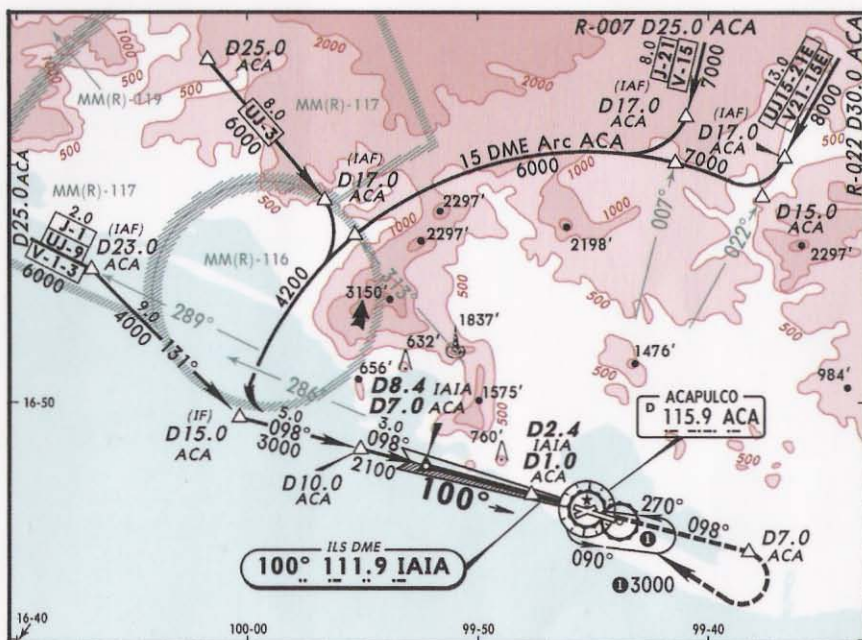




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INTRODUCTION TO JEPPESEN NAVIGATION CHARTS

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 V_{ref} , if specified, or if V_{ref} is not specified, $1.3 V_{SO}$ at the maximum certificated landing weight. V_{ref} , V_{SO} , 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:

CHART GLOSSARY

- 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 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.

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.

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).

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).

- AGL Altitude — Altitude expressed in feet measured above ground level (QFE).
- MSL Altitude — Altitude expressed in feet measured from mean sea level (QNH).
- 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

CHART GLOSSARY

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/fixtures. 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 —

- The intended direction of flight in the horizontal plane measured in degrees from north.
- The ILS localizer signal pattern usually specified as front course or back course.
- 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:

- Decision altitude (DA) is referenced to mean sea level (MSL) and decision height (DH) is referenced to the threshold elevation.*
- 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 T_i and T_t where:

- T_i — the earliest time at which a DCL service can be initiated;
- T_t — 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 acknowledgment procedure is T₃ where:

- T₃ — 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 — 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.

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,

- at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
- 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:
 - a landing can be made; or
 - 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.

- Flight Information Service (FIS) — A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.
- 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/glideslope is based on the following:

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

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.

- 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.
- 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) —

- 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).
- 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).
- ILS Category III (Special authorization required) —
 - 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).
 - 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).
 - IIIC — An ILS approach procedure which provides for approach with no decision height and no runway visual range limitations.
- 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.

CHART GLOSSARY

ILS CATEGORIES (USA) —

- 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.
- 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.
- ILS Category III —
 - 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.
 - 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.
 - 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:

- An airport of entry which has been designated by the Secretary of Treasury or Commissioner of Customs as an international airport for customs service.
- A landing rights airport at which specific permission to land must be obtained from customs authorities in advance of contemplated use.
- 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.

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.

- 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
- 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
- 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 enroute 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.

MISSSED APPROACH —

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

CHART GLOSSARY

MISSSED 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.

MISSSED 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:

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

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:

- 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
- 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.

- 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.
- 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 —

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

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 —

- 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.
- 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.
- Final Approach — That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.
- Missed Approach Procedure — The procedure to be followed if the approach cannot be continued.

USA —

- 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.
- Intermediate Approach — The segment between the intermediate fix or point and the final approach fix.
- Final Approach — The segment between the final approach fix or point and the runway, airport or missed approach point.
- 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:

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

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 race-track 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.

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 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 equalled 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.

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.

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 Helipoint
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

ABBREVIATIONS USED IN AIRWAY MANUAL

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

ABBREVIATIONS USED IN AIRWAY MANUAL

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

ABBREVIATIONS USED IN AIRWAY MANUAL

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

ABBREVIATIONS USED IN AIRWAY MANUAL

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

ABBREVIATIONS USED IN AIRWAY MANUAL

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

ABBREVIATIONS USED IN AIRWAY MANUAL

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

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.

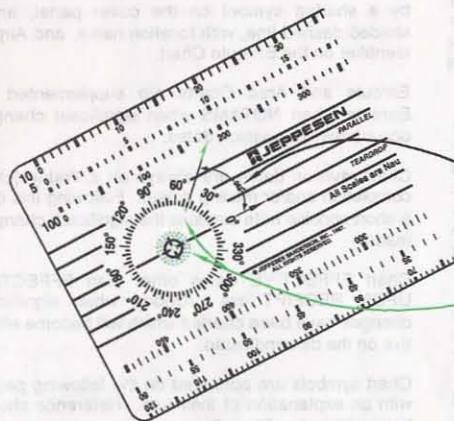
If the centerline arrow on the compass rose points OPPOSITE to the direction of flight, the radial or bearing is the reciprocal of the number read at the navaid's north magnetic tick.

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.

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 symbolology 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 TWBE); 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

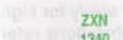


Bone Pattern

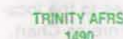


Fan Marker and NDB

BROADCAST STATION



Commercial



Armed Forces Radio Station

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 navaid. 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 navaid 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 navaid 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 navaid 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 navaid 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.

STOUT
D 114.1 STO

KADENA
D 112.0 KAD
N26 22.4 E127 48.0
335 KD
N26 20.0 E127 44.8

BENBECULA
D 114.4 BEN
(DME not Co-located)

MOODY
113.3 VAD
TAC-80

KENNEY
254 ENY

LIPTON
TAC-88 LPT
(114.1)

GRAND VIEW
D 115.4 GND

CLARKSVILLE ARK
135.481-45
201 CZE

LOC
108.7 IMBS

LAYTON

ATT 122.8/SNM
DRCO 125.7
CANADIAN INSET
LA SARRÉ QUE
CSB 1048-47

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 remotely located sites.

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

RIVER 122.1G
CANYON
113.9 CNY

RIVER 122.1G
DIAMOND
RIVER 122.6

122.2-122.4
TAPEATS
D 112.2 TPT

HIWAS
MIAMI WX *122.0
MIAMI
D 115.9 MIA
N25 57.8 W080 27.6

RIVER 122.3
PHANTOM 122.6
PHANTOM
364 PTM

FSS RIVER
LAVA
D 115.3 LVA

122.2 122.6 123.6 (LAA)
GRAND ARIZ
1285

AAS 123.6
NORTHSIDE
390

U-MF 122.8/10NM
NORTHSIDE
390

ATF MOOSE 123.6
NORTHSIDE
390

DENVER WX *122.0
DENVER
D 116.3 DEN
N39 51.6 W104 45.1

River Radio (R/V) 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 remotely located outlets. Service is not continuous.

ENROUTE CHART LEGEND

VIRAC
RADIO

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.

CRYSTAL
116.1 CRTSECTOR 2
MANILA
CONTROL
119.3 126.1
128.2 130.1

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.

BELGRADE
WX
126.40

Plain language inflight weather station with name and frequency.

ADELAIDE
124.3SOUTH EASTERN
RADIO
2869 4678
5526 8876

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

CENTER
SYDNEY
118.5 119.7
123.4 125.6RADIO
NASSAU
E CAR
124.2
5566 6537
8871 13344

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

ACC
TORONTO (R)
(LONDON)
119.4

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.

CHICAGO
121.4

NAVAID/COMMUNICATION DATA

(May be Shutdown)

(May be Test Only)

(May not be Comsd)

(TWB)
MAYBE
326 MBY

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

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

(WX)
EAST BAY
362 EZB

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

(R)

SAABERKEN
343 SRN

*

H + 04 & 15(1)

FOG:H + 02 & 08

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.

