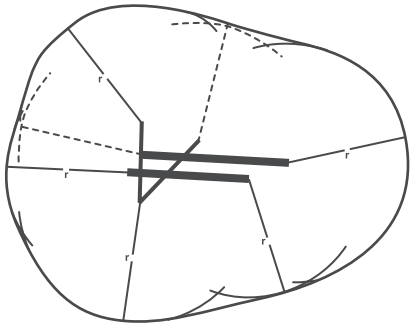
Different design standards may be applied for the approach procedure than for the circling areas. In those exceptional cases, an additional label in the heading of the circling minimums box will indicate the criteria which have been applied for the construction of the circling area.



In this example, the instrument approach procedure complies with ICAO PANS OPS criteria, whereas the circling areas are constructed based on TERPS criteria.

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APPROACH CHART LEGEND
CIRCLING AREA TERPS VERSUS ICAO PANS OPS
MAXIMUM SPEEDS/DIMENSIONS



TERPS Average bank angle 25˚		ICAO PANS OPS Average bank angle 20˚	
MAX IAS – Circling Area Radius (r) from Threshold			
90 Kts	1.3 NM	100 Kts	1.68 NM
120 Kts	1.5 NM	135 Kts	2.66 NM
140 Kts	1.7 NM	180 Kts	4.20 NM
165 Kts	2.3 NM	205 Kts	5.28 NM

(End of Approach Chart Landing Minimums)

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APPROACH CHART LEGEND
AIRPORT CHART FORMAT

The airport chart is typically printed on the reverse side of the first approach chart in the series. At many airports, especially large terminals, the airport chart will precede the first approach chart and contain an enlarged diagram. Airport charts depict communications frequencies as well as runway, taxiway and ramp information. Additionally, approach and runway lighting, declared distances, IFR and obstacle departure procedures, and take-off and alternate minimums are shown. In the example of a chart with an enlarged diagram, this information will usually be printed on the reverse side of the airport diagram. Separate charts may be included that depict detailed ramp areas and parking positions as well as low visibility taxi routes.

HEADING

Airport, Ramp and Taxiway charts
At the top of page are the location and airport names, the airport's elevation and latitude and longitude, the Jeppesen NavData (ICAO) and IATA identifiers, and the revision date.



1. Jeppesen NavData (ICAO) and IATA identifiers.
2. Airport elevation.
3. Geographic latitude and longitude coordinates in degrees, minutes, and tenths of minutes, representing the location of the airport reference point (ARP) when an ARP symbol is shown. On charts where the ARP is not shown, coordinates represent the airport location as provided by the controlling authority.
4. Revison date.
5. Index (page) number (same as approach chart when the airport is printed on the reverse side of the first approach chart).
6. Geographic location name.
7. Airport name.

COMMUNICATIONS

Communications for departure are listed in order of normal use.

ATIS (ASOS when Twr inop)	ANYTOWN Ground	ACARS: D-ATIS PDC TWIP	Ramp	*Tower CTAF	*ANYTOWN Departure(R) 001°-180°	*ANYTOWN Departure(R) 181°-360°	UNICOM	NAMED Center (R)
127.75 VOT 112.0	121.9		131.97	120.1	126.55	125.5	122.95	120.45 When Dep inop

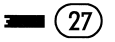
1. VOR test frequency. (Limited) preceding VOT indicates the test signal can only be received at designated positions on the airport.
2. An asterisk (*) indicates part-time operation.
3. Radar is available

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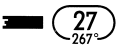
APPROACH CHART LEGEND
AIRPORT PLAN VIEW

SYMBOLS

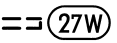
Physical feature symbols used on the airport chart are illustrated below.



Runway number is magnetic unless followed by T for true in the far north.



Runway number and (when known) magnetic direction, unless followed by T for true in the far north.

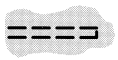


Seaplane operating area, or water runway.


Paved runway


Unpaved runway


Pierced steel planking (PSP)


Seaplane operating area or water runway. Dash lines indicate operating area.

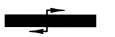

Displaced threshold

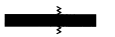

Designated stop bar or designated holding position.


Category II/III holding position.


Approach lights extending to displaced threshold

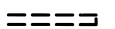

Unidirectional Arrester Gear


Bidirectional Arrester Gear


Jet Barrier


Closed runway. Temporary closed runways will retain length and runway numbers.


Stopway or overrun


Area under construction


Runway shoulder (when readily noticeable)

No differentiation between types of surface for ramps, taxiways, closed runways, closed taxiways, runway shoulders, and areas other than runways. Stopways and overruns are shown regardless of surface, with the length, when known. Stopway and overrun lengths are not included in runway lengths.

ADDITIONAL INFORMATION

Runway end elevations are shown on the airport diagram if source is available.

Approach lights and beacons are the only lighting symbolized on the airport diagram. Approach lights are normally shown to scale in a recognizable form. For approach light symbols see page 121.

A representative selection of reference points known to Jeppesen is depicted. The elevation of reference points depicted is above mean sea level (MSL).

Latitude and longitude ticks at tenths of a minute interval are charted around most planview neatlines.



Taxiway and apron

Permanently closed taxiway


Authorized Landing Area



Helicopter landing pad



Airport Reference Point. Off-runway. Center of cross positioned at exact location.



Airport Reference Point. Located on runway centerline. Arrow points to exact location.



RVR measuring site, may have identifying letter or number.


Airport/Aerodrome/ Identification beacon.



On-airport navaid - VOR, NDB or LCTR (locators, other than locators associated with ILS). Depicted on charts dated on and after 5 FEB 93.


Railroad


Pole line


Lighted Pole


Road


Bluff


Trees

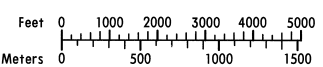

Cone

Tee


Tetrahedron


Buildings


Large building



Bar Scale

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APPROACH CHART LEGEND
ADDITIONAL RUNWAY INFORMATION

ADDITIONAL RUNWAY INFORMATION					
		USABLE LENGTHS — LANDING BEYOND —			
RWY		Threshold	Glide Slope	TAKE-OFF	WIDTH
4R	HIRL CL ALSF-I TDZ grooved RVR				150′
22L	HIRL CL grooved RVR		6641′		
4L	HIRL CL HIALS SFL			NA	150′
22R					
7	❶RL ❶VASI (angle 2.4°)				200′
25					
13	HIRL CL VASI LDIN	11,972′			150′
31	HIRL CL SSALR VASI (non-std) HST-H	11,252′			

❶ Activate on 122.8.

RUNWAY AND APPROACH LIGHTS

For abbreviations used see page 119.

PILOT CONTROLLED AIRPORT LIGHTING SYSTEMS

See "Pilot Controlled Lights (PCL)" in the following sections: INTRODUCTION, Chart Glossary for the United States of America, AIR TRAFFIC CONTROL, Rules and Procedures for the applicable State. Non-standard lighting activations are specified on individual charts.

See ❶ above for charting sample.

USABLE LENGTHS

The usable lengths have been determined as follows in the additional runway information. When usable runway lengths differ from those depicted in the airport planview, lengths are specified in the "USABLE LENGTHS" columns. Blank columns indicate that the runway length depicted in the airport planview is applicable.

LANDING BEYOND

Threshold--When the landing length is restricted, the length shown is the distance beyond the landing threshold to the roll out end of the runway.

Glide Slope--The length shown for ILS is the distance from a point abeam the glide slope transmitter to the roll-out end of the runway. For PAR, the length shown is the distance from the theoretical glide slope interception with the runway to the roll-out end of the runway. If both ILS and PAR are available, data provided is for ILS.

TAKE-OFF

When the take-off length is restricted, the length shown is the distance beyond the point for beginning the take-off roll to the end of the surface usable for take-off.

Stopways, overruns, or clearways are not included in the above figures.

NOTE: An NA charted as Additional Runway Information indicates that take-offs or landings are not authorized for the rwy shown.

LAND AND HOLD SHORT OPERATIONS(LAHSO)

Air Traffic Controllers may authorize operations which include simultaneous take-offs and landings and/or simultaneous landings when a landing aircraft is able and is instructed by the controller to hold-short of the intersecting runway/taxiway or designated hold-short point. The available landing distance is shown in the LAHSO Distance column. On charts dated before 11 JUL 97 the column is titled Threshold to Intersecting Runway.

ADDITIONAL RUNWAY INFORMATION										
						USABLE LENGTHS				
						LANDING BEYOND				
RWY						Threshold	Glide Slope	LAHSO Distance	TAKE-OFF	WIDTH
6	HIRL	MALSR	VASI-L	grooved		7512′		13/31 2400′ 12L/30R 4200′ 12R/30L 2800′		150′
24	HIRL	MALS		grooved	RVR		6452′	13/31 2400′ 12L/30R 3000′ 12R/30L 4500′		

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APPROACH CHART LEGEND

ADDITIONAL RUNWAY INFORMATION		USABLE LENGTHS — LANDING BEYOND —			
RWY		Threshold	Glide Slope	TAKE-OFF	WIDTH
4R	HIRL(60m) CL(15m) ALSF-I TDZ grooved RVR				150′
22L	HIRL(60m) CL(15m) grooved RVR		6641′		
4L	HIRL(60m) CL(15m) HIALS SFL			NA	150′
22R					
7	RL(75m) VASI (angle 2.4°, TCH 10′)				200′
25					
13	HIRL(60m) CL(15m) VASI (non-std) LDIN	11, 972′			150′
31	HIRL(60m) CL(15m) HIALS HSTIL HST-H	11, 252′			

RUNWAY LIGHTS – ABBREVIATIONS

RL — Low Intensity Runway Lights or intensity not specified.

HIRL — High Intensity Runway Edge Lights

Runway edge lights are white, except on instrument runways amber replaces white on the last 2000' or half of the runway length, whichever is less.

MIRL — Medium Intensity Runway Edge Lights

TDZ — Touchdown Zone Lights

HSTIL — High Speed Taxiway turn-off indicator lights.

HST-H — High Speed Taxiway turn-off with green centerline lights. H indicates taxiway identification.

CL — Standard Centerline Light configuration white lights then alternating red & white lights between 3000' and 1000' from runway end and red lights for the last 1000'.

– or –

Exact configuration is not known. Known non-standard configurations are stated as listed below

CL (white) — all lights are white full length of runway.

CL (non-std) — non-standard, configuration unknown

CL (50W, 20R & W, 20R) — non-standard, configuration known...first 5000' white lights; next 2000' alternating red & white lights; last 2000' red lights.

Spacing for Runway Edge Lights and Centerline lights is included as a parenthetical value, at selected locations. The parenthetical value is the spacing in feet or meters as appropriate.

EXAMPLE: HIRL (60m), is High Intensity Runway Edge Lights with a 60 meter spacing. CL (50'), is Centerline Lights with a 50 foot spacing.

APPROACH LIGHTS – ABBREVIATIONS

ALS — Approach Light System. Color of lights, if known to be other than white, is included.

HIALS — High Intensity Approach Light System

HIALS II — High Intensity Approach Light System with CAT II Modifications

MIALS — Medium Intensity Approach Light System

SFL — Sequenced Flashing Lights

F — Condenser-Discharge Sequential Flashing Lights/Sequenced Flashing Lights

ALSF-I — Approach Light System with Sequenced Flashing Lights

ALSF-II — Approach Light System with Sequenced Flashing Lights and Red Side Row Lights the last 1000'. May be operated as SSALR during favorable weather conditions.

SSALF — Simplified Short Approach Light System with Sequenced Flashing Lights

SALSF — Short Approach Light System with Sequenced Flashing Lights

MALSF — Medium Intensity Approach Light System with Sequenced Flashing Lights

RAI — Runway Alignment Indicator

RAIL — Runway Alignment Indicator Lights (Sequenced Flashing Lights which are installed only in combination with other light systems)

REIL — Runway End Identifier Lights (threshold strobe)

RLLS — Runway Lead-in Lighting System

SSALR — Simplified Short Approach Light System with Runway Alignment Indicator Lights

MALSR — Medium Intensity Approach Light System with Runway Alignment Indicator Lights

SALS — Short Approach Light System

SSALS — Simplified Short Approach Light System

MALS — Medium Intensity Approach Light System

LDIN — Sequenced Flashing Lead-in Lights

ODALS — Omni-Directional Approach Light System

VASI — Visual Approach Slope Indicator (L or R indicates left or right side of runway only)

AVASI — Abbreviated Visual Approach Slope Indicator (L or R indicates left or right side of runway only)

SAVASI — Simplified Abbreviated Visual Approach Slope Indicator

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APPROACH CHART LEGEND

VASI (3 bar) — Visual Approach Slope Indicator for high cockpit aircraft (L or R indicates left or right side of runway only).

T-VASI — Tee Visual Approach Slope Indicator.

AT-VASI — Abbreviated Tee Visual Approach Slope Indicator (L or R indicates left or right side of runway only).

VASI (non-std) — Visual Approach Slope Indicator when known to be non-standard.

VASI — VASI/AVASI/NON-STD angels are shown when known to be less than 2.5° or more than 3.0°. T-VASI/AT-VASI angles are shown at all times. VASI (3 bar) descent angles are shown when other than upwind angle 3.25°, downwind angle 3.00°.

APAPI — Abbreviated Precision Approach Path Indicator (L or R indicates left or right side of the runway only)

PAPI — Precision Approach Path Indicator (L or R indicates left or right side of runway only).

PASI — Passive Approach Slope Indicator

PLASI — Pulsating Visual Approach Slope Indicator, normally a single light unit projecting two colors. (L or R indicates left or right side of runway only).

TRCV — Tri-Color Visual Approach Slope Indicator, normally a single light unit projecting three colors. (L or R indicates left or right side of runway only).

TCH — Threshold Crossing Height. Height of the effective visual glide path over the threshold.

MEHT — Minimum Eye Height over Threshold. Lowest height over the threshold of the visual on glide path indication.

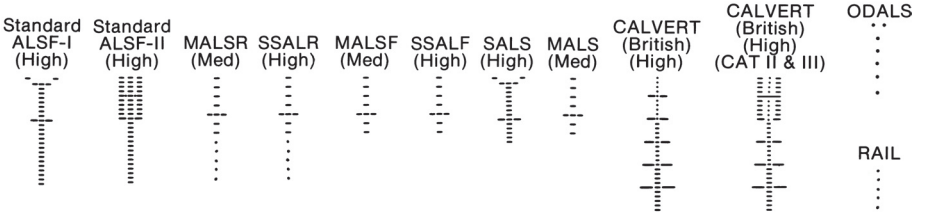
MEHT or TCH is shown (when known) when less than 60' for the upwind bar of a VASI (3 bar) system or less than 25' for all other systems including PAPI.

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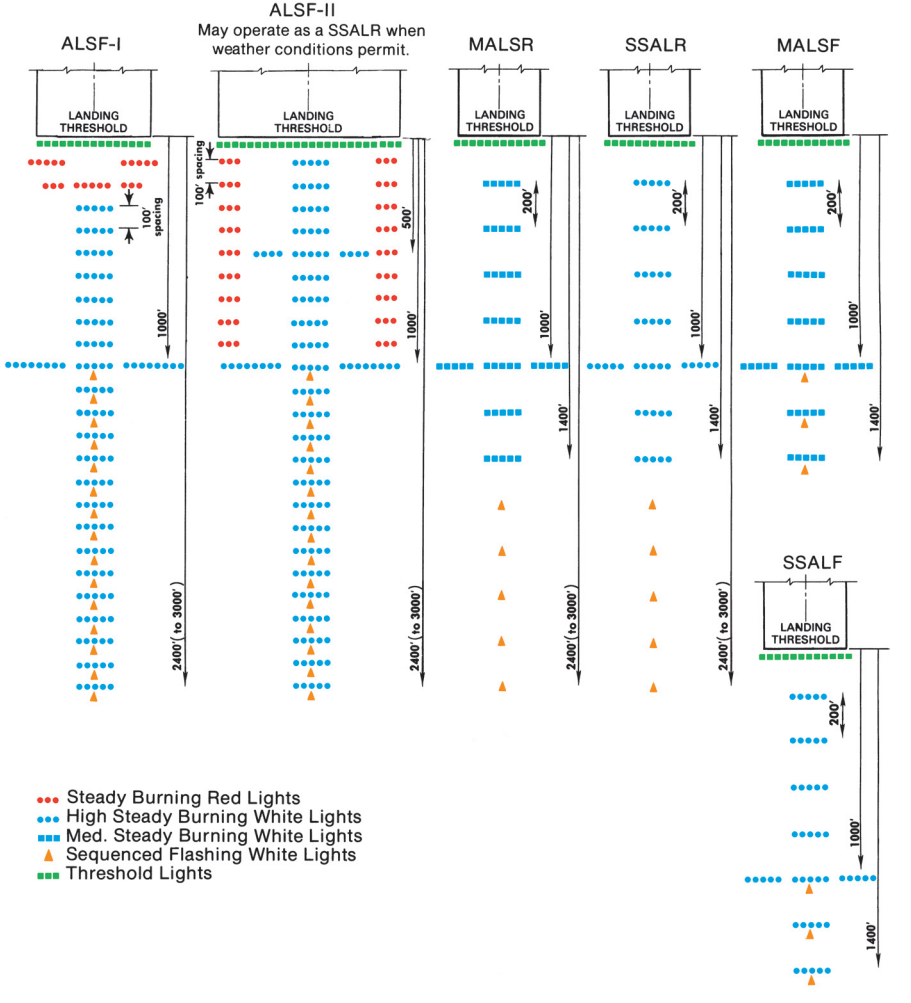
APPROACH CHART LEGEND
LIGHTING SYSTEMS

SHOWN IN AIRPORT PLANVIEW

Approach lights are symbolized in recognizable form, and at the same scale as the airport chart. Typical examples:



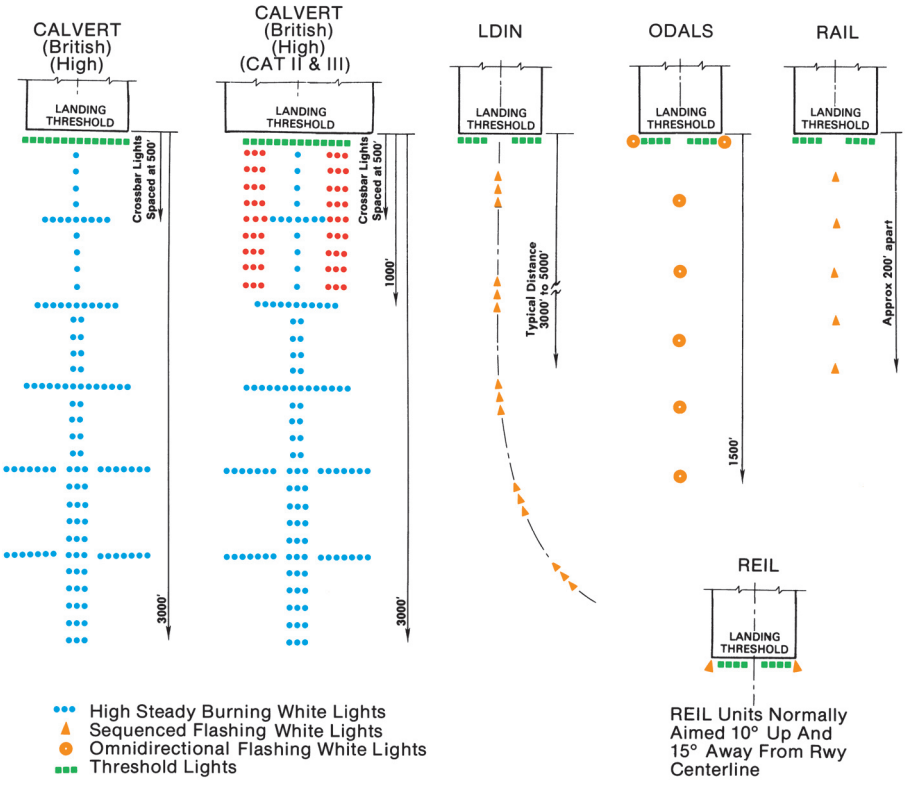
DETAILS



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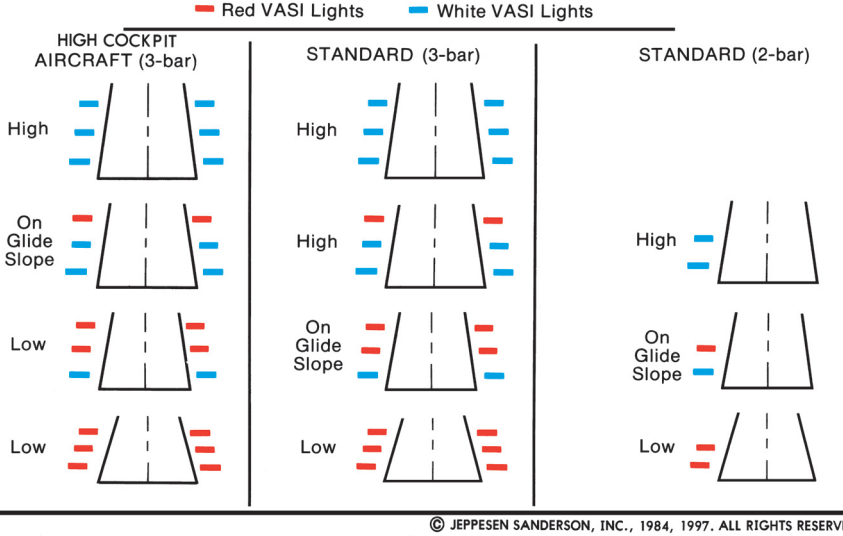
APPROACH CHART LEGEND
LIGHTING SYSTEMS (continued)

DETAILS (Continued)



VISUAL APPROACH SLOPE INDICATOR (VASI)

VASI is normally installed on the LEFT side of the runway. VASI may be installed on the RIGHT side or BOTH sides of the runway.



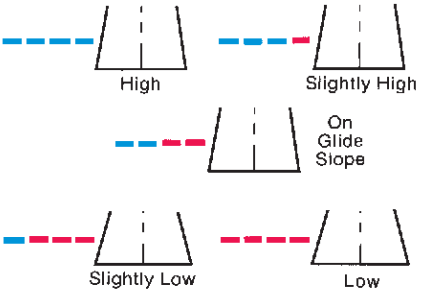
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APPROACH CHART LEGEND
LIGHTING SYSTEMS (continued)

PRECISION APPROACH PATH INDICATOR (PAPI)

PAPI is normally installed on the LEFT side of the runway.

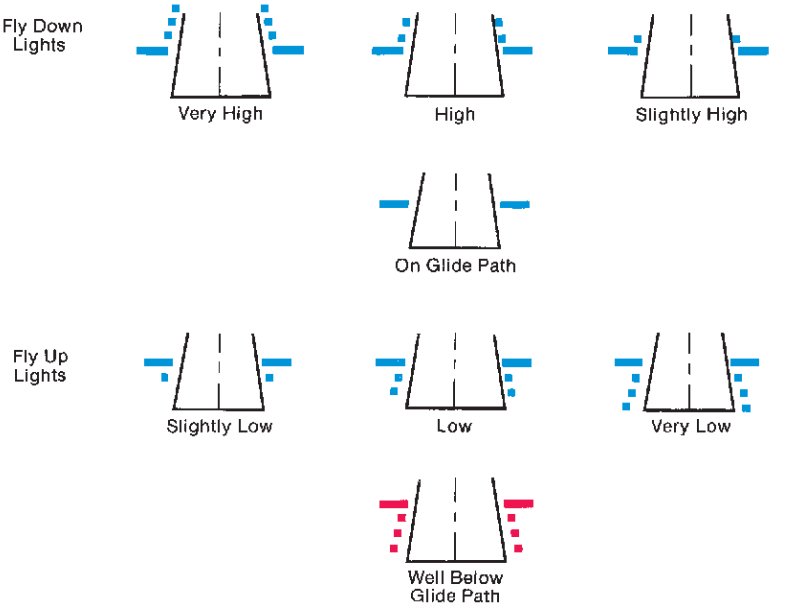
Red PAPI Lights White PAPI Lights



VISUAL APPROACH SLOPE INDICATOR (T-VASI)

T-VASI may be installed on the LEFT, RIGHT or BOTH sides of the runway.

Red T-VASI Lights White T-VASI Lights



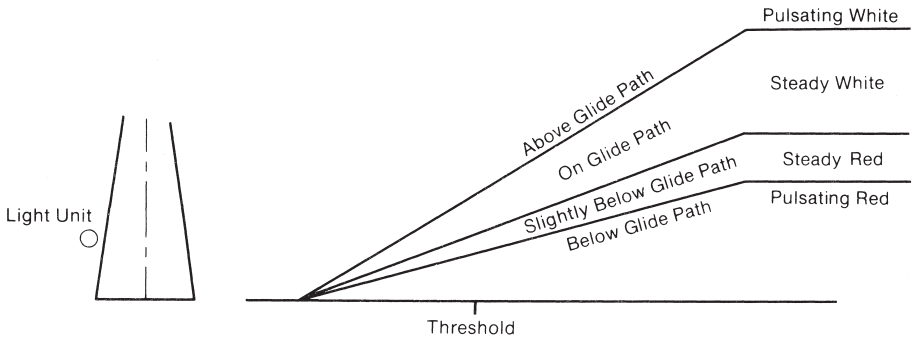
For a 3.00° glide slope the nominal eye height over the runway threshold is 49'(15m). If an increase in eye height over the runway threshold is required to provide adequate wheel clearance, then the approach may be flown with one or more fly down lights visible.

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APPROACH CHART LEGEND
LIGHTING SYSTEMS (continued)

PULSATING VISUAL APPROACH SLOPE INDICATOR (PLASI)

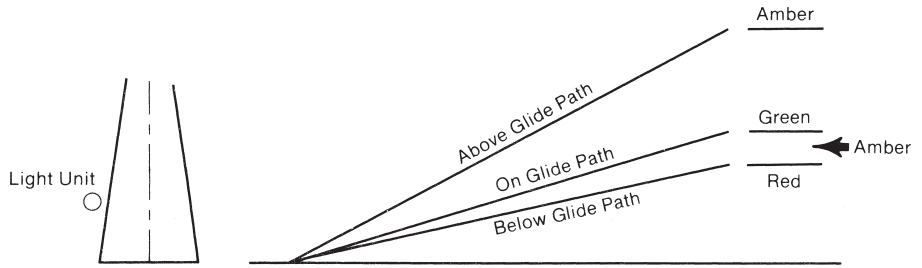
PLASI is normally a single light unit located on the LEFT side of the runway.



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

TRI-COLOR VISUAL APPROACH SLOPE INDICATOR (TRCV)

TRCV is normally a single light unit located on the LEFT side of the runway.



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

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APPROACH CHART LEGEND
TAKE-OFF AND ALTERNATE MINIMUMS

Publication of minimums does not constitute authority for their use by all operators. Each individual operator must obtain appropriate approval for their use.

On all formats, when the take-off minimums are specified in terms of ceiling and visibility, *BOTH* must be reported by the responsible ground unit.

TAKE-OFF MINIMUMS, USA CHARTS

Standard Take-off Minimums in the USA: The standard take-off minimums is RVR 50 or 1 for 1 & 2 Eng. aircraft and RVR 24 or ½ for 3 & 4 Eng. aircraft.

Runway Visual Range (RVR) is to be used instead of reported visibility for operating on any runway for which RVR is reported.

At some airports, obstructions or other factors require the establishment of higher than standard take-off minimums and/or obstacle departure procedures to assist pilots during the IFR climbout to the minimum enroute altitude or cruising altitude.

Take-off restrictions, including ceiling and visibility requirements, and obstacle departure procedures, apply to FAR 121, 129 and 135 operators.

FAR 129 prescribes rules governing the operations of foreign air carriers within the USA.

A. *Lower-than-Standard Take-off Minimums:* On runways where standard minimums are authorized, and lower-than-standard minimums are not denied, the following minimums are also authorized for operators under FAR Part 121, and 129. Such minimums may be authorized for those FAR 135 operators, having specific authorization in their Operations Specifications.

The Lower-than-Standard Minimums are:

Visibility or RVV ¼ statute mile or Touchdown Zone RVR 16, provided at least one of the following visual aids is available. The Touchdown Zone RVR report, if available, is controlling. The Mid RVR report may be substituted for the Touchdown Zone RVR report if the Touchdown Zone RVR report is not available.

(1) Operative high intensity runway lights (HIRL)

(2) Operative runway centerline lights (CL).

(3) Runway centerline marking (RCLM).

(4) In circumstances when none of the above visual aids are available, visibility or RVV ¼ statute mile may still be used, provided other runway markings or runway lighting provide pilots with adequate visual reference to continuously identify the take-off surface and maintain directional control throughout the take-off run.

B. Touchdown Zone RVR 10 (beginning of take-off run) and Rollout RVR 10, provided all of the following visual aids and RVR equipment are available. The Mid RVR may be substituted for the Touchdown Zone RVR report if the Touchdown Zone RVR report is not available.

(1) Operative runway centerline lights (CL).

(2) Two operative RVR reporting systems serving the runway to be used, both of which are required and controlling. A Mid RVR report may be substituted for either a Touchdown Zone RVR report if a Touchdown Zone report is not available or a Rollout RVR report if a Rollout RVR report is not available.

C. Touchdown Zone RVR 5 (beginning of take-off run), Mid RVR 5 and Rollout RVR 5, provided all of the following visual aids and RVR equipment are available.

(1) Operative runway centerline lights (CL).

(2) Runway centerline markings (RCLM).

(3) Operative Touchdown Zone and Rollout RVR reporting systems serving the runway to be used, both of which are controlling, or three RVR reporting systems serving the runway to be used, all of which are controlling. However, if one of the three RVR reporting systems has failed, a take-off is authorized, provided the remaining two RVR values are at or above the appropriate take-off minimums.

D. Take-off Guidance System, if applicable.

Touchdown Zone RVR 3 (beginning of take-off run), Mid RVR 3 and Rollout RVR 3, provided all the following aids are available. Operative Touchdown Zone RVR and Rollout RVR reporting systems serving the runway to be used, both of which are controlling, or three RVR reporting systems serving the runway to be used, all of which are controlling. However if one of the three RVR reporting systems has failed, a take-off is authorized, provided the remaining two RVR values are at or above the appropriate take-off minimums.

(1) Operative high intensity runway lights (HIRL)

(2) Operative runway centerline lights (CL).

(3) Serviceable runway centerline markings (RCLM).

(4) Front course guidance from the localizer must be available and used (if applicable to guidance system used).

(5) The reported crosswind component shall not exceed 10 knots.

(6) The pilot in command and the second in command have completed the certificate holders approved training program for these operations.

(7) All operations using these minimums shall be conducted to runways which provide direct access to taxiway routing which are equipped with operative taxiway centerline lighting which meets U.S. or ICAO criteria for CAT III operations; or other taxiway guidance systems approved for these operations.

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APPROACH CHART LEGEND
TAKE-OFF AND ALTERNATE MINIMUMS (continued)

USA FORMAT

The title TAKE-OFF & OBSTACLE DEPARTURE PROCEDURE is used to indicate that both take-off minimums and obstacle departure procedures are specified. In such cases, refer to the note OBSTACLE DP to the left and immediately below the minimum columns for the procedure.

"Adequate Vis Ref" is shown as a reminder that at least one of the following visual aids must be available. The Touchdown Zone RVR report, if available, is controlling. The Mid RVR report may be substituted for the Touchdown Zone RVR report if the Touchdown Zone RVR is not available.
(1) Operative high intensity runway lights (HIRL).
(2) Operative runway centerline lights (CL).
(3) Runway centerline marking (RCLM).
(4) In circumstances when none of the above visual aids are available, visibility or RVV ¼ statute mile may still be used, provided other runway markings or runway lighting provide pilots *with adequate visual reference* to continuously identify the take-off surface and maintain directional control throughout the take-off run.

STD denotes standard take-off minimums for FAR 121, 123, 125, 129 and 135 operators. Standard is RVR 50 or 1 for 1 & 2 Eng. RVR 24 or ½ for 3 & 4 Eng.

The Obstacle DP for runways 29L/R require (when the weather is below 1000′ ceiling-7 miles) a climb to 1800′ MSL on runway heading before initiating a turn.

Applicable to FAR 121 and 129 operators. Applicable to FAR 135 operators having specific authorization in their operations specifications.

Operative Touchdown Zone and Rollout RVR reporting systems serving the runway to be used, both of which are controlling, or three RVR reporting systems serving the runway to be used, all of which are controlling. However, if one of the three RVR reporting systems has failed, a take-off is authorized provided the remaining two RVR values are at or above the appropriate take-off minimums.

To be eligible for the minimum shown in the columns below, a climb gradient of at least 290′/NM is required until reaching 1000′ MSL.

If unable to meet climb requirement, 300′ ceiling-RVR 50 or 1 mile apply.

Restrictions in this column, if any, apply to all operators.

Approaches with electronic glide slope.

LOC, VOR, etc. approaches.