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.

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.

Country identifier, designation in parens, and number
Upper Limit
Lower Limit
Hours active
Controlling Agency (Limits may be tabulated)

CY(R)-4207
FL 450
GND
SS-SR
(MSP ARTCC)ED (R)-7
30000
GNDR-6001
24000
GND
(JAX ARTCC)

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.

ENROUTE CHART LEGEND

RESTRICTED AIRSPACE DESIGNATION

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

Canadian Alert Area Suffixes

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

AIRPORTS

Civil	Military	
IFR	VFR	
		Airports
		Seaplane Base
		Heliports
(LAA)		LAA Local Airport Advisory
(AFIS)		AFIS (Aerodrome Flight Information Service)
(ALA)		Authorized Landing Area
		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).
		Location name - VFR airport, no procedure published by Jeppesen. "s" indicates soft surface otherwise hard surface.

DENVER COLO
-Intl
KDN 5431-160

Tidjikla
GOND 1316-52s

AIRWAY AND ROUTE COMPONENTS

AIRWAY AND ROUTES CENTER LINES

Airway/Route
Diversionary Route
Overlying High Altitude Airway/Route
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.

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 removed.

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

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.

Fix formed by 55 DME from MAZ navaid.

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

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

DOM F-(suffix) Advisory service only
DOM-Domestic Route. Use by foreign operators requires special authorization.

G-Green, Golf
G-(suffix) Flight Information only

G 78 GR-Gulf Route
H or HL-High Level
J-Jet

L-(suffix) L/MF airway
NAT-Route associated with the North Atlantic Organized Track structure.

NAT OTR-Oceanic Transition Route
PDR-Predetermined Route

R 11 R-Red, Romeo

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

UL 5 U-Upper
UL-(prefix) RNAV route

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

A 5 One Way Airway

UL 7123
L 711
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.

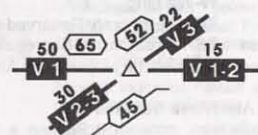
7500G GPS MEA

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°
137°T
VOR radial & route bearings (magnetic)

VOR Radial and route bearings (true)

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

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.

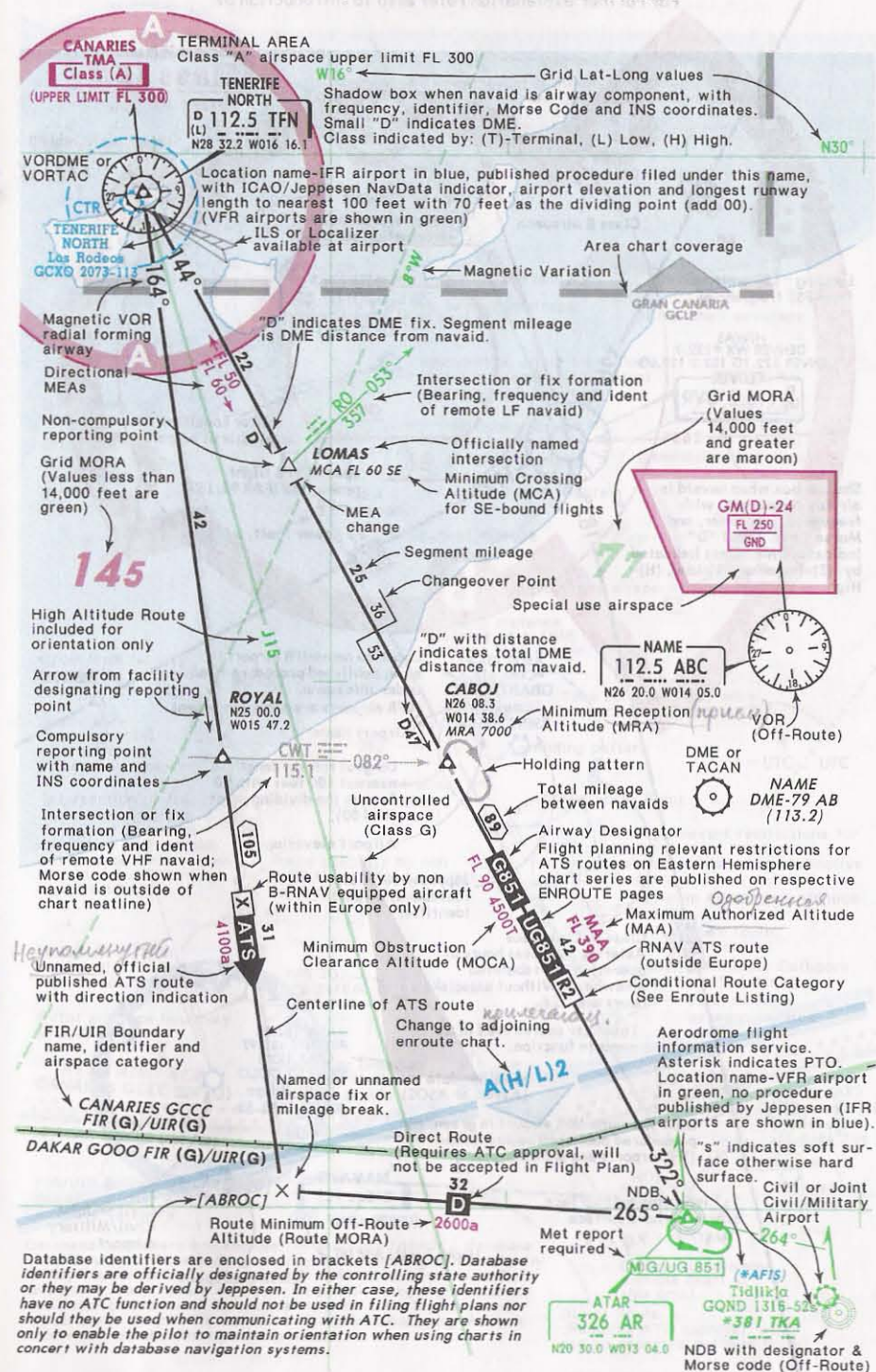
Means even thousands altitudes/flight levels are used in the direction of the arrow and odd thousands in the opposite direction. For application of this symbol above FL 290, the left half of the cruising level rose is considered even. The symbol is shown where altitude/flight level assignment is opposite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

Means all altitudes, even and odd, are available in the direction indicated.

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.