TAKE-OFF & OBSTACLE DEPARTURE PROCEDURE								FOR FILING AS ALTERNATE	
Rwys 11R, 29L					Rwys 4, 11L, 22, 29R				
(Rwy 11R) Approved Guidance System Required CL & RCLM any RVR out, other two required	CL & RCLM any RVR out, other two req.	Adequate Vis Ref	STD	With M/m climb of 290′/NM to 1000′		Other	Precision	Non-Precision
				Adequate Vis Ref	STD			
1 & 2 Eng: TDZ RVR 3 / Mid RVR 3 / Rollout RVR 3	TDZ RVR 5 / Mid RVR 5 / Rollout RVR 5	RVR 16 or ¼	RVR 50 or 1 / RVR 24 or ½	RVR 16 or ¼	RVR 50 or 1 / RVR 24 or ½	300-RVR 50 or 1	A, B, C: 600-2 / D: 700-2	800-2
3 & 4 Eng: TDZ RVR 3 / Mid RVR 3 / Rollout RVR 3	TDZ RVR 5 / Mid RVR 5 / Rollout RVR 5	RVR 16 or ¼	RVR 50 or 1 / RVR 24 or ½	RVR 16 or ¼	RVR 50 or 1 / RVR 24 or ½	300-RVR 50 or 1	A, B, C: 600-2 / D: 700-2	800-2

OBSTACLE DP: Rwys 29L & 29R when weather is below 1000-7 northbound departures (296° clockwise 116°) climb rwy heading to 1800′ before turning.

Figures shown with RVR (runway visual range) represent readings in hundreds of feet. The figures without the RVR prefix represent visibility in statute miles or fractions thereof. For example: RVR 50 or 1 means 5000 feet RVR or one statute mile visibility; RVR 24 or ½ means 2400 feet RVR or one-half statute mile visibility.

Individual runway columns are shown whenever minimums are not the same for all runways The best opportunity runway is shown at the far left. Within each runway column, all conditions are specified, and minimums are positioned in ascending order, left to right. Columns are not established solely to identify runways with and without RVR when all other conditions are the same.

Altitudes listed in climb gradient requirements or for obstacle departure procedures are above Mean Sea Level (MSL). Ceiling specified for Take-off minimums or Alternate minimums are heights Above Airport Level (AAL).

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APPROACH CHART LEGEND
TAKE-OFF AND ALTERNATE MINIMUMS (continued)

TAKE-OFF MINIMUMS, WORLDWIDE CHARTS

Publication of minimums does not constitute authority for their use by all operators. Each individual operator must obtain appropriate approval for their use.

On all formats, when the take-off minimums are specified in terms of ceiling and visibility, both values must be reported by the responsible ground unit.

The take-off minimums published under the title AIR CARRIER are based on Joint Aviation Regulation Operations Subpart E. On charts dated prior to 12 Nov 99, the take-off minimums are published based on ICAO/ECAC guidance material supported by adopted practice.

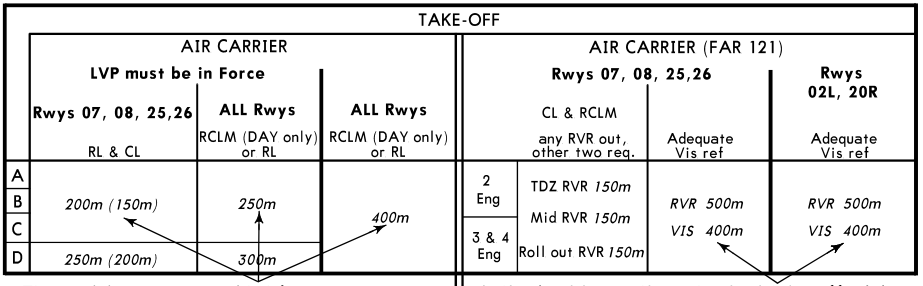
Take-off minimums published under the title AIR CARRIER (FAR 121) are based on U.S. Operations Specifications.

The application of these take-off minimums may be limited by the obstacle environment in the take-off and departure area. The RVR/VIS minimums are determined to ensure the visual guidance of the aircraft during the take-off run phase. The subsequent clearance of obstacles is the responsibility of the operator.

RVR and visiblity values are shown in measuring units as reported by the governing agency.

The title TAKE-OFF & DEPARTURE PROCEDURE is used to indicate that both take-off minimums and departure procedures are specified. In such cases, refer to the note DEPARTURE PROCEDURE to the left and immediately below the minimum colums for the procedure.

WORLDWIDE FORMAT FOR NON-FAA OR JAA MEMBER STATES ON CHARTS DATED ON OR AFTER 11 MAY 01.



These minimums are provided for operators not applying take-off minimums as specified under Air Carrier (FAR 121). RVR/VIS in parentheses apply only if TDZ RVR is supplemented by RVR reports at mid runway and/or roll-out end. The TDZ RVR can be determined by the pilot from the take-off position and is considered for the application of these minimums. Therefore, RVR/VIS minimums appropriate to TDZ RVR may be charted, even though the RVR may not be installed. Take-off minimums without specific runway centerline markings (day only) should be at least 500m.
A Low Visibility Take-off with RVR/VIS below 400m requires the verification that Low Visibility Procedures (LVPs) have been established and are in force (all CAT II/III approved aerodromes).
The following guidance has been established for aerodromes not approved for CAT II/III operations.

Until such time that the concept for LVPs is also established for such aerodromes, the commander must satisfy himself with Air Traffic Services, or the Aerodrome Operator, that for a Low Visibility Take-off only one aircraft at a time is on the maneuvering area, and that vehicle traffic on the maneuvering area is controlled and restricted to the absolute minimum.

Authorized lower-than-standard take-off minimums of RVR *500m* VIS *400m* must be increased to the standard RVR *1500m* or VIS *1600m* for 1 & 2 eng. aircraft and to RVR *720m* or VIS *800m* for 3 & 4 eng. aircraft, unless one of the following visual aids is available.

"Adequate Vis Ref" is shown as a reminder that at least one of the following visual aids must be available. The Touchdown Zone RVR report, if available, is controlling. The Mid RVR report may be substituted for the Touchdown Zone RVR report if the Touchdown Zone RVR report is not available.

(1) Operative high intensity runway lights (HIRL).
(2) Operative runway centerline lights (CL).
(3) Runway centerline marking (RCLM).
(4) In circumstances when none of the above visual aids are available, 400m visibility [RVR 500m Vis 400m (RVR 16 or ¼)] may still be used, provided other runway markings or runway lighting provide pilots *with adequate visual reference* to continuously identify the take-off surface and maintain directional control throughout the take-off run.

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APPROACH CHART LEGEND
TAKE-OFF AND ALTERNATE MINIMUMS (continued)
ALTERNATE MINIMUMS

ALTERNATE minimums will be charted only for individual airports when specified by the country. Charted minimums are those specified by the country. The USA Operations Specifications require the operator to calculate alternate minimums. The following is a condensed version of the applicable Operations Specifications.

MINIMUMS FOR FILING AS ALTERNATE

When USA Operations Specifications are binding, the certificate holder is authorized to derive alternate airport weather minimums from the following table. In no case shall the certificate holder use an alternate airport weather minimum lower than any applicable minimum derived from this table. In determining alternate airport weather minimums, the certificate holder shall not use any airport which is not authorized for use as an Alternate Airport.

APPROACH FACILITY CONFIGURATION	Alternate Airport IFR Weather Minimums	
	Ceiling	Visiblility
For airports with at least one operational navigational facility providing a straight-in nonprecision approach procedure, or Category 1 precision approach, or, when applicable, a circling maneuver from an instrument approach procedure.	**Add 400 ft** to the MDH or DH as applicable.	**Add 1 SM or 1600m** to the landing minimum.
For airports with at least two operational navigational facilities, each providing a straight-in approach procedure to different, *suitable runways. For an ER-OPS Enroute Alternate Airport these operations specifications apply for **separate** *suitable runways.	**Add 200 ft** to the higher DH or MDH of the two approaches used.	**Add ½SM or 800m** to the higher authorized landing minimum of the two approaches used.

*In this context, a "different" runway is any runway with a different runway number, whereas "separate" runways cannot be opposite ends of the same runway.

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APPROACH CHART LEGEND
TAKE-OFF AND ALTERNATE MINIMUMS (continued)

U.S. FAR PART 121 AND 135 OPERATIONS SPECIFICATIONS ALTERNATE AIRPORT MINIMUMS TABLES

USE OF TABLES

To determine your alternate minimums, review the landing minimums on the available approaches at the selected alternate. Determine which navaid table applies. Enter the applicable table on the following page with the landing HAT/HAA, and extract your alternate ceiling and visibility:

"ONE - NAVAID TABLE" should be used for the following approach facility configuration:
For airports with at least one operational navigational facility providing a straight-in non-precision approach procedure, or a straight-in precision approach procedure, or, when applicable, a circling maneuver from an instrument approach procedure.

"TWO - NAVAID TABLE" should be used for the following approach facility configuration:
For airports with at least two operational navigational facilities, each providing a straight-in non-precision approach procedure or a straight-in precision approach procedure to *different, suitable runways*. (However, when an airport is designated as an ER-OPS Enroute Alternate Airport in your Operations Specifications, the approach procedures used must be to *separate, suitable runways*.)

Comply with Operations Specifications. For foreign procedures, if Operations Specifications permit alternate minimums lower than specified by the host government, obtain host government approval prior to their use.

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APPROACH CHART LEGEND
TAKE-OFF AND ALTERNATE MINIMUMS (continued)

U.S. FAR PART 121 AND 135 OPERATIONS SPECIFICATIONS
ALTERNATE AIRPORT MINIMUMS TABLES

ONE-NAVAID TABLE

CHARTED HAT/HAA	ALTERNATE CEILING	CHARTED VIS	ALTERNATE VIS	METRIC CHARTED VIS	METRIC ALTERNATE VIS
200	600	1/2	1 1/2	*800 M*	*2.4 Km*
201-300	700	3/4	1 3/4	*1200 M, 1.2 Km*	*2.8 Km*
301-400	800	1	2	*1600 M, 1.6 Km*	*3.2 Km*
401-500	900	1 1/4	2 1/4	*2000 M, 2.0 Km*	*3.6 Km*
501-600	1000	1 1/2	2 1/2	*2.4 Km*	*4.0 Km*
601-700	1100	1 3/4	2 3/4	*2.8 Km*	*4.4 Km*
701-800	1200	2	3	*3.2 Km*	*4.8 Km*
801-900	1300	2 1/4	3 1/4	*3.6 Km*	*5.2 Km*
901-1000	1400	2 1/2	3 1/2	*4.0 Km*	*5.6 Km*
		2 3/4	3 3/4	*4.4 Km*	*6.0 Km*
		3	4	*4.8 Km*	*6.4 Km*

TWO-NAVAID TABLE

CHARTED HAT	ALTERNATE CEILING	CHARTED VIS	ALTERNATE VIS	METRIC CHARTED VIS	METRIC ALTERNATE VIS
200	400	1/2	1	*800 M*	*1.6 Km*
201-300	500	3/4	1 1/4	*1200 M, 1.2 Km*	*2.0 Km*
301-400	600	1	1 1/2	*1600 M, 1.6 Km*	*2.4 Km*
401-500	700	1 1/4	1 3/4	*2000 M, 2.0 Km*	*2.8 Km*
501-600	800	1 1/2	2	*2.4 Km*	*3.2 Km*
601-700	900	1 3/4	2 1/4	*2.8 Km*	*3.6 Km*
701-800	1000	2	2 1/2	*3.2 Km*	*4.0 Km*
801-900	1100	2 1/4	2 3/4	*3.6 Km*	*4.4 Km*
901-1000	1200	2 1/2	3	*4.0 Km*	*4.8 Km*
		2 3/4	3 1/4	*4.4 Km*	*5.2 Km*
		3	3 1/2	*4.8 Km*	*5.6 Km*

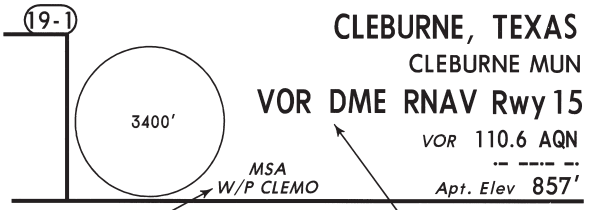
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VOR DME RNAV APPROACH CHART LEGEND

This legend applies to instrument approach procedures based on airborne area navigation (RNAV) systems dependent upon VOR DME or VORTAC facilities and supplement the approach chart legend beginning on introduction page 101.

See Introduction page 133 for LORAN RNAV approach procedures.

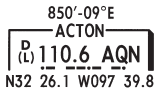
HEADING



MSA is predicated upon a VOR DME waypoint.

As the FAA reissues these RNAV procedures, the prefix "VOR DME" is added to indicate the procedure is dependent upon use of VOR DME or VORTAC facilities.

PLAN VIEW



Primary VORTAC or VOR DME facility used to form waypoints. MSL elevation of DME transmitter, station declination, and coordinates are included in the facility box.



Waypoint. The label includes the waypoint name; the identifier of the forming navaid; and the bearing (Theta) and distance (Rho) from the forming navaid.



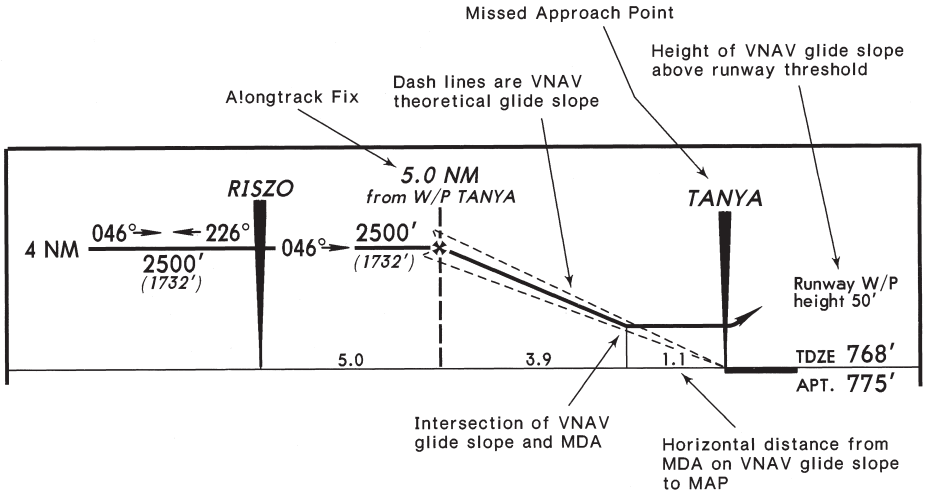
A waypoint may be located at a VORTAC or VOR DME.



Alongtrack Distance (ATD) fix. This ATD fix is an alongtrack position defined as a distance in NM, with reference to the next waypoint.

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PROFILE VIEW



CONVERSION TABLE

Gnd speed-Kts	70	90	100	120	140	160
GS Setting 3.17°	398	512	569	683	797	911
MAP at W/P TANYA						

Missed Approach Point

VNAV glide slope setting

Rates of descent on VNAV glide slope

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CHARTED VISUAL FLIGHT PROCEDURES

CVFPs (USA ONLY)

Charted Visual Flight Procedures (CVFP's) are established at locations with jet operations for noise abatement purposes. These procedures require radar monitoring and an operational air traffic control tower.

CVFPs originate at or near prominent landmarks. When landmarks are not visible at night, the approach will be noted as "Not Authorized at Night".

CVFPs usually originate not more than 15 flying miles from the airport. Charted course information between landmarks along the flight track is provided for general orientation only. Navaids are provided for supplementary information only.

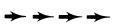
Recommended altitudes are charted as "RECOMMENDED" and are for noise abatement purposes. Pilots are not prohibited from flying other than recommended altitudes if operational requirements dictate.

Air Traffic ControL (ATC) will not issue a clearance for a CVFP when weather is less than published minimums. Published minimums on CVFPs are based on minimum vectoring altitudes.

ATC will clear aircraft for a CVFP after the pilot reports sighting charted landmarks or a preceding aircraft. When instructed to follow a preceding aircraft, pilots are responsible for maintaining a safe approach interval and wake turbulence separation. Advise ATC if unable to continue the approach. Since CVFPs are visual procedures, a missed approach is a normal go-around.

CVFPs are designed for visual operations. They depict only those visual check points deemed significant by the originating authority. They do not depict all obstacles that may be encountered below reasonable and safe altitudes.

The plan view is a graphic picture of the approach presented to scale. Symbols common to CVFPs are shown below.



Visual flight track

RECOMMENDED 2300'

Recommended altitudes are labeled "RECOMMENDED"

2300'

All altitudes are "MINIMUM" altitudes unless specifically labeled otherwise. Altitudes are above mean sea level.

2300 TCA

Altitude designated to indicate the floor of the Terminal Control Area when applicable.

MANDATORY 2300'

Mandatory altitudes are labeled "MANDATORY" and apply at the fix or point.

MAXIMUM 2300'

Maximum altitudes are labeled "MAXIMUM"



Airport to which the approach is designated



Other nearby airports

Sky Park



City or heavily built up area

Railroads

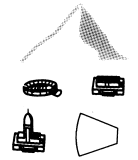


Highway

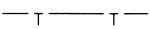
Rivers



Lakes or large water area



Landmarks used as visual aids during the approach. Each symbol is tailored to represent the specific landmark used in the procedure.



Power and Pole line.

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APPROACH CHART LEGEND
GPS APPROACH CHARTS

This GPS Approach Chart Legend supplements the standard approach chart legend beginning on Introduction Page 101. Equipment requirements, database requirements, and requirement or non-requirement for monitoring conventional navaids are not addressed in this legend-Refer to Jeppesen Air Traffic Control (ATC) pages for this information. [For the United States, refer to the Jeppesen Navigation Aids pages of the Airman's Information Manual.]

STAND ALONE GPS APPROACH. Procedure is included in Jeppesen's NavData Service.

FREDERICK, MD
FREDERICK MUN
GPS Rwy 5
KFDK Apt. Elev **304'**

GPS APPROACH, overlies an established conventional navigation non-precision approach. Procedure is included in Jeppesen's NavData Service.

OAKLEY, KAN
OAKLEY MUN
NDB or GPS Rwy 34
NDB **380 OEL**
KOEL Apt. Elev **3044'**

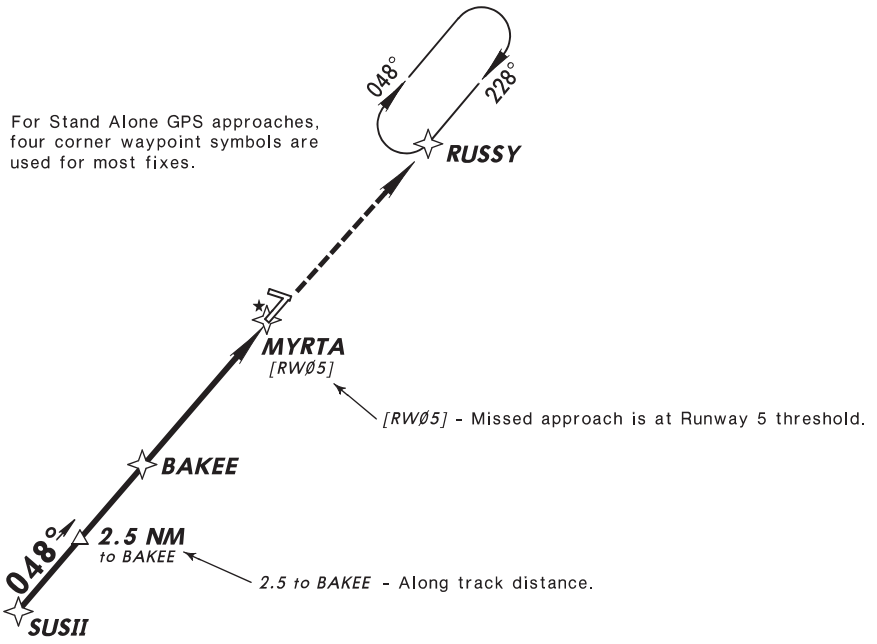
Airport identifier to assist in selecting the appropriate airport information from the database.

GPS OVERLAY, overlies an established conventional navigation non-precision approach. Note that GPS is not part of instrument approach procedure title. *(GPS)* indicates GPS approach information has been applied to the approach chart. Procedure is included in Jeppesen's NavData Service.

GENEVA, SWITZERLAND
COINTRIN
GVA VORDME Rwy 23
(GPS) VOR **114.6 GVA**
LSGG Apt. Elev **1411'**

Airport identifier to assist in selecting the appropriate airport information from the database.

Jeppesen database identifiers are always shown in italic type. They are enclosed within square brackets, as [D255G], or prior to October 1994 within parentheses, as (D255G).

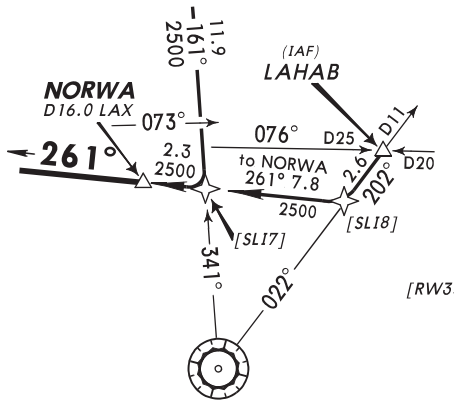


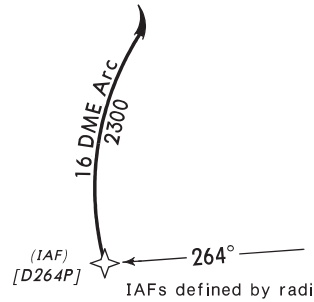
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APPROACH CHART LEGEND
GPS APPROACH CHARTS (continued)

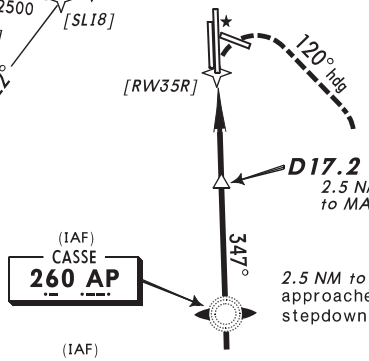
For "NDB or GPS" type approaches and for GPS overlays, waypoint symbol is used mostly for fixes that would otherwise be shown as position fixes with no triangle fix symbol or for added database fixes not part of the conventional non-precision navigation approach.

Turn points where headings or courses intersect courses between IAF and FAF.

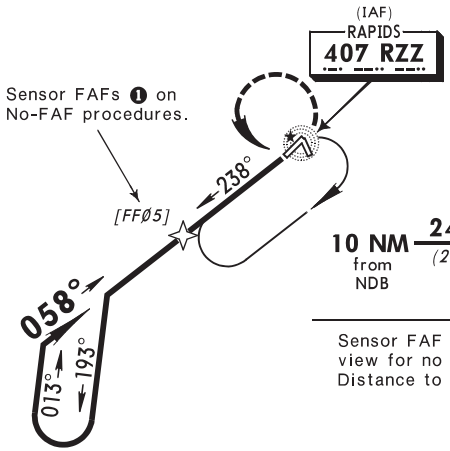


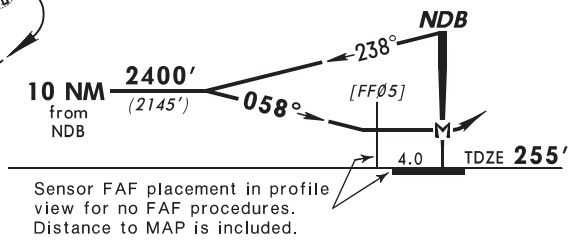


IAFs defined by radials on DME arc procedures.



2.5 NM to MAP - For timed approaches, distance from stepdown fix to MAP is included.





Sensor FAF placement in profile view for no FAF procedures. Distance to MAP is included.

❶ Definition: A Sensor FAF is a final approach waypoint created and added to the database sequence of waypoints to support GPS navigation of a published, no FAF, non-precision approach. The Sensor FAF is included in Jeppesen's NavData waypoint sequence and included in the plan and profile views of no FAF non-precision approach charts. In some cases, a step down fix, recognized by a charted database identifier, may serve as the Sensor FAF.

AIRSPACE FIXES

- △ ✧ × - Non-Compulsory Airspace fixes.
- ▲ ✦ - Compulsory Airspace fixes.
- △ ▲ ✦ ✧ × - Fly-over Airspace fixes.

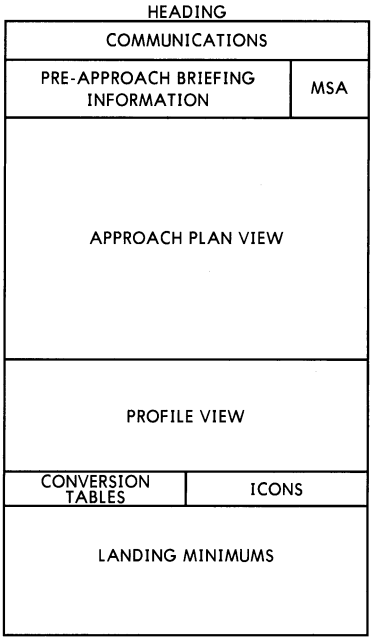
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APPROACH CHART LEGEND NEW FORMAT
(BRIEFING STRIP CONCEPT)
Effective 19 September 1997

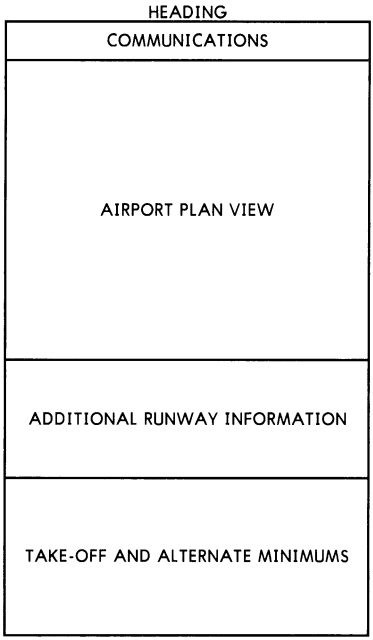
Approach charts are graphic representations of instrument approach procedures prescribed by the governing authority. The following pages briefly explain the symbols used on these charts. Not all items apply to all charts.

GENERAL FORMAT

APPROACH CHART FORMAT



AIRPORT CHART FORMAT



IMPORTANT NOTE

Legend pages titled "NEW FORMAT" contain information specific to charts formatted in the briefing strip concept. These legend pages include only the items that are unique to the New Format. For information not covered in the "NEW FORMAT" legend, refer to the regular "APPROACH CHART LEGEND" pages in the Airway Manual.

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APPROACH CHART HEADING



Approach chart heading information consists of the following:

❶ Jeppesen NavData (ICAO) identifier.

❷ Airport name.

❸ Index number. Charts are sequenced by runway number within a similar type.

❹ Location name.

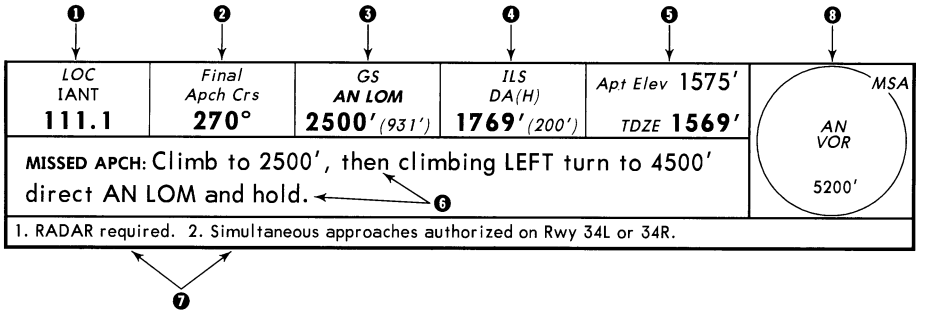
❺ Procedure identification.

COMMUNICATIONS

Communications for arrival use are listed in the order of normal use.

ATIS Arrival	ANYTOWN Approach (R)	ANYTOWN Tower	Ground
125.6	119.3	118.1	121.9

PRE-APPROACH BRIEFING INFORMATION



Information for the pre-approach briefing is listed in the following sequence:

❶ Primary Navaid frequency and identifier.

❷ Final Approach Course.

❸ Glide slope altitude at OM for precision approaches, Minimum altitude at the Final Approach Fix (or equivalent) for non-precision approaches.

❹ Lowest DA(H) or MDA(H).

❺ Airport Elevation and TouchDown Zone/Threshold Elevation.

❻ Missed Approach instructions.

❼ Notes applicable to the approach procedure. Notes may include:

Altimeter setting information.

Transition Altitude and Level.

Barometric Pressure Equivalent for QFE altimeter setting.

Equipment/crew requirements for the approach.

Informational or descriptive notes applicable to the procedure.

The Note box may be omitted when there are no applicable notes.

❽ Minimum Safe or Sector altitude (MSA). Altitudes are protected to a 25 nautical mile radius unless specified otherwise.

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APPROACH CHART PLAN VIEW

NAVAIDS

ILS, LOC, LDA, SDF or MLS

LOC Back Course

OFFSET LOC

Offset Localizer

Marker

Marker with Locator or NDB

Marker with co-located intersection or DME fix

NAVAID INFORMATION BOXES

Navaid information boxes contain the Navaid name, identifier, frequency and Morse code.

ANYTOWN
117.9 ANY

Shadowed box indicates the primary Navaid for the approach.

ANYTOWN
D 117.9 ANY

"D" indicates DME capability.

BEARINGS

090° Magnetic course

090°T True course

ANY 117.9 105°

AN 356 260°

VOR Radials forming a position or fix. VOR Radials are bearing from the Navaid, NDB bearing are to the Navaid.

AIRPORTS

Civil or Joint use Airport

Airport with rotating beacon

Military Airport

Heliport

Seaplane Base

Closed Airport

SPECIAL USE AIRSPACE

R-2402 Restricted Area

P-23 Prohibited Area

PROFILE VIEW

PROFILE SYMBOLS

VOR, NDB, or Waypoint.

BUM

Fan Marker with name/ code.

Fan Marker and NDB co-located.

ANNIE
D10.0

Fix with name or DME distance.

PROFILE ALTITUDES

All altitudes in the profile view are minimum altitudes above mean sea level, unless otherwise specified.

5200′	Minimum Altitude (MIM).
MANDATORY 5200′	Mandatory altitude at specified position or fix.
MAXIMUM 5200′	Maximum altitude (MAX) at specified position or fix.
RECOMMENDED 5200′	Recommended altitude.
(4169′)	Height above airport, runway end, or touchdown zone.

Altitudes in the profile will be in **Bold** type when the altitude is at the:
- FAF on non-precision approaches
- ILS Glide Slope Intercept altitude
- ILS Glide Slope altitude at the outer marker

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CONVERSION TABLES
LIGHTING BOX AND MISSED APPROACH ICONS

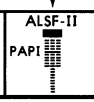
CONVERSION TABLE

Conversion tables, Lighting Box and Missed Approach Icons are located below the profile view.

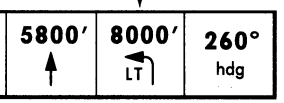
CONVERSION TABLE

Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	377	484	538	645	753	861
LOM to MAP	5.1	4:22	3:24	3:04	2:33	2:11	1:55

LIGHTING BOX



MISSED APPROACH ICONS



ILS Glide Slope Angle with rate of descent at various speeds.

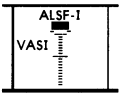
Non-Precision Approach missed approach point with time-to-go as applicable.

Vertical Navigation (VNAV) descent angle with rate of descent for various speeds.

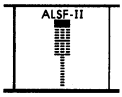
Gnd speed-Kts	70	90	100	120	140	160
Descent angle [3.00°]	372	478	531	637	743	849
MAP at NDB						

LIGHTING BOX

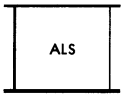
The lighting box displays the approach lights (ALS), visual approach slope lighting (VASI or PAPI), and runway end lights (REIL) for the straight-in landing runway. The lighting box is omitted when ALS, VASI, PAPI or REIL not installed.



Approach lights and VASI. (VASI and PAPI are depicted in their relative position; Left, Right or Both sides of centerline).



Approach lights.



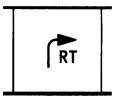
Approach lights. (Configuration unknown)



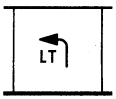
REIL and VASI.

MISSED APPROACH ICONS

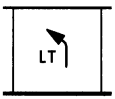
Missed Approach Icons include a wide variety of initial action instructions. A representative sample of Icons are shown below;



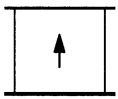
Right Turn (greater than 45°)



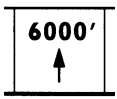
Left Turn (greater than 45°)



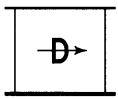
Left Turn (less than 45°)



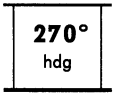
Climb



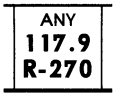
Climb to altitude



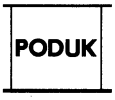
Direct



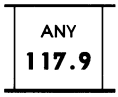
Fly Heading



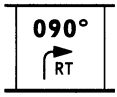
Track Radial



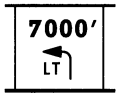
To specified Fix



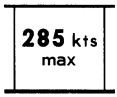
To specified Navaid



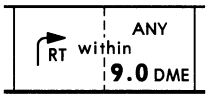
Turn to specified Course



Turn to specified Altitude



Airspeed limit



Right turn with Limit

NOTE: Missed Approach Icons provide for initial actions only. Always refer to the Missed Approach instructions in the PRE-APPROACH BRIEFING section and the plan view for complete instructions.