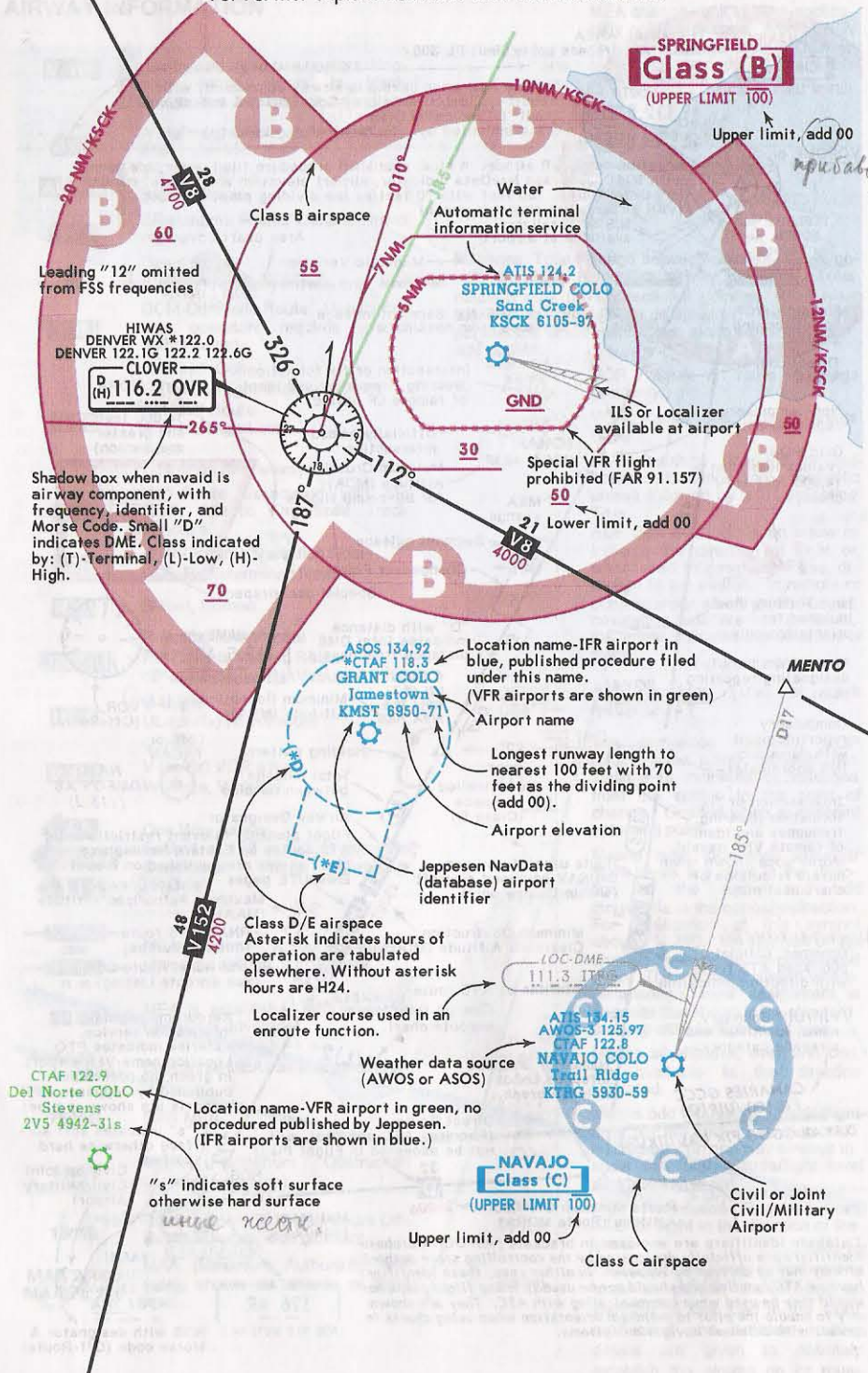
Prior Permission Required for ATC for flight in the direction of the arrow.

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.

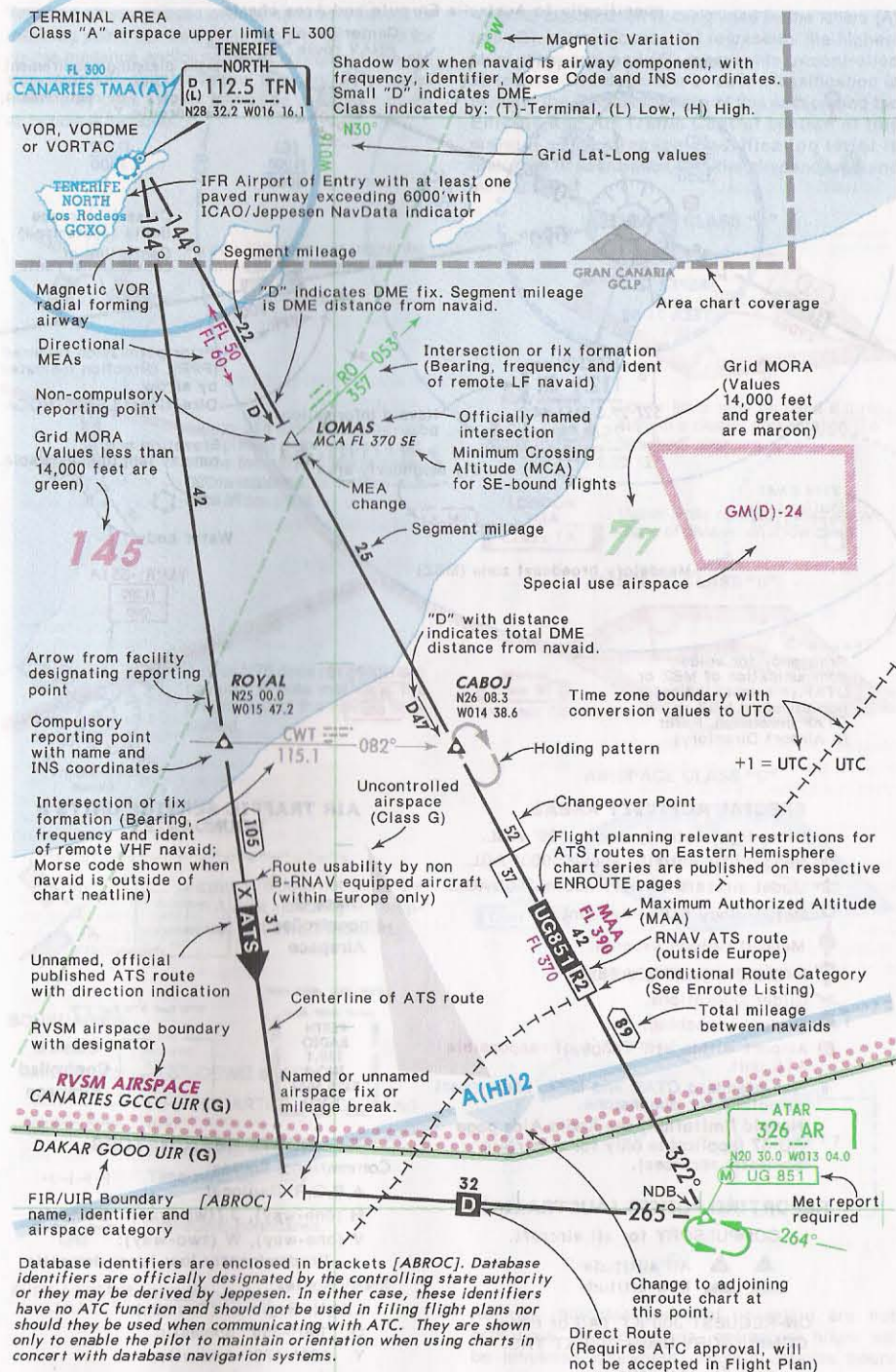
ENROUTE CHART LEGEND
LOW & HIGH/LOW ALTITUDE CHART LEGEND

UNITED STATES LOW ALTITUDE ENROUTE & AREA CHART LEGEND

For Further explanation refer also to Introduction 57



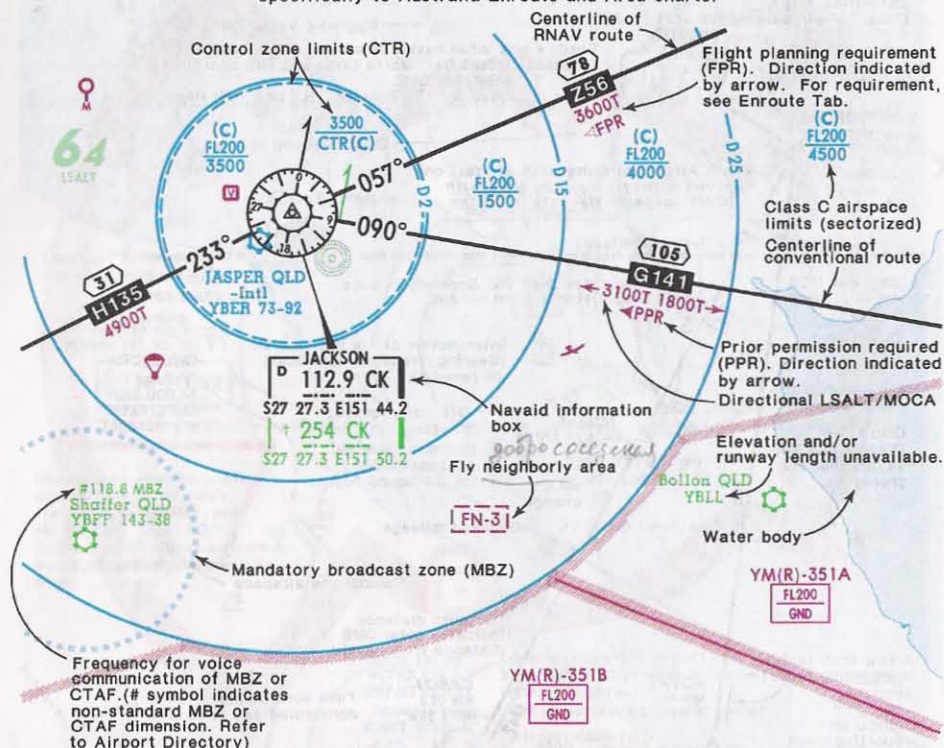
ENROUTE CHART LEGEND HIGH ALTITUDE ENROUTE CHART LEGEND



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

FIG
BRISBANE
CENTER
(SPRINGBROOK)
130.4

PERTH
RADIO
118.1
INO-1
3476 5634
17061

FIG
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

ENROUTE CHART LEGEND

AIRWAY NAVAID/REPORTING POINT BY-PASS

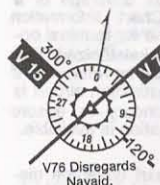
When an airway passes over or turns at a navaid or reporting point, but the navaid is not to be utilized for course guidance and/or no report is required, the airway centerline passes around the symbol. In cases where a by-pass symbol cannot be used, an explanatory note is included.