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VERTICAL NAVIGATION (VNAV)

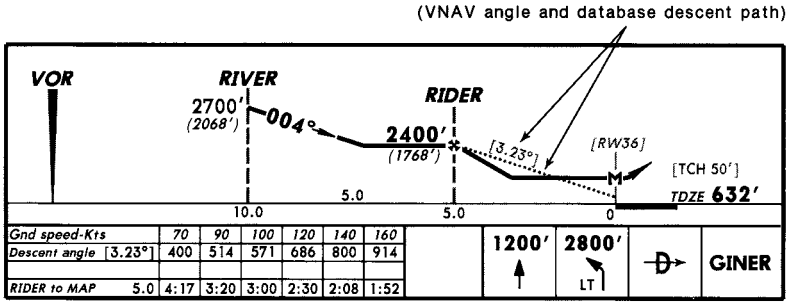
Vertical Navigation (VNAV) descent information will appear in the profile view of selected non-precision approaches beginning with charts dated 3 Dec 1999. The VNAV information appearing in the profile illustrates the geometric descent path with a descent angle from the Final Approach Fix (FAF) to the Threshold Crossing Height (TCH) at the approach end of the runway.

The VNAV descent path, depicted with a screened line, is based on the same descent angle coded into the Jeppesen NavData database. Use of this descent angle by certified VNAV-capable avionics equipment will ensure a stable, constant rate of descent that will clear all intervening altitude restrictions. Some approach procedures may require a delay of the start of descent beyond the FAF, until the VNAV descent path is intercepted. The profile view will depict this level segment of flight as required.

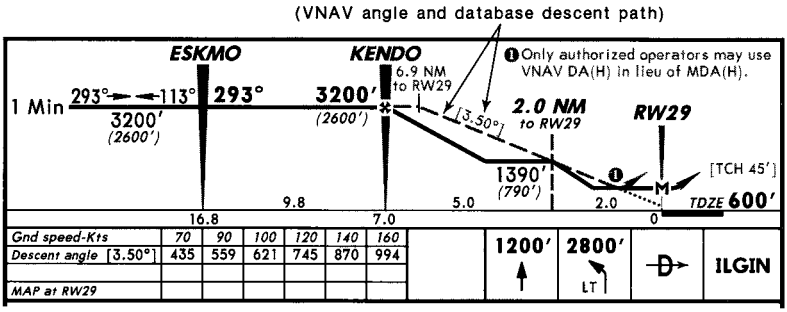
The VNAV descent angle appears in brackets along the VNAV descent path and is repeated in the conversion table. Additionally, the conversion table provides a recommended rate of descent relative to the VNAV angle and groundspeed.

The inclusion of the VNAV descent angle does not change or modify existing non-precision approach requirements. Usage of the Minimum Descent Altitude (MDA), as well as the Missed Approach Point (MAP), remains unchanged. In accordance with Federal Aviation Regulations (FARs) and ICAO PANS OPS criteria, do not descend below the MDA until attaining the required visual reference. Additionally, do not initiate the prescribed missed approach procedure prior to reaching the published missed approach point. Note: Operators may obtain permission from their controlling authority to use Decision Altitude (DA) operational techniques when making a VNAV descent. This approval is specific to the operator and to the approach.

VNAV descent is optional. Use of any VNAV approach technique is dependent on operator approval, certified VNAV-capable equipment availability, and crew training.



VNAV descent information from FAF to runway with TCH of 50′.



VNAV descent information from FAF to runway with TCH of 45′. Note that the VNAV path requires maintenance of level flight after the FAF, prior to intercepting the VNAV descent path of 3.50°, in order to cross the 2.0 NM to RW29 stepdown fix at or above 1390′. For approved operators, use of DA(H) operational technique on this approach is indicated by the ballflag note as well as by the dashed VNAV descent track in the profile view.

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AIRPORT CHART FORMAT

The airport chart is normally printed on the back of the first approach chart. At larger airports the airport chart will preceed the first approach chart and contain an enlarged diagram. Airport charts contain information pertaining to the airport including communications, take-off and alternate minimums, and IFR departure procedures. Separate airport charts may be included to display detailed ramp and parking positions or low visibility taxiway routes.

HEADING

Airport, Ramp and Taxiway charts
The Airport chart contains the location name, the airport name, airport elevation, latitude and longitude, Jeppesen NavData (ICAO) identifier, and date.



❶ Jeppesen NavData (ICAO) location identifier.

❷ Airport elevation.

❸ Bearing and distance to the airport from a VORTAC or VOR DME within 40 NM.

❹ Index number.

❺ Airport reference point (ARP) Latitude and Longitude.

❻ Airport name.

❼ Location name.

COMMUNICATIONS

Communications for departure are listed in order of normal use.

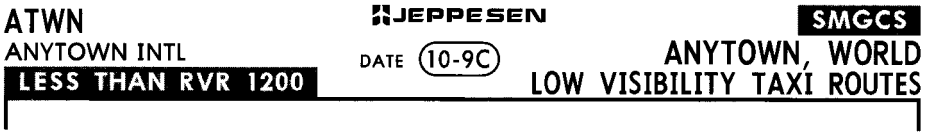
ATIS	ANYTOWN Clearance	Ground	Tower	ANYTOWN Departure (R)
125.6	120.3	121.9	118.1	118.9

AIRPORT DIAGRAM SYMBOLS



Magnetic variation.

Low Visibility Taxiway Charts
Low Visibility Taxiway Charts and Surface Movement Guidance and Control System (SMGCS) charts have special labels in the heading to indicate specific usage.



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SID/DP&STAR CHART LEGEND NEW FORMAT

Effective 16 August 2002

IMPORTANT NOTE

Legend pages titled "NEW FORMAT SID/DP/STAR" contain information specific to charts formatted in the new SID/DP/STAR chart concept. These legend pages include only those items that are unique to the NEW SID/DP/STAR FORMAT. For information not covered in the NEW FORMAT SID/DP/STAR chart legend, refer to the regular SID/DP/STAR chart legend pages in the Airway Manual.

SID/DP& STAR charts are graphic illustrations of the procedures prescribed by the governing authority. A text description may be provided, in addition to the graphic, when it is furnished by the governing authority. Not all items apply to all charts.

SID/DP/STAR CHART HEADING



SID/DP/STAR chart heading consists of the following:

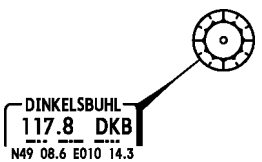
1. City/Location and State/Country names.
2. Chart type identifier.
3. Jeppesen NavData/ICAO/IATA airport identifier.
4. Airport name.
5. Revision date, index number and effective date.
6. Communication frequency.
7. Airport elevation.
8. Common placement of notes applicable to the procedure.

SID/DP/STAR CHART PLAN VIEW

PROCEDURE TITLE

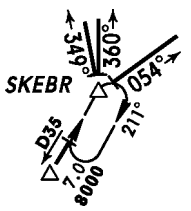
Navaids, intersections or waypoints identified in the procedure title (e.g., starting point of a STAR or end point of a SID/DP) are shown prominently for better identification. Navaid boxes will include a shadowed outline, intersection or waypoint names will be shown in larger text size.

Navaid



DINKELSBUL
Departure

Intersection



SKEBR ONE
Arrival

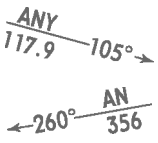
SPEED RESTRICTIONS

Speed restrictions that apply to the entire procedure are shown below the procedure title.



SYMBOLS

RADIALS



VOR Radials forming a position or fix. VOR Radials are bearings from the Navaid. NDB bearings are to the Navaid.

AIRPORTS



Civil or Joint use Airport



Airport with rotating beacon



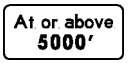
Military Airport

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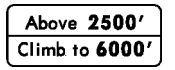
SID/DP&STAR CHART LEGEND NEW FORMAT

INFORMATION BOXES

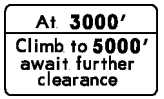
Information boxes are placed along the procedure tracks. Their content is associated with the graphical depiction of the SID/DP/STAR chart. Information boxes include a wide variety of action, instructions or restrictions such as: pilot actions, ATC instructions, directional and altitude instructions, climb restrictions, etc. Representative samples of information boxes are shown below.

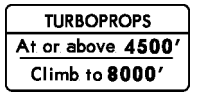


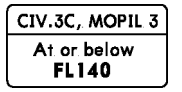


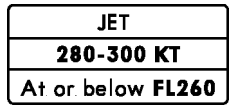






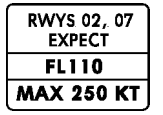


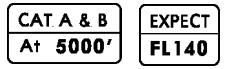












LOST COMMUNICATIONS PROCEDURE

The symbol below identifies the LOST COMMUNICATIONS PROCEDURE to be flown when communications are lost with ATC after take-off.



On recognition of communication failure Squawk 7600.

TEXT SECTION

A text description may be provided, in addition to the graphic, when it is furnished by the governing authority.

STAR

RWY	ROUTING
1L/R	From over Baset Int via ABC R-068 to Reedr Int, then via a 210° heading for RADAR vector to final approach course.

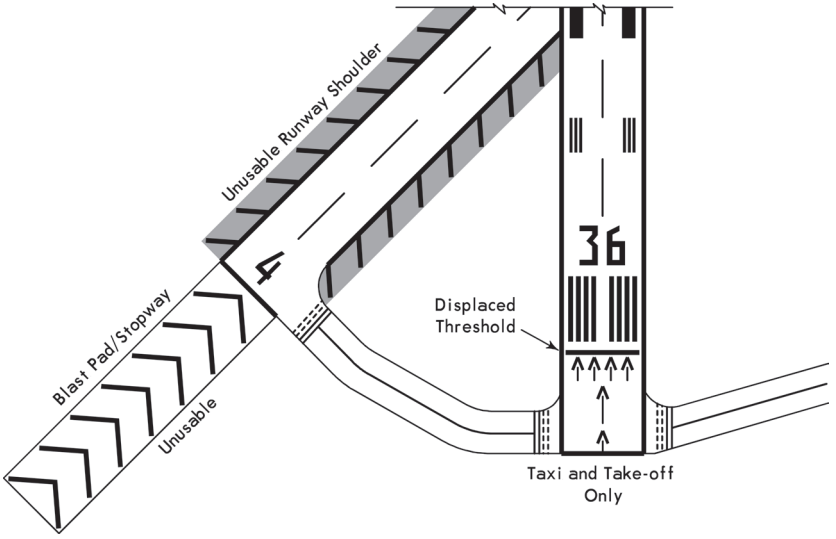
SID/DP

SID	RWY	ROUTING	CLIMB INSTRUCTION/ ALTITUDE
DKB 1D	07L/R	On runway track to 800', then via FR lctr to FRD 6	Climb to 4000'

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UNITED STATES INSTRUMENT RUNWAY MARKINGS

DISPLACED THRESHOLD MARKINGS AND MARKINGS FOR BLAST PADS AND STOPWAYS



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UNITED STATES INSTRUMENT RUNWAY MARKINGS

ENHANCED TAXIWAY CENTERLINE AND RUNWAY HOLDING POSITION MARKINGS

APPLICATION

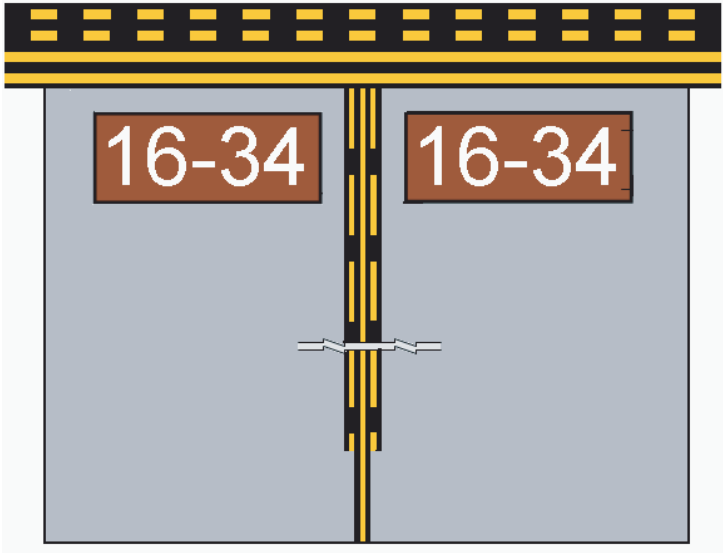
The taxiway centerline markings prior to runway holding positions are being enhanced to provide pilots with a visual cue that they are approaching a holding position. Runway holding position markings are also being extended onto the paved shoulders of taxiways and may be accompanied by surface painted holding position signs. These new markings will be the standard for many major airports in the United States.

CHARACTERISTICS

a. Taxiway centerline markings are modified beginning 150 feet prior to the runway holding position markings (where sufficient space is available) with the addition of parallel dashed yellow lines on both sides of the existing taxiway centerline.

b. Existing holding position markings are extended onto paved taxiway shoulders allowing them to be visible to pilots from the side windows of the cockpit for many aircraft.

c. Runway holding position signs may be painted on the surface of the taxiway on both sides of the taxiway centerline leading up to the runway holding position marking (where sufficient space is available), white numbers on red background.



END OF UNITED STATES AIRPORT SIGNS AND INSTRUMENT RUNWAY MARKINGS

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APPROACH CHART LEGEND — EU-OPS 1 AERODROME OPERATING MINIMUMS (AOM)

Publication of minimums does not constitute authority for their use by all operators. Each individual operator must obtain appropriate approval for their use.

GENERAL

Beginning in November 2008 Jeppesen will replace the current JAR-OPS 1 minimums with the new minimums introduced by the 2nd amendment to EU-OPS 1.

The "**Standard**" label in the upper left corner of the minimums box indicates that the minimums are based on EU-OPS 1 (Subpart E - Appendix 1 new to OPS 1.430). The "**JAR-OPS**" label in the upper left corner of the minimums box indicates that the minimums are based on JAR-OPS 1 or EU-OPS 1 (Subpart E - Appendix 1 old to OPS 1.430). For a detailed excerpt of EU-OPS 1 minimums refer to Air Traffic Control (ATC) Series 600 pages.

Jeppesen charted minimums are not below any State-provided minimums. Higher existing minimums for FAR 121 operators and those applying U.S. Operations Specifications are footnoted. RVR/CMV/VIS values are shown in measuring units as reported by the governing agency.

AOM for take-off and landing are either shown on Jeppesen instrument approach or aerodrome charts or on a separate minimums listing. Landing minimums will be shown as RVR, but values above 2000m will be designated as Converted Meteorological Visibility, prefixed "CMV". Take-off minimums are shown without prefix because they are either RVR or VIS. Circling minimums are always visibilities which is indicated in the circling minimums box. For the separate minimums listings RVR, CMV and VIS are abbreviated as R, C and V. The following table is used to convert a reported VIS into RVR/CMV.

CONVERSION OF REPORTED MET VIS TO RVR/CMV

Lighting elements in operation	RVR/CMV = Reported MET VIS x	
	Day	Night
HIALS and HIRL	1.5	2.0
Any type of lighting installation other than above	1.0	1.5
No lighting	1.0	Not Applicable

NOTE: Most of the samples focus only on the relevant information of the related paragraph. Other sections within the samples are intentionally left blank.

TAKE-OFF MINIMUMS

The application of these minimums may be limited by the obstacle environment in the take-off and departure area. The RVR/VIS minimums are determined to ensure the visual guidance of the take-off run phase. The subsequent clearance of obstacles is the responsibility of the operator. Low visibility take-off with RVR/VIS below 400m requires the verification that Low Visibility Procedures (LVP) have been established and are in force. RVR/VIS for the initial part of take-off run can be replaced by pilot assessment. The multiple RVR requirement means, that the required RVR value must be achieved for all of the relevant RVR reporting points, except for the initial part, which can be determined by pilot assessment. Approved operators may reduce their take-off minimums to 125m (aircraft categories A, B, C), 150m (category D) or to 75m (all categories) with an approved lateral guidance system.

Sample of Take-off Minimums

Standard TAKE-OFF [1]

All Rwys

LVP must be in Force

	[2] Approved Operators HIRL, CL & mult. RVR req	RL, CL & mult. RVR req	RL & CL	RCLM (DAY only) or RL	RCLM (DAY only) or RL	NIL (DAY only)
A						
B	*125m*	*150m*	*200m*	*250m*	*400m*	*500m*
C						
D	*150m*	*200m*	*250m*	*300m*		

[1] Operators applying U.S. Ops Specs: CL required below 300m; approved guidance system required below 150m.
[2] With approved guidance system: ABCD 75m.

CIRCLING MINIMUMS

Circling minimums will only be charted if a circling OCA(H) or MDA(H) is provided by the procedure source. Otherwise, the circling box will be removed. If circling is not authorized by the procedure source, it will be noted in the notes box of the Briefing Strip header. Where straight-in minimums are higher than circling minimums (DH/MDH or RVR/VIS), the circling MDH or visibility will be raised to match the straight-in minimums.

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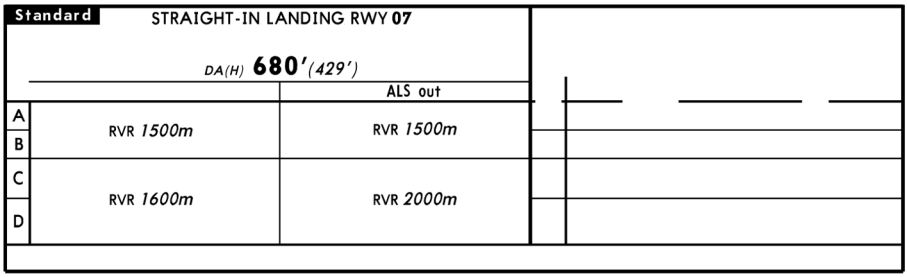
APPROACH CHART LEGEND — EU-OPS 1 AERODROME OPERATING MINIMUMS (AOM)

NON-PRECISION APPROACH MINIMUMS AND CHART PROFILE VIEW

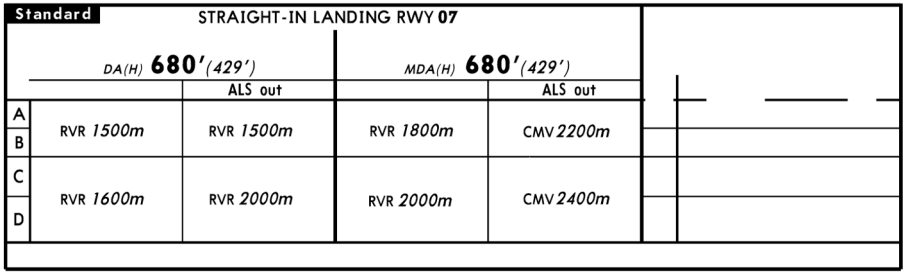
According to the EU-OPS requirements, all non-precision approaches shall be flown using the continuous descent final approach (CDFA) technique with decision altitude (height), and the missed approach shall be executed when reaching the DA(H) or the missed approach point (MAP), whichever occurs first.

The lateral part of the missed approach procedure must be flown via the MAP unless stated otherwise in the procedure. Normally only CDFA minimums are shown. These are identified by the use of a DA(H). Jeppesen does **not** include an add-on when publishing a DA(H) for a CDFA non-precision approach. Non-CDFA minimums are shown in exceptional cases and identified by an MDA(H).

Sample of Non-precision Minimums (CDFA)



Sample of Non-precision Minimums (CDFA + non-CDFA)



The profile depiction will be modified to show the continuous descent on final approach. Source-published minimum altitudes will be shown as segment minimum altitudes in the profile (grey shaded box). These minimum altitudes are typically provided for obstacle clearance and must not be violated to remain clear of obstacles or terrain.

If not published by the procedure source, a table depicting DME vs altitude, distance vs altitude, or timing vs altitude will be calculated by Jeppesen and shown above the profile view. The timing table includes the descent angle, the FAF and the altitude at the FAF. Altitudes are calculated for 20, 40, 60, 80 and 100s from FAF and are based on speeds of 90, 120, 140, 160 and 180kt. Only altitudes above the decision altitude are provided.

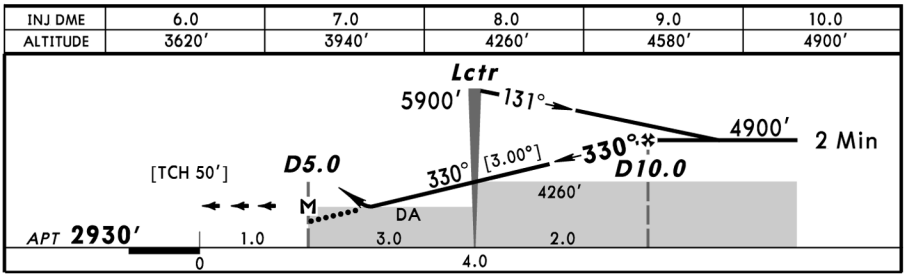
Sample of timing vs altitude table

LG Lctr: 5000'					
3.60°	20s	40s	60s	80s	100s
90 kt	**4810'**	**4620'**	**4430'**	**4240'**	**4050'**
120 kt	**4750'**	**4490'**	**4240'**	**3980'**	**3730'**
140 kt	**4710'**	**4410'**	**4110'**	**3820'**	**3520'**
160 kt	**4660'**	**4320'**	**3980'**	**3650'**	
180 kt	**4620'**	**4240'**	**3860'**		

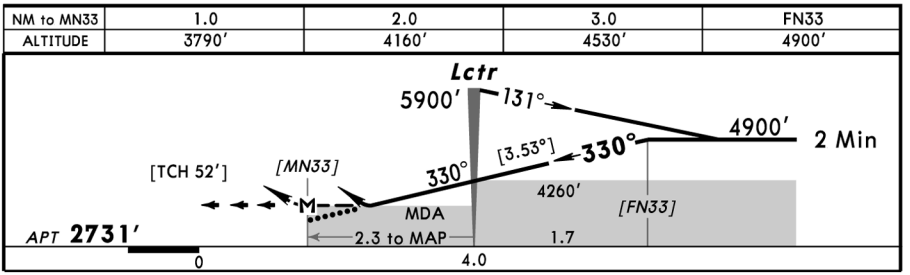
Where CDFA minimums are shown, the profile will be modified to depict the continuous descent. The missed approach pull-up arrow is shown at the point where the decision height is reached. There is no level segment depicted prior to the MAP, and the MAP is shown as published by the procedure source.

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APPROACH CHART LEGEND — EU-OPS 1 AERODROME OPERATING MINIMUMS (AOM)



In exceptional cases it may be necessary to include CDFA and non-CDFA minimums. Where this occurs, a level segment is shown prior to the missed approach point and the pull-up arrow is shown at the MAP.



CAT I PRECISION AND APV APPROACH MINIMUMS

An RVR of less than 750m may be used under the conditions a. to d. shown below (Full column). Otherwise the RVR is limited to 750m or above (Limited column).

a. CAT I operations to runways with FALS and TDZ and CL and with decision height of 200ft **or**

b. CAT I operations to runways with FALS but without TDZ and/or CL when using an approved HUDLS or an equivalent approved system **or**

c. CAT I operations to runways with FALS but without TDZ and/or CL when conducting a coupled or flight-director-flown approach to a decision height not less than 200ft **or**

d. APV to runways with FALS and TDZ and CL when using an approved HUD, but not below RVR 600m.

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APPROACH CHART LEGEND — EU-OPS 1 AERODROME OPERATING MINIMUMS (AOM)

Sample of CAT I Minimums (FALS + CL)

Standard STRAIGHT-IN LANDING RWY **26**

ILS

DA(H) AB: **1258'** *(200')* C: **1318'** *(260')*
D: **1388'** *(330')*

	FULL	Limited	ALS out
A	RVR *550m*	RVR *750m*	RVR *1200m*
B			
C	RVR *600m*		RVR *1300m*
D	RVR *800m*	RVR *800m*	RVR *1500m*

Sample of CAT I Minimums (IALS)

Standard STRAIGHT-IN LANDING RWY **26**

ILS

DA(H) AB: **1258'** *(200')* C: **1318'** *(260')*
D: **1388'** *(330')*

	FULL/Limited	ALS out
A	RVR *750m*	RVR *1200m*
B		
C	RVR *800m*	RVR *1300m*
D	RVR *1100m*	RVR *1500m*

Sample of APV Minimums (FALS + TDZ + CL)

Standard STRAIGHT-IN LANDING RWY **26**

LNAV/VNAV

DA(H) **1308'** *(250')*

		ALS out
A	RVR *750m* **1**	RVR *1300m*
B		
C		
D		

1 With TDZ, CL and HUD: RVR 600m

LOWER THAN STANDARD CAT I MINIMUMS

Operators must be approved by their authority to conduct lower than standard CAT I operations. For approved operators, tailored charts will be created on customer request.

CAT II PRECISION APPROACH MINIMUMS

Minimums are applicable to EU-OPS approved operators as well as to FAR 121 operators and those applying U.S. Operations Specifications (OpsSpecs). Higher existing minimums in accordance with U.S. OpsSpecs are footnoted.

The minimum RVR is 300m. But for category D it is required to conduct an autoland. Otherwise, the minimum RVR is 350m; however, this value is not charted on standard Jeppesen charts.

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APPROACH CHART LEGEND — EU-OPS 1 AERODROME OPERATING MINIMUMS (AOM)

Sample of CAT II Minimums

Standard	STRAIGHT-IN LANDING RWY 04 CAT II ILS	
	ABCD RA 141′ DA(H) 855′(100′)	LACFT RA 184′ DA(H) 877′(122′)
	RVR 300m 1	RVR 400m
1 Operators applying U.S. Ops Specs: Autoland or HGS required below RVR 350m.		

OTHER THAN STANDARD CAT II PRECISION APPROACH MINIMUMS

These minimums will only be published if the procedure is approved for their use by the aerodrome's Civil Aviation Authority. Charting is similar to standard CAT II minimums but includes columns for conditions with and without lights. An RVR of 400m or below can only be used if CL are available. Where the higher value of 450m is shown in the box, the lower value, which requires CL, is added as footnote.

Sample of Other Than Standard CAT II Minimums (FALS + CL)

Standard	STRAIGHT-IN LANDING RWY 04 CAT II ILS			
	ABCD RA 141′ DA(H) 855′(100′)		LACFT RA 184′ DA(H) 877′(122′)	
		ALS out		ALS out
	RVR 450m 1	RVR 700m	RVR 450m	RVR 700m
1 With CL: CAT A, B & C RVR 350m, CAT D RVR 400m				

Sample of Other Than Standard CAT II Minimums (IALS)

Standard	STRAIGHT-IN LANDING RWY 04 CAT II ILS			
	ABCD RA 141′ DA(H) 855′(100′)		LACFT RA 184′ DA(H) 877′(122′)	
		ALS out		ALS out
	RVR 450m	RVR 700m	RVR 500m	RVR 700m

CAT III PRECISION APPROACH MINIMUMS

CAT III minimums are only charted on tailored charts or on the Airline Chart series (CAO). The depiction depends on the customer's approved minimums (aircraft category or aircraft type).

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APPROACH CHART LEGEND — EU-OPS 1 AERODROME OPERATING MINIMUMS (AOM)

Standard — STRAIGHT-IN LANDING RWY 10

	CAT IIIA	ILS CAT II	CAT I			LOC (GS out)		CIRCLE-TO-LAND 2 Prohibited South of rwy, when LF(R)-6A active			
	DH 50′	RA 105′ DA(H) 656′ (100′)	DA(H) 756′ (200′)			DA(H) 830′ (274′)				W/o Local ATS 3	
			FULL	Limited	ALS out		ALS out	Max Kts	MDA(H) — VIS	MDA(H) — VIS	
C	RVR 200m	RVR 300m 1	RVR 550m	RVR 750m	RVR 1200m	RVR 750m	RVR 1300m	180	1190′ (634′) 2400m	1530′ (974′) 2400m	
D								205	1290′ (734′) 3600m	1600′ (1044′) 3600m	

1 Operators applying U.S. Ops Specs: Autoland or HGS required below RVR 350m.
2 Circling height based on rwy 10 displ thresh elev of 556′. 3 NIGHT: NOT AUTHORIZED.

AERODROME MINIMUMS LISTING

On customer request, the minimums may be made available on a minimums listing page. The listings are indexed as 10-9S, 20-9S, etc. This listing is an interim solution until all affected approach and airport charts are converted to the new minimums.

EDCM/RLI — JEPPESEN — 21 SEP 08 (10-9S) — **Standard**

KAMENZ, EUROPEAN UNION

MAY BE INTL

STRAIGHT-IN RWY		A	B	C	D
29L	ILS ❶	**5087**′(223′) **R550m**	**5087**′(223′) **R550m**	**5087**′(223′) **R550m**	**5087**′(223′) **R550m**
	ALS out	R1200m	R1200m	R1200m	R1200m
	LOC	NOT APPLICABLE			
	VOR DME ❷	**5510**′(646′) **R1500m**	**5510**′(646′) **R1500m**	**5510**′(646′) **C2300m**	**5510**′(646′) **C2300m**
	ALS out	R1500m	R1500m	C2400m	C2400m
	NDB DME	**5510**′(646′) **C2500m**	**5510**′(646′) **C2500m**	**5510**′(646′) **C2700m**	**5510**′(646′) **C2700m**
	ALS out	C3200m	C3200m	C3400m	C3400m
29R	VOR DME ❷	**5810**′(948′) **R1500m**	**5810**′(948′) **R1500m**	**5810**′(948′) **C2400m**	**5810**′(948′) **C2400m**
	ALS out	R1500m	R1500m	C2400m	C2400m
	NDB DME	**5810**′(948′) **C3800m**	**5810**′(948′) **C3800m**	**5810**′(948′) **C4000m**	**5810**′(948′) **C4000m**
	ALS out	C4500m	C4500m	C4700m	C4700m

❶ Missed apch climb gradient mim 4.0%
❷ Continuous Descent Final Approach

CIRCLE-TO-LAND	100 KT	135 KT	180 KT	205 KT
Not authorized North of airport	**5870**′(950′) 1500m ❸	**5770**′(950′) 1600m ❸	**6380**′(1460′) 2400m ❸	**6380**′(1460′) 3600m ❸

❸ or higher minimums of preceding straight-in approach

TAKE-OFF RWY 11L/R, 29L/R

	LVP must be in Force: RCLM (DAY only) or RL	RCLM (DAY only) or RL	NIL (DAY only)
A, B, C	250m	400m	500m
D	300m		

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DEPICTION OF EU-OPS AOM IN CASE OF EXISTING STATE MINIMUMS

If State minimums are officially published, the depiction of AOM may differ from the standard depiction where all values are expressed as RVR or CMV.

a. If RVR/CMV and VIS are charted together, the RVR value is compulsory. If no RVR is reported, the VIS has to be used without conversion.

b. No prefix is charted if RVR/CMV and VIS is identical. The reported RVR is compulsory. If no RVR is reported, the VIS has to be used without conversion.

c. If only VIS is charted, the VIS has to be used without conversion.

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Nav2001
AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

PROVIDED FOR USERS OF JEPPESEN NAVDATA SERVICES

PREFACE

The purpose in providing the information contained in these pages is to highlight the major differences between Jeppesen's NavData database and Jeppesen's Enroute, Area, SID, DP, STAR, Approach, and Airport Charts.

Airways, departure procedures, arrival procedures, instrument approach procedures, and other aeronautical information is designed and created by more than 220 countries around the world. The information created by them is designed according to ICAO PANS OPS in most countries and according to the United States Standard for Terminal Instrument Procedures (TERPs) for the U.S. and many of the other countries.

The basic design for most aeronautical information contained in instrument procedures has been created for the analog world. The art of entering data into an aeronautical database is one that balances the intent of the original procedure designer and the requirements of FMS and GPS systems that require airborne databases.

All of the illustrations in this paper are from Jeppesen's library and are copyrighted by Jeppesen. The paper will highlight differences that will be found in the charts and databases produced by all the suppliers.

Virtually all the aeronautical databases are loaded according to the specifications in the Aeronautical Radio, Incorporated (ARINC) 424 standard "Navigation Databases." While the ARINC 424 specification covers a large percentage of the aeronautical requirements, it is impossible to write a specification that covers every combination of factors used to design and fly instrument procedures. Many of the differences between charts and databases are because there can be no standard implemented to have the information in both places depicted the same. There are some cases where it is desirable not to have the information the same because of the different type of media where the information is displayed.

Any attempt to detail the many minor differences, which may arise under isolated cases, would unduly complicate this overview. Therefore, the information provided is an overview only, and only major differences are included.

There are many different types of avionics equipment utilizing the Jeppesen NavData database. *The same database information may be presented differently on different types of airborne equipment. In addition, some equipment may be limited to specific types of database information, omitting other database information. Pilots should check their Operating Handbooks for details of operation and information presentation. A major factor in "apparent" differences between database and charts may be due to the avionics equipment utilized. As avionics equipment evolves, the newer systems will be more compatible with charts, however the older systems will still continue with apparent differences.*

Due to the continuing evolution caused by aeronautical information changes affecting both database and charting, items described herein are subject to change on a continual basis. This document may be revised for significant changes to help ensure interested database users are made aware of major changes.

A brief Glossary/Abbreviations of terms used is provided at the end of this document.

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DIFFERENCES BETWEEN JEPPESEN DATABASE AND CHARTS

1. EFFECTIVE DATES

AERONAUTICAL INFORMATION CUT-OFF DATES

Because of the required time it takes to physically get the database updated, extracted, produced, delivered, and loaded into FMS/GPS systems, the database cut-off dates (when aeronautical information can no longer be included in the next update) are often earlier for databases than for charts. This may cause information on charts to be more current than the information in databases.