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 navaid. A note indicating the proper use of the navaid is included.

BOUNDARIES

- ADIZ, DEWIZ and CADIZ
- FIR, UIR, ARTCC or OCA boundary.
- International boundary.
- Time zone boundary.
- QNH/QNE-boundaries.

RVSM AIRSPACE 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"



STAVANGER
UTA
Class (A)
(LOWER LIMIT FL195)

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

LONDON
TMA
Class (A)

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

AIRSPACE CLASS "B"



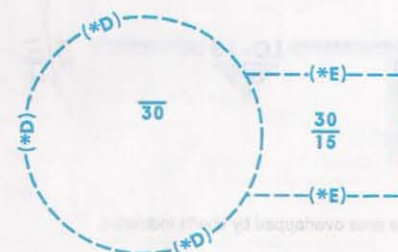
DENVER
Class (B)
(UPPER LIMIT T00)

AIRSPACE CLASS "C"



FRANKFURT
TMA
Class (C)

AIRSPACE CLASS "D & E"

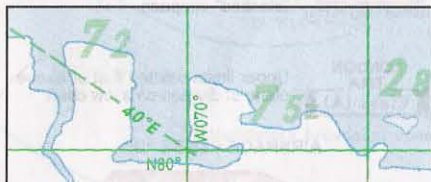


Asterisk indicates hours of operation are not continuous. In such cases, operational hours will be tabulated elsewhere. Without asterisk hours are H24.

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.

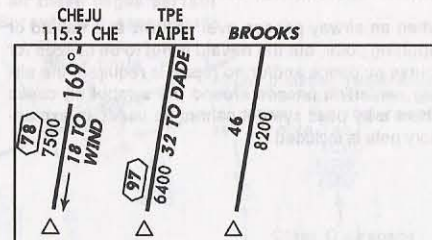
Shorelines and large inland lakes are shown.

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.

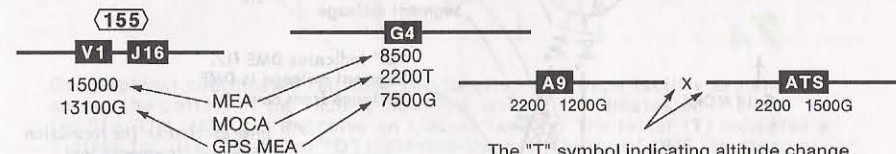
Reference number for INS Coordinates. These coordinates are tabulated elsewhere on the chart and identified in a like manner.



ENROUTE CHART LEGEND

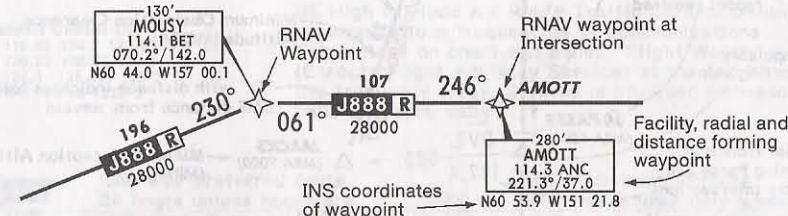
U.S. GPS MEAs

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.



The "T" symbol indicating altitude change applies to conventional MEAs only. It does not apply to GPS MEAs change.

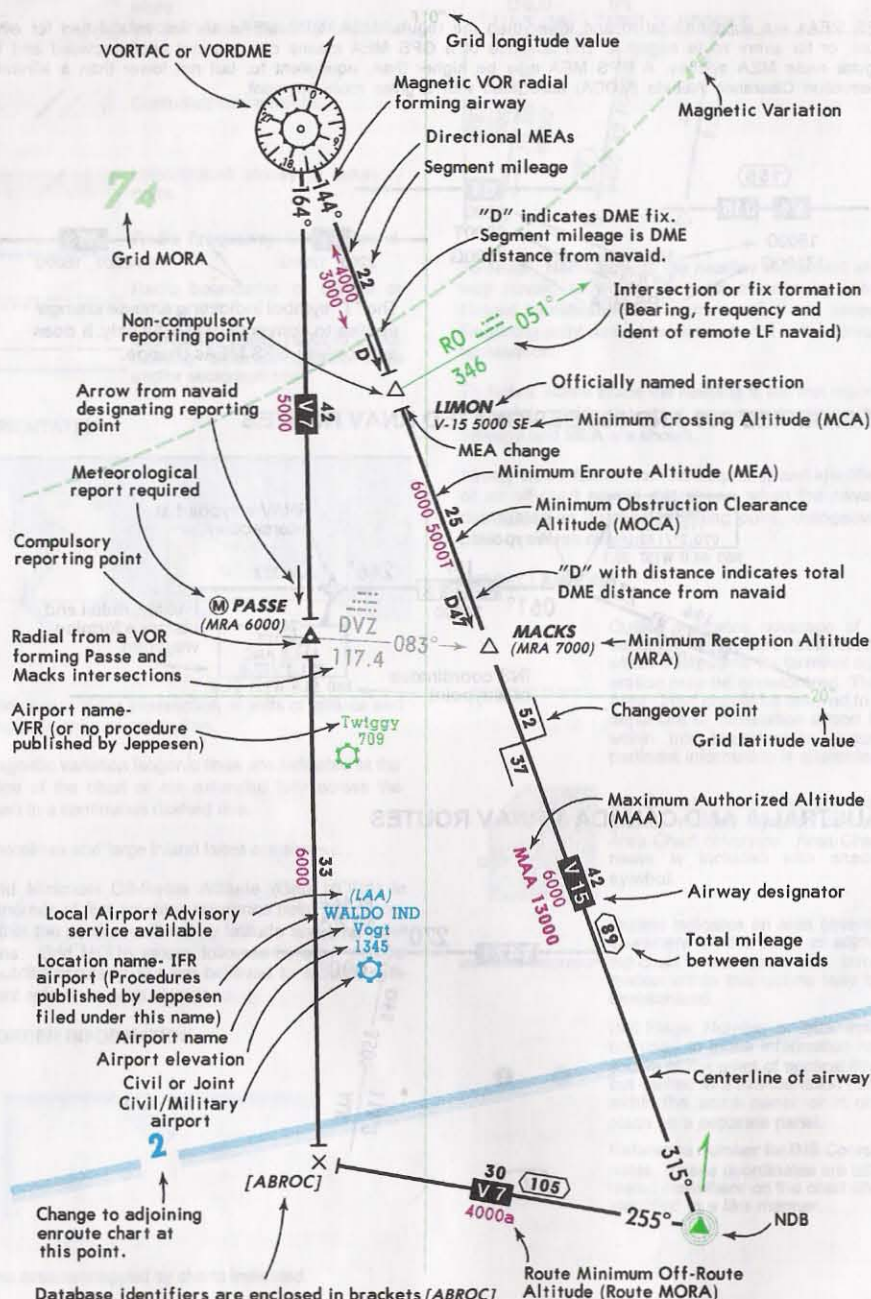
U.S. SERIES 800 AND 900 DESIGNATED RNAV ROUTES



AUSTRALIA AND CANADA T RNAV ROUTES



ENROUTE CHART LEGEND

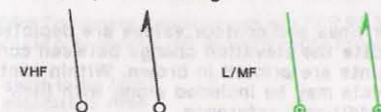


Database identifiers are enclosed in brackets [ABROC]. Database identifiers are officially designated by the controlling state authority or they may be derived by Jeppesen. In either case, these identifiers have no ATC function and should not be used in filing flight plans nor should they be used when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

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.