The ICAO Aeronautical Information Regulation and Control (AIRAC) governs the 28-day cycle between effective dates of aeronautical information. These are the same effective dates used for aeronautical databases. Because governments may use slightly different cycles, there are differences between charts and databases. Charts typically use 7-day and 14-day cycles for terminal charts and 28-day and 56-day cycles for enroute and area charts.

2. GENERAL DIFFERENCES

GENERAL - CHARTED INFORMATION NOT PROVIDED IN THE JEPPESEN NAVDATA DATABASE

Not all the information that is included on the charts is included in the airborne database. The following is a general listing of some of those items. More specific items are included in individual entries throughout this document.

Altimetry:
- QNH/QFE information
- Alternate altimeter setting sources

Intersection formations (radials, bearings, DME)
Terrain and Obstacles
Airport Operating Minimums
- Landing, take-off and alternate minimums

Airport taxiways and ramps
Some types of special use airspace and controlled airspace

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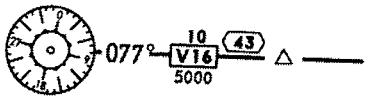
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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

2. GENERAL DIFFERENCES (Cont)

MAGNETIC COURSES, DISTANCES

Because of different magnetic models used in airborne systems, a magnetic course read on the airborne system may differ from the charted magnetic course. Avionics computed distances may disagree with charted distances. Differences may appear on airways on Enroute Charts, and on flight procedures included on SID, DP, STAR, Approach, and Airport charts. In addition, when the database requires a specific course to be flown from "A" to "B", the differences in magnetic variation or VOR station declination may result in a "jog" between the two fixes in lieu of a direct track.

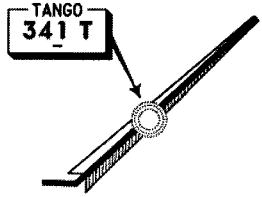


REFERENCE DATUM

Not all States (countries) have complied with the ICAO Annex that specifies the use of the WGS-84 reference datum. Differences in reference datums can cause significant "accuracy bias" in the navigation guidance provided by avionics systems. A listing of the States that have published their coordinates in WGS-84 can be found on Jeppesen's web site at www.jeppesen.com/onlinepubs/wgs-84.phtml.

3. NAVAIDS

COMPLETENESS - Because of the duplication of identifiers and other factors, not all charted navaids are included in the database.



NDB AND LOCATOR IDENTIFIERS

As an example of the differences between the display from one avionics system to another, some avionics systems will display the Foley NDB as "FPY":



Some avionics systems include a suffix "NB" after the NDB identifiers and will display the Foley NDB as "FPYNB". For NDBs and locators with duplicate Morse code identifiers that are located within the same State (country), they may only be available using the airport identifier for access.

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3. NAVAIDS (Cont)

LOCATOR IDENTIFIERS

Most locators in the United States have unique five-letter names, but most international locators have names that do not have five letters.

Some systems may display U.S. locators as "CASSE".

Some systems may display U.S. locators as "AP".



DUPLICATE NAVAID IDENTIFIERS

There are numerous duplicates in the database. Refer to your avionics handbook for the proper procedure to access navaids when duplicate identifiers are involved.

Not all navaids in the database are accessible by their identifier. Some navaids, for reasons such as duplication within terminal areas or lack of complete information about the navaid, are in the waypoint file and are accessible by their name or abbreviated name.

4. WAYPOINTS

WAYPOINT DATABASE IDENTIFIERS

"Database identifiers" refers to identifiers used only in avionics systems utilizing databases. The identifiers are not for use in flight plans or ATC communications; however, they are also included in computer flight planning systems. They may be designated by the State (country) as "Computer Navigation Fixes" (CNFs), or designated by Jeppesen. To facilitate the use of airborne avionics systems, the identifiers are being added to Jeppesen's charts. Both the CNFs created by States and the Jeppesen-created database identifiers are enclosed within square brackets and in italics.

- Jeppesen's ultimate goal is to include all database identifiers for all waypoints/fixes on the charts.
- Enroute charts include the five-character identifier for unnamed reporting points, DME fixes, mileage breaks, and for any reporting point with a name that has more than five characters.
- SID, DP and STAR charts are being modified to include all identifiers.

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4. WAYPOINTS (Cont)

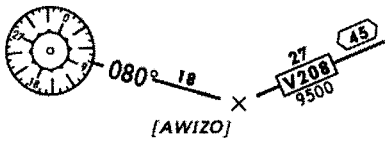
WAYPOINT DATABASE IDENTIFIERS (Cont)

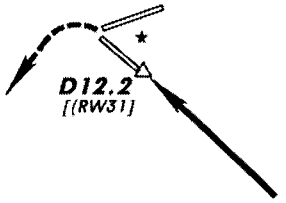
- Approach Charts

  VNAV descent angle information derived from the Jeppesen NavData database is being added to approach charts. Identifiers are shown for the Final Approach Fix (FAF), Missed Approach Point (MAP), and the missed approach termination point.

  State-named Computer Navigation Fixes (CNFs) are shown on all applicable charts.

  GPS (GNSS) type approach charts include all database identifiers.





COMMON WAYPOINT NAME FOR A SINGLE LOCATION

Government authorities may give a name to a waypoint at a given location, but not use the name at the same location on other procedures in the same area. The Jeppesen NavData database uses the same name for all multiple procedure applications. Charting is limited to the procedure/s where the name is used by the authorities.

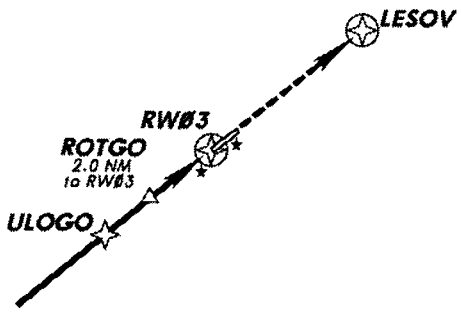
FLY-OVER versus FLY-BY FIXES/WAYPOINTS

In most cases, pilots should anticipate and lead a turn to the next leg. The database indicates when the fix must be crossed (flown-over) before the turn is commenced. The fix is coded as fly-over when the requirement is inferred or is specified by the governing authority. Fixes are charted as fly-over fixes only when specified by the governing authority.

Fly-over fixes have a circle around the fix/waypoint symbol. No special charting is used for fly-by fixes.

ULOGO and ROTGO
Are fly-by waypoints.

RW03 and LESOV
Are fly-over waypoints.



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5. AIRWAYS

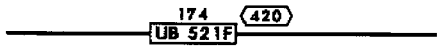
ATS ROUTES

Airways identified as ATC routes by States (countries) cannot be uniquely identified. They are not included in the Jeppesen NavData database.



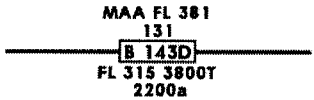
DESIGNATORS

Jeppesen NavData database airway designators are followed by a code indicating ATC services (such as A for Advisory, F for Flight Information) when such a code is specified by the State (country). Not all airborne systems display the ATC services suffix.



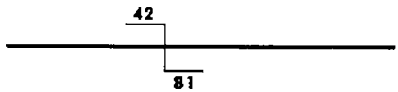
ALTITUDES

Minimum Enroute Altitudes (MEAs), Minimum Obstacle Clearance Altitudes (MOCAs), Off Route Obstacle Clearance Altitudes (OROCAs), Maximum Authorized Altitudes (MAAs), Minimum Crossing Altitudes (MCAs), Minimum Reception Altitudes (MRAs), and Route Minimum Route Off-Route Altitudes (Route MORAs) - - These minimum altitudes for airways are not displayed in most avionics systems.



CHANGEOVER POINTS

Changeover points (other than mid-point between navaids) are on charts but are not included in the Jeppesen NavData database.



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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

6. ARRIVALS AND DEPARTURES

PROCEDURES NOT IN THE DATABASE

Jeppesen publishes some officially designated departure procedures that include only text on IFR airport charts beneath the take-off minimums. They may be labeled "Departure Procedure", "IFR Departure Procedure", or "Obstacle DP". Most of these are U.S. and Canadian procedures, although there is a scattering of them throughout the world. Any waypoint/fix mentioned in the text is in the Jeppesen NavData database. *However, these text-only departure procedures are not in the database.*

<table>
<tr><td colspan="4">TAKE-OFF & OBSTACLE DEPARTURE PROCEDURE</td></tr>
<tr><td></td><td colspan="2">Rwy 17</td><td>Rwy 35</td></tr>
<tr><td></td><td>Adequate Vis Ref</td><td>STD</td><td></td></tr>
<tr><td>1 & 2 Eng</td><td rowspan="2">1/4</td><td>1</td><td rowspan="2">NA</td></tr>
<tr><td>3 & 4 Eng</td><td>1/2</td></tr>
<tr><td colspan="4">OBSTACLE DP: Rwy 17, Climbing right turn to 2000'
via heading 200° and TTT R-180 to Nahmu D20.0,
before proceeding on course or AS CLEARED BY ATC.</td></tr>
</table>

Some States publish narrative descriptions of their arrivals, and depict them on their enroute charts. They are unnamed, not identified as arrival routes, and are not included in the Jeppesen NavData database. Some States publish "DME or GPS Arrivals", and because they are otherwise unnamed, they are not included in the database.

PROCEDURE TITLES

Procedure identifiers for routes such as STARs, DPs and SIDs are in airborne databases but are limited to not more than six alpha/numeric characters. The database generally uses the charted computer code (shown enclosed within parentheses on the chart) for the procedure title, as

CHART:	Cyote Four Departure(CYOTE.CYOTE4) becomes
DATABASE	CYOTE4.

When no computer code is assigned, the name is truncated to not more than six characters. The database procedure identifier is created according to the ARINC 424 specifications.

Database procedure identifiers are charted in most cases. They are the same as the assigned computer code (charted within parentheses) or are being added [*enclosed within square brackets].* Do not confuse the bracketed database identifier with the official procedure name (which will be used by ATC) or the official computer code (which is used in flight plan filing).

400-FOOT CLIMBS

Virtually all departures in the database include a climb to 400 feet above the airport prior to turning because of requirements in State regulations and recommendations. The 400-foot climb is not depicted on most charts. When States specify a height other than 400 feet, it will be in the Jeppesen NavData database.

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6. ARRIVALS AND DEPARTURES (Cont)

TAKE-OFF MINIMUMS AND CLIMB GRADIENTS

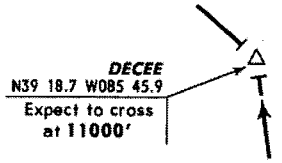
The take-off minimums and climb gradients that are depicted on the charts are not included in the database.

This SID requires a ceiling and visibility of 1200-3 and a climb gradient of 410'/NM to 5000'.

Gnd speed-Kts	75	100	150	200	250	300
410' per NM	513	683	1025	1367	1708	2050

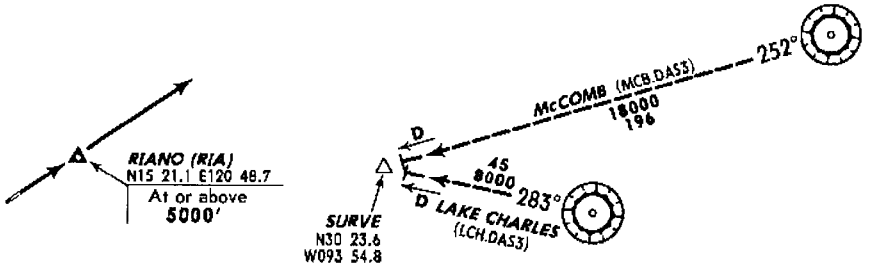
"EXPECT" and "CONDITIONAL" INSTRUCTIONS

Altitudes depicted on charts as "Expect" instructions, as "Expect to cross at 11,000'" are not included in the Jeppesen NavData database. When "Conditional" statements such as "Straight ahead to ABC 8 DME or 600', whichever is later", are included on the charts, only one condition can be included in the database.



ALTITUDES

Databases include charted crossing altitudes at waypoints/fixes. Charted Minimum Enroute Altitudes (MEAs) and Minimum Obstacle Clearance Altitudes (MOCAs) are not included. The 5,000-foot altitude at RIANO is included in the database. The MEAs between SURVE and the two VORs are not included.



STAR OVERLAPPING SEGMENTS

STARs normally terminate at a fix where the approach begins or at a fix where radar vectoring will begin. When STAR termination points extend beyond the beginning of the approach, some avionics equipment may display a route discontinuity at the end of the STAR and the first approach fix.

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7. APPROACH PROCEDURE (TITLES and OMITTED PROCEDURES)

ICAO PANS OPS approach procedure titles are officially labeled with the navaid(s) used for the approach and are different than approach procedure titles labeled according to the TERPs criteria, which are labeled only with navaids required for the final approach segment. Because of the limited number of characters that are available for the procedure title, the name displayed on the avionics equipment may not be the same as the official name shown on the approach chart.

The Jeppesen NavData database, in accordance with ARINC 424 specifications, codes the approach procedure according to procedure type and runway number. "Similar" type approaches to the same runway may be combined under one procedure title, as ILS Rwy 16 and NDB VOR ILS Rwy 16 may read as ILS Rwy 16. The actual avionics readout for the procedure title varies from manufacturer to manufacturer.

Some avionics systems cannot display VOR and VOR DME (or NDB and NDB DME) approaches to the same runway, and the approach displayed will usually be the one associated with DME.

Currently:

Generally, most Cat I, II, and III ILS approaches to the same runway are the same basic procedure, and the Cat I procedure is in the database. However, in isolated cases, the Cat I and Cat II/III missed approach procedures are different, and only the Cat I missed approach will be in the database.

Additionally, there may be ILS and Converging ILS approaches to the same runway. While the converging ILS approaches are not currently in the database, they may be at some later date.

Some States are using the phonetic alphabet to indicate more than one "same type, same runway" approach, such as ILS Z Rwy 23 and ILS Y Rwy 23. The phonetic alphabet starts are the end of the alphabet to ensure there is no possibility of conflict with circling only approaches, such as VOR A.

In isolated cases, procedures are intentionally omitted from the database. This occurs primarily when navaid/waypoint coordinates provided by the authorities in an undeveloped area are inaccurate, and no resolution can be obtained. Additionally, the ARINC 424 specifications governing navigation databases may occasionally prohibit the inclusion of an approach procedure.

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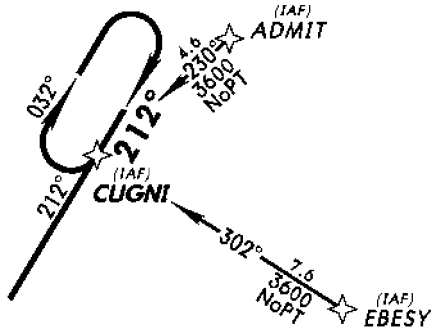
AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

8. APPROACH PROCEDURES (PLAN VIEW)

INITIAL APPROACH FIX (IAF), INTERMEDIATE FIX (IF), FINAL APPROACH FIX (FAF) DESIGNATIONS

These designations for the type of fix for operational use are included on approach charts within parentheses when specified by the State, but are not displayed on most avionics systems.

ARINC 424 and TSO C-129 specifications require the inclusion of GPS approach transitions originating from IAFs. Authorities do not always standardize the assignment of IAFs, resulting in some cases of approach transitions being included in the database that do not originate from officially designed IAFs

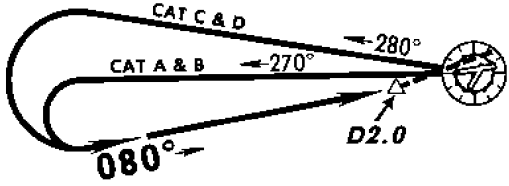


BASE TURN (TEARDROP) APPROACHES

Depending upon the divergence between outbound and inbound tracks on the base turn (teardrop turn), the turn rate of the aircraft, the intercept angle in the database, and the wind may cause an aircraft to undershoot the inbound track when rolling out of the turn, thus affecting the intercept angle to the final approach. This may result in intercepting the final approach course either before or after the Final Approach Fix (FAF).

ROUTES BY AIRCRAFT CATEGORIES

Some procedures are designed with a set of flight tracks for Category A & B aircraft, and with a different set of flight tracks for Category C & D. In such cases, the database generally includes only the flight tracks for Category C & D.



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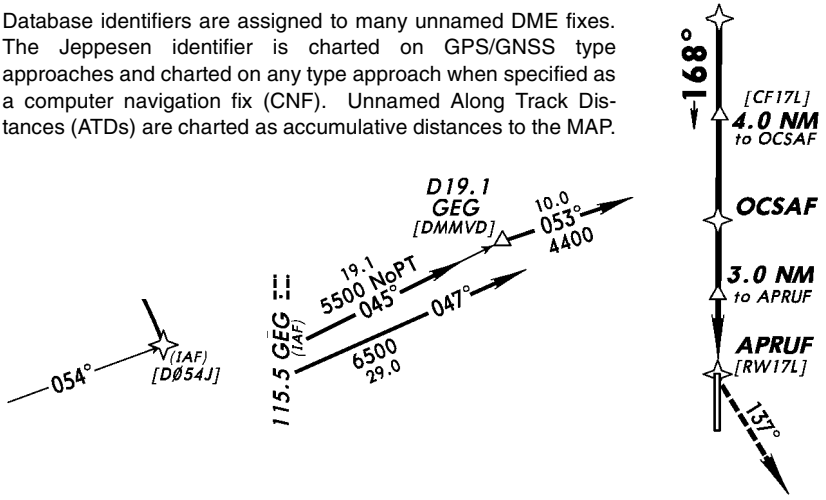
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8. APPROACH PROCEDURES (PLAN VIEW) (Cont)

DME and ALONG TRACK DISTANCES

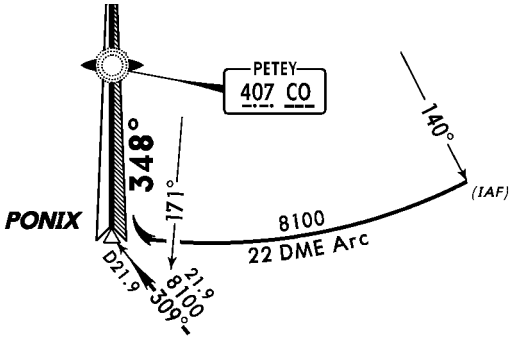
Database identifiers are assigned to many unnamed DME fixes. The Jeppesen identifier is charted on GPS/GNSS type approaches and charted on any type approach when specified as a computer navigation fix (CNF). Unnamed Along Track Distances (ATDs) are charted as accumulative distances to the MAP.



APPROACH TRANSITION TO LOCALIZER

For DME arc approach transitions with lead-in radials, the fix at the transition "termination point" beyond the lead in radial is dropped by many avionics systems.

West bound on the 22 DME arc, the leg after the 171° lead-in radial may not be displayed in all avionics equipment.



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9. APPROACH PROCEDURES (PROFILE)

VERTICAL DESCENT ANGLES

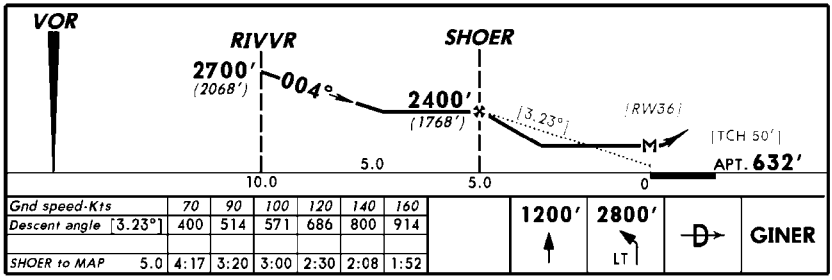
Vertical descent angles for most *straight-in non-precision landings are included in the database and published on charts with the following exceptions:

1) When precision and non-precision approaches are combined on the same chart, or

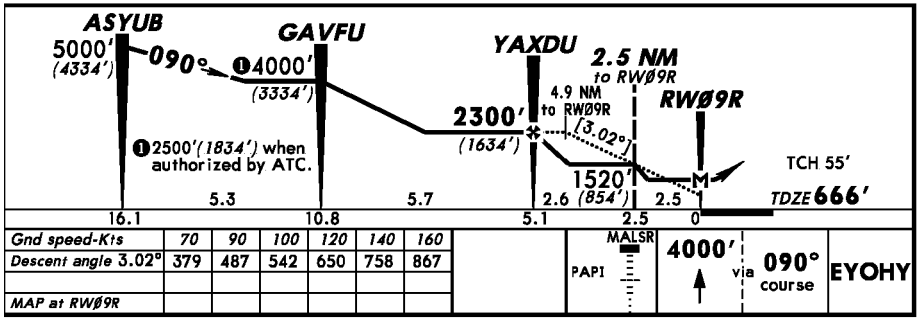
2) Some procedures based on PANS OPS criteria with descent gradients published in percentage or in feet per NM/meters per kilometer. However, these values are being converted into angles and are being charted.

*Descent angles for circle-to-land only approaches are currently not in the database and are not charted.

In the United States, many non-precision approaches have descent angles provided by the FAA and are depicted on the approach charts. For many of the U.S. procedures, and in other countries, the descent angles are calculated based on the altitudes and distances provided by the State authorities. These descent angles are being added to Jeppesen's charts.



Gnd speed-Kts	70	90	100	120	140	160
Descent angle [3.23°]	400	514	571	686	800	914
SHOER to MAP 5.0	4:17	3:20	3:00	2:30	2:08	1:52



Gnd speed-Kts	70	90	100	120	140	160
Descent angle 3.02°	379	487	542	650	758	867
MAP at RWØ9R						

The descent angle accuracy may be affected by temperature. When the outside air temperature is lower than standard, the actual descent angle will be lower. Check your avionics equipment manuals since some compensate for nonstandard temperatures.

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9. APPROACH PROCEDURES (PROFILE) (Cont)

DATABASE IDENTIFIERS

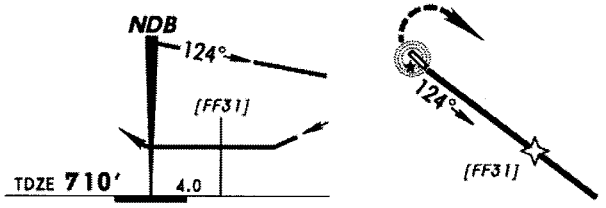
For approach charts where the descent angle is published, all database identifiers from the Final Approach Fix (FAF) to the missed approach termination point are charted in both the plan and profile views. When an FAF is not specified, the NavData database Sensor Final Approach Fix (FAF) is included in the database and is charted.

FINAL APPROACH CAPTURE FIX (FACF)

Databases include (when no suitable fix is specified in source) a FACF for localizer based approaches and those based on VOR DME, VORTAC, or NDB and DME. In most cases, it is the fix identified as the intermediate fix. The FACF is charted only when specified by the State.

GPS/GNSS SENSOR FAF

The Jeppesen NavData database includes a sensor final approach fix when the approach was not originally designed with an FAF, and they are charted on "GPS/GNSS type" approaches.



FINAL APPROACH FIX (FAF), ILS and LOCALIZER APPROACHES

There may be several types of fixes charted at the same FAF location - locator, waypoint, intersection, DME fix, OM, or perhaps an NDB instead of a locator. Since many airborne navigation systems with databases don't store locators and NDBs as navaids, a four- or five-character identifier will be used for the FAF on ILS and localizer approaches. The four- or five-character identifier assigned to the FAF location is contained in the waypoint file of the Jeppesen NavData database.

If there is a named intersection or waypoint on the centerline of the localizer at the FAF, the name of the fix will be used for the FAF location.

The FAF must be on the localizer centerline or the avionics system will fly a course that is not straight. Frequently, OMs and LOMs are not positioned exactly on the localizer centerline, and a database fix is created to put the aircraft on a straight course.

When the LOM is on the centerline and there also is a named intersection or waypoint on the centerline, the name of the intersection or waypoint will be used for the FAF. For CHUPP LOM/Intersection, the database identifier is "CHUPP" because there is an intersection or waypoint on the centerline of the localizer at the FAF.

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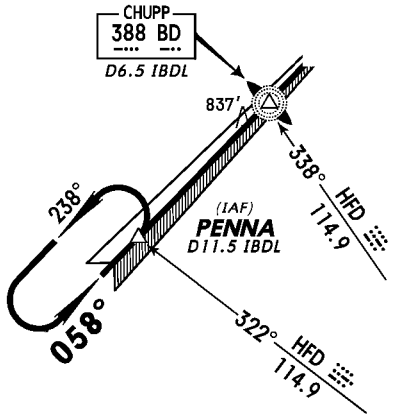
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9. APPROACH PROCEDURES (PROFILE) (Cont)

FINAL APPROACH FIX (FAF), ILS and LOCALIZER APPROACHES (Cont)

When the ILS or localizer procedure is being flown from the database, the four- or five-character name or identifier such as CHUPP, FF04, or FF04R, etc. will be displayed as the FAF.

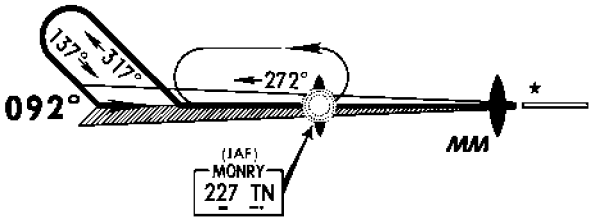
If the LOM is not on the localizer centerline, an identifier such as FF04L may be the identifier for the computed "on centerline" final approach fix for runway 04L. If there is only an outer marker at the FAF, the FAF identifier may be OM04L.



When there is no intersection or waypoint at the FAF such as at the MONRY LOM, the database identifier will be

"OM09" if the LOM is on the centerline, and

"FF09" if the LOM is not on the centerline.



In some systems, to access the locator on most ILS and localizer approaches, the Morse code identifier can be used.

In the United States, virtually all locators have a five-letter unique name/identifier so the location can usually be accessed in some systems by the navaid Morse code identifier or the five-letter name. In some systems, the locator is accessed by the name or by adding the letters "NB" to the Morse code identifier.

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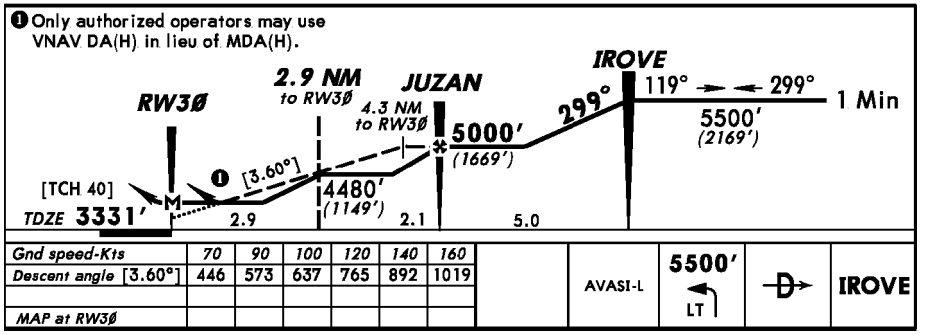
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9. APPROACH PROCEDURES (PROFILE) (Cont)

NAMED and UN-NAMED STEPDOWN FIXES, FINAL APPROACH FIX (FAF) to MISSED APPROACH POINT (MAP)

Named and un-named stepdown fixes between the FAF and MAP are currently not included in the databases, but will be added in the future. They are often DME fixes, and in those cases, can be identified by DME. The distance to go to the MAP may be labeled on some GPS/GNSS type charts and VOR DME RNAV charts. Proper identification of these displayed fixes is necessary to clear all stepdown fix crossing altitudes.



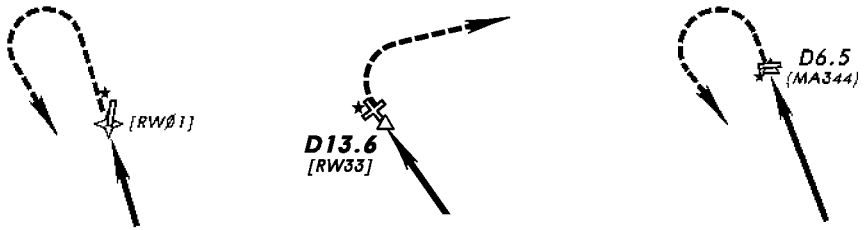
ILS AND RUNWAY ALIGNMENT

Differences in government specified values for localizer and airport variation may cause apparent non-alignment of the localizer and the runway. These differences are gradually being resolved, and whenever possible the airport variation is used for the localizer variation.

10. APPROACH PROCEDURES (MISSED APPROACH)

MISSED APPROACH POINT (MAP)

For non-precision approaches, when the MAP is other than a navaid, there will be a database MAP waypoint with a unique identifier. If the MAP is a waypoint and is at or within 0.14 NM of the threshold the MAP identifier will be the runway number, as "RW04" for Rwy 4 threshold. If the MAP is not at the runway, there will either be an official name for the MAP, or an identifier is provided. GPS/GNSS type approaches, and charts with descent angles, include the database identifier of the MAP.



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10. APPROACH PROCEDURES (MISSED APPROACH) (Cont)

400-FOOT CLIMBS

The database includes a climb to 400 feet above the airport prior to turning on a missed approach. This climb is not part of the official procedure, but does comply with State regulations and policies. This specific climb to 400 feet is not included on charts. The missed approach text supplied by the State authority is charted.

MISSED APPROACH: Turn RIGHT track 080° to intercept CS VOR R-040 (040° bearing from CS NDB). Climb to 5000' and track to D15 CS or GPS or as directed by ATC.

LIMITATION: Max 185 Kt IAS until established on CS VOR R-040 (040° bearing from CS NDB).

CAUTION: Do NOT delay turn onto 080° due to high terrain West of Missed Approach Area.

MISSED APPROACH PROCEDURE

The routes/paths that comprise a missed approach are not always displayed in some avionics systems that use databases. Additionally, some avionics systems that include missed approach procedures don't always implement a full set of path terminators so many legs will not be included in the airborne database. ***Refer to the charted missed approach procedure when executing a missed approach.***

MISSED APPROACH: Climb to **1500'** then climbing **LEFT** turn to **2400'** via heading **280°** and outbound **TUL VOR R-238** to **KEVIL INT** and hold.

11. ROUTES ON CHARTS BUT NOT IN DATABASES

The routes in approach procedures, SIDs (DPs), and STARs are coded into the database using computer codes called path terminators which are defined in the ARINC 424 Navigation Database Specification. A path terminator 1) Defines the path through the air, and 2) Defines the way the leg (or route) is terminated. Not all avionics systems have implemented the full set of path terminators specified in the ARINC 424 document.

Because of the incomplete set of path terminators in some avionics systems, pilots need to ensure their avionics systems will take them on the routes depicted on the charts. If the avionics systems don't have all the routes, or don't have the means to display them, it is the pilot's responsibility to fly the routes depicted on the charts.

FINAL COCKPIT AUTHORITY, CHARTS OR DATABASE

There are differences between information displayed on your airborne avionics navigation system and the information shown on Jeppesen charts. *The charts, supplemented by NOTAMs, are the final authority.*

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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

GLOSSARY/ABBREVIATIONS

AIRAC - Aeronautical Information Regulation and Control. Designates the revision cycle specified by ICAO, normally 28 days.

ARINC - Aeronautical Radio, Inc

ATD - Along Track Distance, as "3 NM to RW24".

ATS Route - Officially designated route. No designator assigned.

CNF - Computer Navigation Fix

DATABASE IDENTIFIER - Avionics system use only, not for flight plans or ATC communications. Identifies a waypoint or fix.

DP - Departure Procedure

FAA - Federal Aviation Administration

FACF - Final Approach Capture Fix. Database includes (usually as an intermediate fix) when no suitable fix is specified in source.

FAF - Final Approach Fix

FLY-BY FIX - Waypoint allows use of turn anticipation to avoid overshoot of the next flight segment.

FLY-OVER FIX - Waypoint precludes any turn until the fix is over flown and is followed by an intercept maneuver of the next flight segment.

FMS - Flight Management System

GNSS - Global Navigation Satellite System

GPS - Global Positioning System

GPS/GNSS SENSOR FAF - Database fix that changes sensitivity of the Course Deviation Indicator (CDI) on final approach.

GPS/GNSS TYPE APPROACHES - Any approach that can be flown with GPS/GNSS as the only source of navigation.

ICAO - International Civil Aviation Organization

IAF - Initial Approach Fix

IF - Intermediate Approach Fix

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GLOSSARY/ABBREVIATIONS (Cont)

LOM - Locator Outer Marker

MAP - Missed Approach Point

MAA - Maximum Authorized Altitude

MCA - Minimum Crossing Altitude

MOCA - Minimum Obstacle Crossing Altitude

MORA - Minimum Off-Route Altitude

MRA - Minimum Reception Altitude

NavData - Jeppesen Navigation Data

OBSTACLE DEPARTURE - An instrument departure procedure established to avoid obstacles.

PANS OPS - Procedures for Air Navigation Services - Aircraft Operations (ICAO)

QFE - Height above airport or runway, local station pressure.

QNH - Altitude above MSL, local station pressure

SENSOR FINAL APPROACH FIX (FF) - Included in database and on charts when no FAF is specified for the approach.

SID - Standard Instrument Departure

STAR - Standard Terminal Arrival Procedure

TERPs - United States Standard for Terminal Instrument Procedures

VNAV - Vertical Navigation

VERTICAL DESCENT ANGLE - May be established by Jeppesen or specified by the State (country). Charted on Jeppesen approach charts along with database identifiers and rates of descent

WGS-84 - World Geodetic System of 1984

END

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