ALAMOSA
D 113.9 ALS
N37 20.9 W105 40.9

TERPS
(H) 117.4 TPS
N30 39.0 W093 45.4

RIVER
(L) 116.3 RER
N29 17.0 W089 40.3

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.

J60
(1500-
0300 UTC)

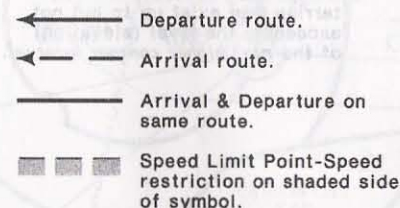
One-way preferred route
24 hours unless hours are
indicated. Two-way during
other hours.

25000
FL 250

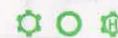
MEA (Minimum Enroute
Altitude) shown only when
higher than floor of the
high altitude structure.

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.



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

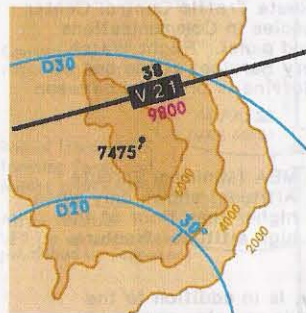
ENROUTE CHART LEGEND AREA CHRTS (Continued)

GENERALIZED TERRAIN CONTOURS

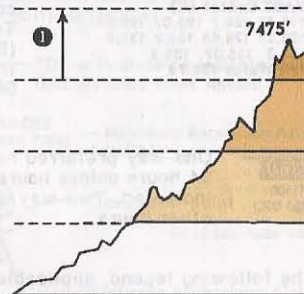
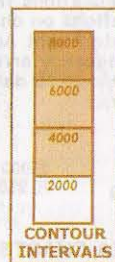
Terrain information may be depicted on area charts when terrain within the area chart coverage rises more than 4000 feet above the main airport.

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 terrain or structures.



DME arcs are included for situational awareness.



① Within each contour interval, terrain may exist up to but not exceeding the level (elevation) of the next higher contour interval.

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).

CLASS (B)

10-1A

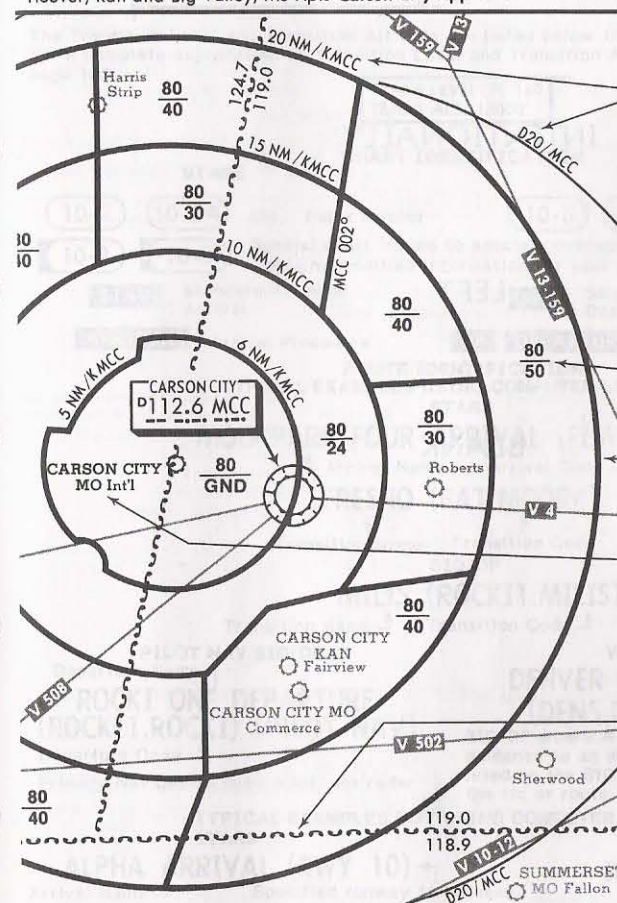
CARSON CITY, MO

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.

Additional information or instructions.

RULES AND PILOT AND EQUIPMENT REQUIREMENTS
91.215

FLIGHT PROCEDURES

Class B airspace are required to operate in accordance with current

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'

STARS

CHART IDENTIFICATION

SIDS/DPs

10-2 **10-2A**, etc. Index number **10-3** **10-3A**, etc. Index number

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

STAR Standard Terminal
Arrival

SID Standard Instrument
Departure

ARRIVAL Arrival Procedure

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 (ROCK11.MILIS)

Transition Name Transition Code

PILOT NAV SID/DP

Departure Name

**ROCKI ONE DEPARTURE
(ROCK11.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

INDIA DEPARTURE

Departure Name

RUNWAY 13 DEPARTURE

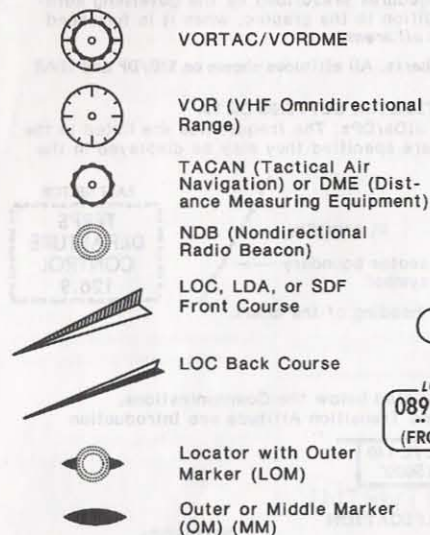
Database identifier are included when different than the name or computer code. The database identifier is enclosed in brackets.

**POGO NORTH 7X DEPARTURE
[POGN7X]**

SID/DP AND STAR LEGEND GRAPHIC

(Charts are not drawn at a specific scale)

RADIO SYMBOLS



RADIO IDENTIFICATION

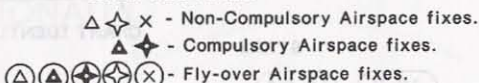
DENVER
D (H) 116.3 DEN
N39 51.6 W104 45.1

PRACHINBURI
201 PB
N14 06.0 E101 22.0

LOC
108.7 IMBS

LOC (BACK CRS)
089° 109.7 IMEX
(FRONT CRS 269°)

AIRSPACE FIXES



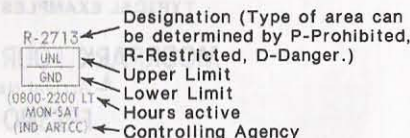
VERTICAL NOISE ABATEMENT PROCEDURES

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

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

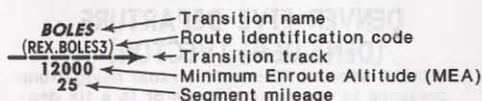
RESTRICTED AIRSPACE

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.

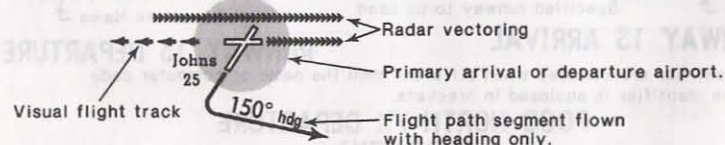


ROUTE PORTRAYAL

SID/DP and STAR Track



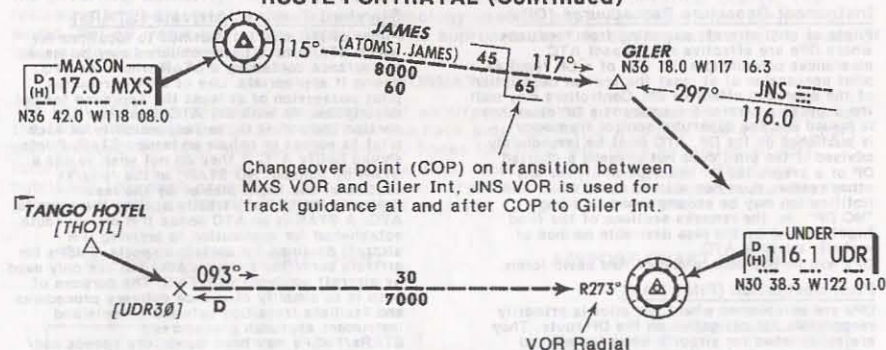
DF 11
SID/DP or STAR label of a particular route in some coverage areas



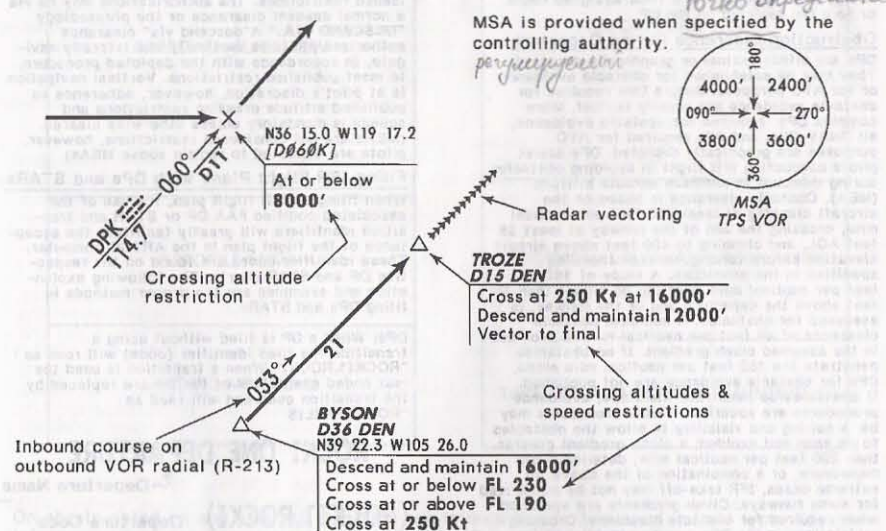
Navaid identification is given in shadow box with frequency, identifier, Morse Code and latitude & longitude coordinates. DME capability is indicated by a small "D" preceding the VOR frequency at frequency paired nav aids. VOR and VORTAC facility operational ranges are identified (when known) within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

Localizer nav aids 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.

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



Database identifiers are enclosed in brackets [UDR30]. 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.

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

Climb gradient

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).

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

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



Arrival/departure airport, highlighted with circular screen.

SID, DP AND STAR LEGEND

PROCEDURE APPLICABLE TO USA FAA ONLY

Instrument Departure Procedures (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:

- Determine whether a DP is available for obstacle avoidance;
- Determine if obstacle avoidance can be maintained visually or that the DP should be followed; and
- 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 facilitate transition between enroute and instrument approach procedures.

STARs/FMSPs may have mandatory speeds and/or crossing altitudes 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 "ROCK11.ROCK1". When a transition is used the last coded characters of the DP are replaced by the transition code and will read as "ROCK11.MILIS".

ROCK ONE DEPARTURE

	Departure Name
(ROCK11.ROCK1)	Departure Code
MILIS	Transition Name
(ROCK11.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

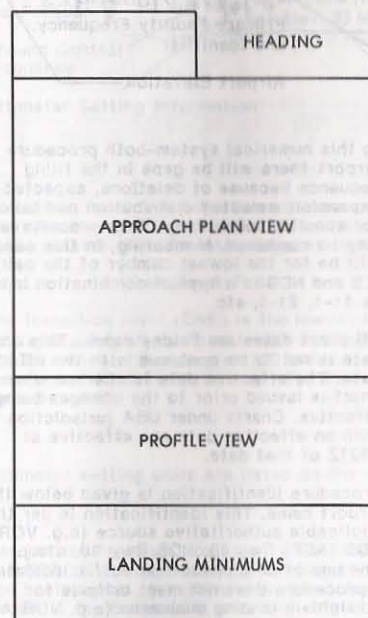
APPROACH CHART LEGEND

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.

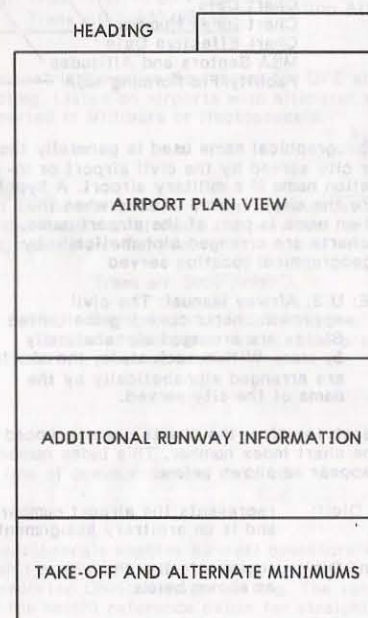
FORMATS

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

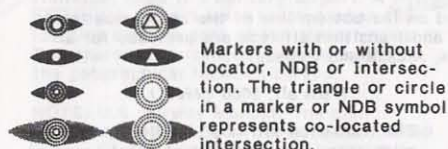


On charts dated on and after 10 MAR 95, key information is displayed in bold type. Key information includes Communication frequencies, Primary NAVAID frequency and identifier, Procedure bearings and Altitudes, Airport and runway end elevation, Decision Altitude and Minimum Descent Altitude, and Missed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

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



TERPS
P115.4 TRP

THORNTON
281 TOT

TERPS
D(H)115.4 TRP

SAARBRUCKEN
343 SBN

(OP NOT CONT)
or *

TACAN-112
CUSTARD
P(116.5) CUS

Domestic DME
BIBOOHRA
Ch 4 BIB

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.

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 DME
257° 110.3 IDEN

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

LOC (BACK CRS)
077° 110.3 IDEN
(FRONT CRS 257°)

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

MLS DME
035° Ch 516 MTRP
P(109.7)

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

BEARINGS

106° → Magnetic course
106°T → True course

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

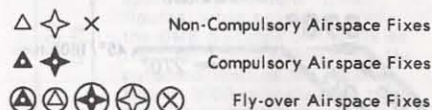
Morse code ident is charted on VOR radial/NDB bearing when forming facility is outside of planview.

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.

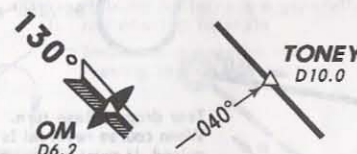
RADAR required.
Use ITRP ILS DME when on LOC course.
Pilot controlled lighting.

APPROACH CHART LEGEND APPROACH PLAN VIEW (continued)

AIRSPACE FIXES

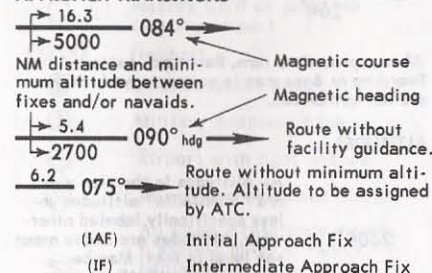


DME value will be portrayed as D10.0. When fix and co-located navaid names are the same, only the navaid name is displayed.



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

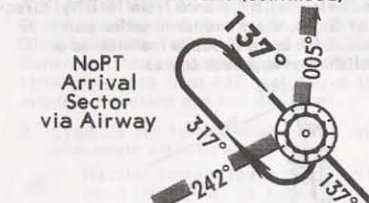


No procedure turn, Race Track Pattern or any other type of course reversal procedure required or authorized without ATC clearance.
Flag notes - see applicable reference notes elsewhere on the plan view.

Cross at FL 110 and descend to 3000'
WAKER
Crossing altitude and descent instructions.

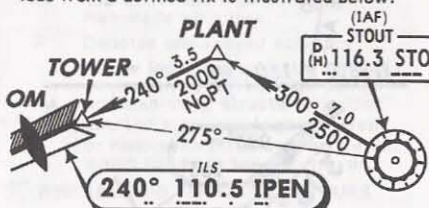
TERPS VOR
26.8 196° 2900
NOT TO SCALE
JOHNS
Approach transition inset. (Dog leg route, with off-chart turn). Also provided when route originates at an off-chart intersection designated only for approach use - such fixes are not charted on enroute and area charts.

APPROACH TRANSITIONS (continued)

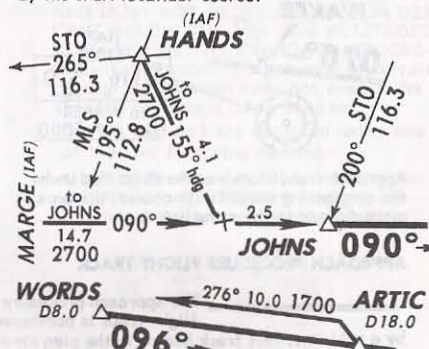


NoPT arrival sectors depict an area of approach transition routing to an approach fix. No procedure turn, Race Track Pattern or any type course reversal is required nor authorized without ATC clearance when an arrival course is within the charted sector and on an established airway radial to the fix.

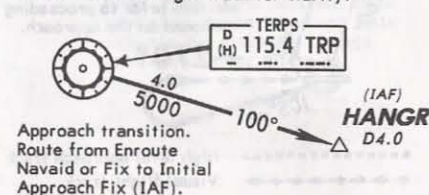
Approach transition track, distance, and altitude from a defined fix is illustrated below.



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.



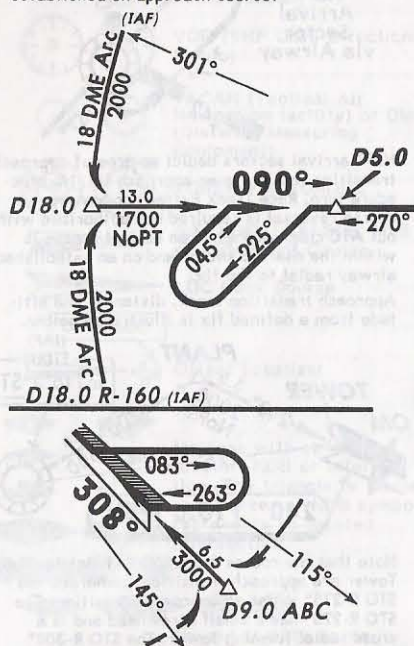
An approach transition coincidental with the approach procedure flight track is charted offset from the flight track for clarity.



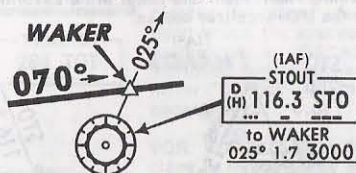
APPROACH CHART LEGEND APPROACH PLAN VIEW (continued)

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.



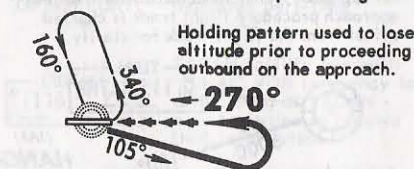
Lead radials may be provided as an advisory point for turning to the approach course.



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

APPROACH PROCEDURE FLIGHT TRACK

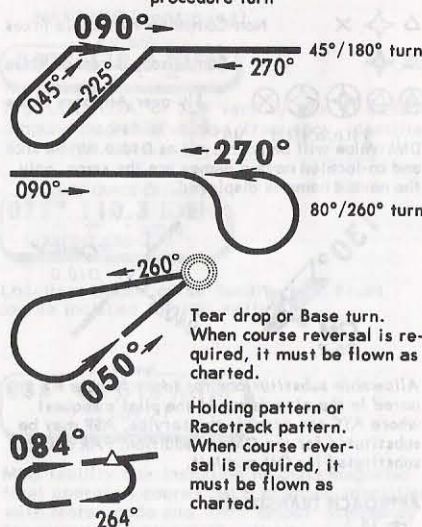
The approach procedure flight track is portrayed by a bold line. This track begins in the plan view at the same location where the profile begins.



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".

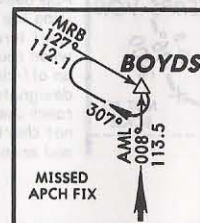
RECOMMENDED
2000'

Recommended altitudes are labeled "RECOMMENDED".

MISSED APPROACH

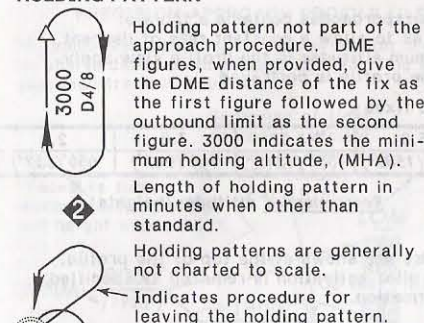
Initial maneuvering course for missed approach. Details of the missed approach are specified below the profile diagram.

Missed approach fix inset.



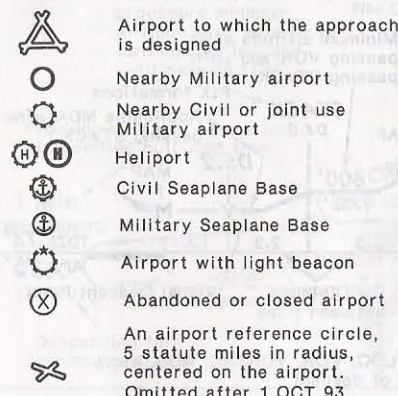
APPROACH CHART LEGEND APPROACH PLAN VIEW (continued)

HOLDING PATTERN



AIRPORTS

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

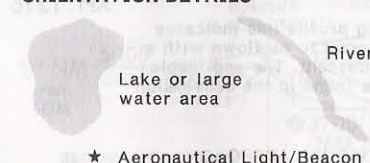


AIRSPACE

R-2402 Restricted airspace (Refer to the enroute chart for limitations.)

PROHIBITED AREA
SC(P)-23

ORIENTATION DETAILS



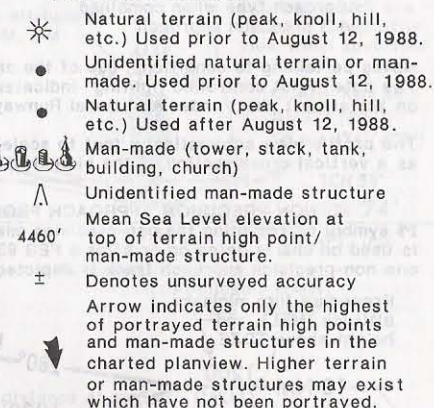
TERRAIN HIGH POINTS AND MAN-MADE STRUCTURES

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

TERRAIN HIGH POINTS AND MAN-MADE STRUCTURES (continued)

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.

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



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:

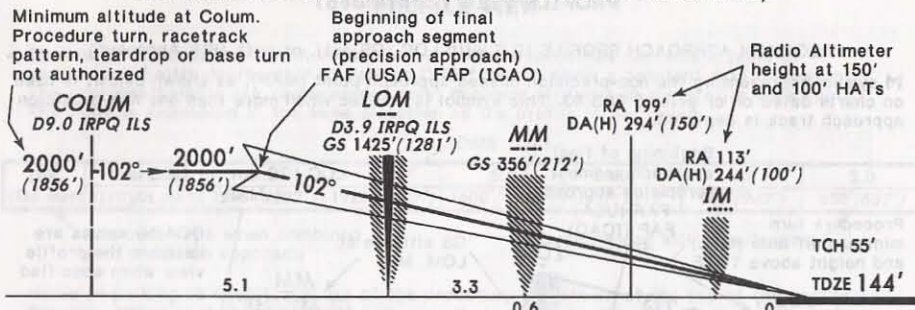
a) Prior to June 24, 1994, terrain information was depicted as gray contour lines with contour values.



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.



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 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** Visual Descent Point (VDP) (if specified by State source)
- D1.0** Begin missed approach procedure.
- 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.

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.
- TDZE 74'** Touchdown Zone Elevation. (Runway End or Threshold Elevation when labeled RWY).
- APT. 75'** Official Airport Elevation
- 10 NM 1200' (1126')** 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.
- 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**
- CHIPS** NoPT procedure flight track
- 3500' (3280')** Minimum altitude at fix.
- 10 NM 3000' (2780')** Flight tracks when procedure turn is used

- 1 Min 080° → 260° 2000' (1900')** 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.**
- 2 Min 1500' (1475') 156° 1300' (1275')** When airspeeds are indicated in profile note, higher airspeeds require shortened times to assure remaining in the protected area.
- VOR 336° 3000' (2975')** Radar required.
- Procedure based on 120 KT TAS.**
- 120°** Radar 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.**
- 035°** MLS glide path with inbound magnetic final approach course.

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 Sld.....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" condition.

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

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						90	
B	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	120
C							140
D				RVR 40 or 3/4	RVR 40 or 3/4	RVR 60 or 1 1/4	165
							560' (533') - 1
							560' (533') - 1 1/2
							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						90
B						120
C	RVR 18 or 1/2	RVR 24 or 1/2	RVR 40 or 3/4	RVR 24 or 1/2	RVR 50 or 1	140
D				RVR 40 or 3/4	RVR 60 or 1 1/4	165
						560' (533') - 1
						560' (533') - 1 1/2
						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			Max Kts	MDA(H)
A						100	
B	RVR 550m	RVR 720m	1200m	RVR 720m VIS 800m	RVR 1500m VIS 1600m	135	560' (533') - 1600m
C	VIS 800m	VIS 800m				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.

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.

STRAIGHT-IN LANDING RWY 36R				CIRCLE-TO-LAND	
ILS		LOC (GS out)			
DA(H) 227' (200')		MDA(H) 440' (413')			
FULL	ALS out		ALS out	Max Kts	MDA(H)
A				100	
B				135	560'(533') - 1600m
C	800m	1200m	RVR 1500m VIS 1600m	180	630'(603') - 2800m
D		1200m	2100m	205	730'(703') - 3600m

RVR and visibility values are the same

RVR and visibility values are not the same

Format for ILS CAT II

STRAIGHT-IN LANDING RWY CAT II ILS	
RA DA(H)	RA DA(H)

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).

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
Descent rate D7.0 to D3.0	466	600	667	800	934	1067
MAP at D1.5						

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

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

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						

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

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.

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.

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

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

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.

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

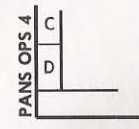
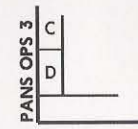
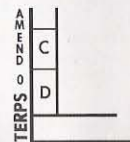
INSTRUMENT APPROACH PROCEDURE DESIGN INDICATOR PANS-OPS or TERPS

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.

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)

CIRCLE-TO-LAND	
Max Kts	MDA(H)
90	560'(553')-1
120	560'(553')-1 1/2
140	560'(553')-1 1/2
165	580'(573')-2

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

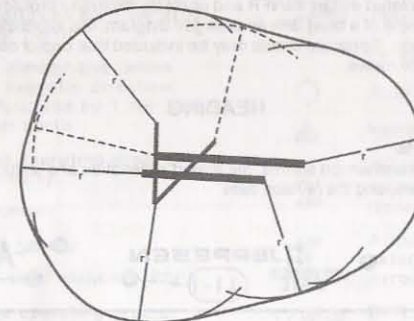
CIRCLE-TO-LAND	
Max Kts	MDA(H)
100	560'(553')-1600m
135	560'(553')-1600m
180	630'(603')-2800m
205	730'(703')-3600m

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.

CIRCLE-TO-LAND (TERPS)	
Max Kts	MDA(H)
90	560'(553')-1
120	560'(553')-1 1/2
140	560'(553')-1 1/2
165	580'(573')-2

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

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)

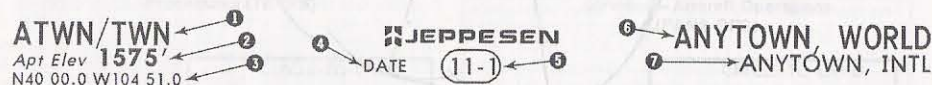
APPROACH CHART LEGEND AIRPORT CHART FORMAT

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 Revision 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)	UNICOM	NAMED Center (R)
VOT 127.75 VOT 112.0	121.9		131.97	120.1	001°-180° 126.55 181°-360° 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.

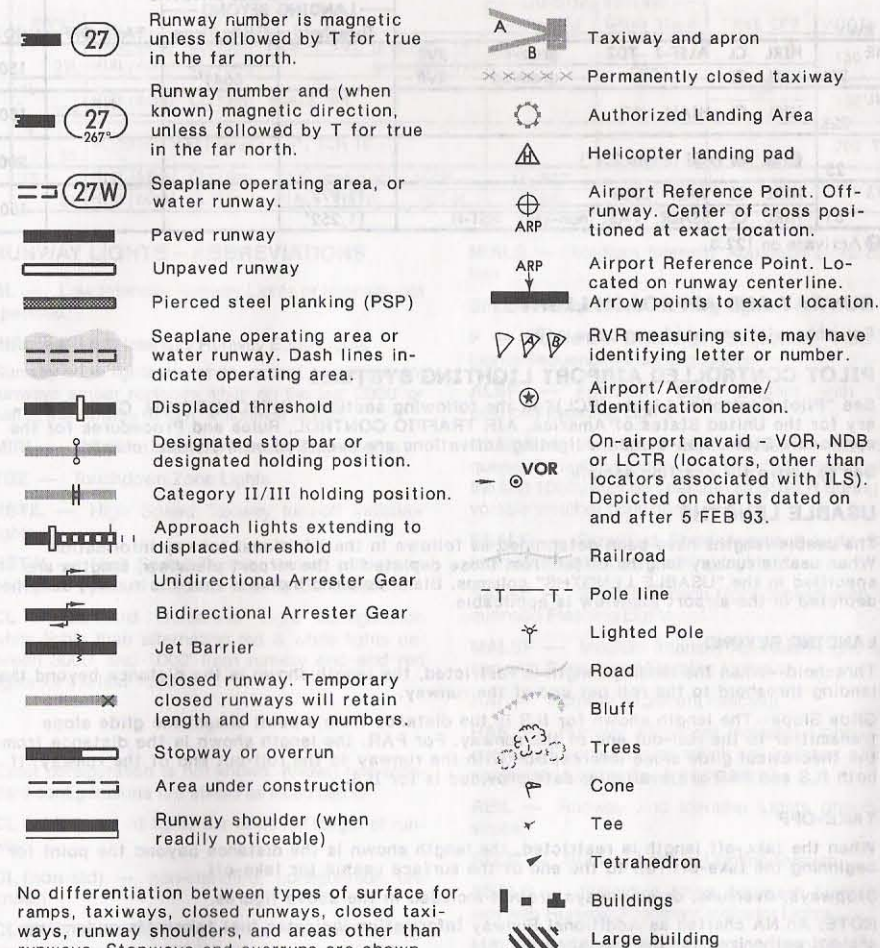
2 An asterisk (*) indicates part-time operation.

3 Radar is available

APPROACH CHART LEGEND AIRPORT PLAN VIEW

SYMBOLS

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



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.

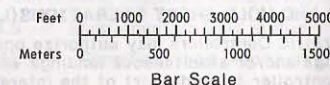
ADDITIONAL INFORMATION

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.



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 angles 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).

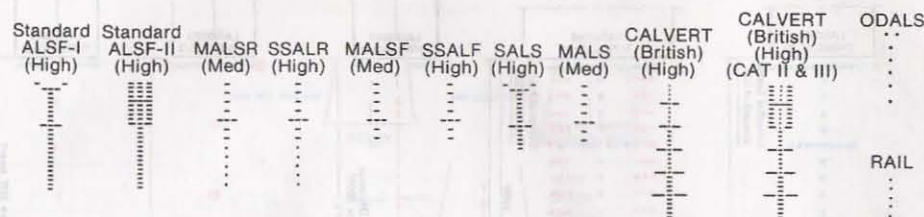
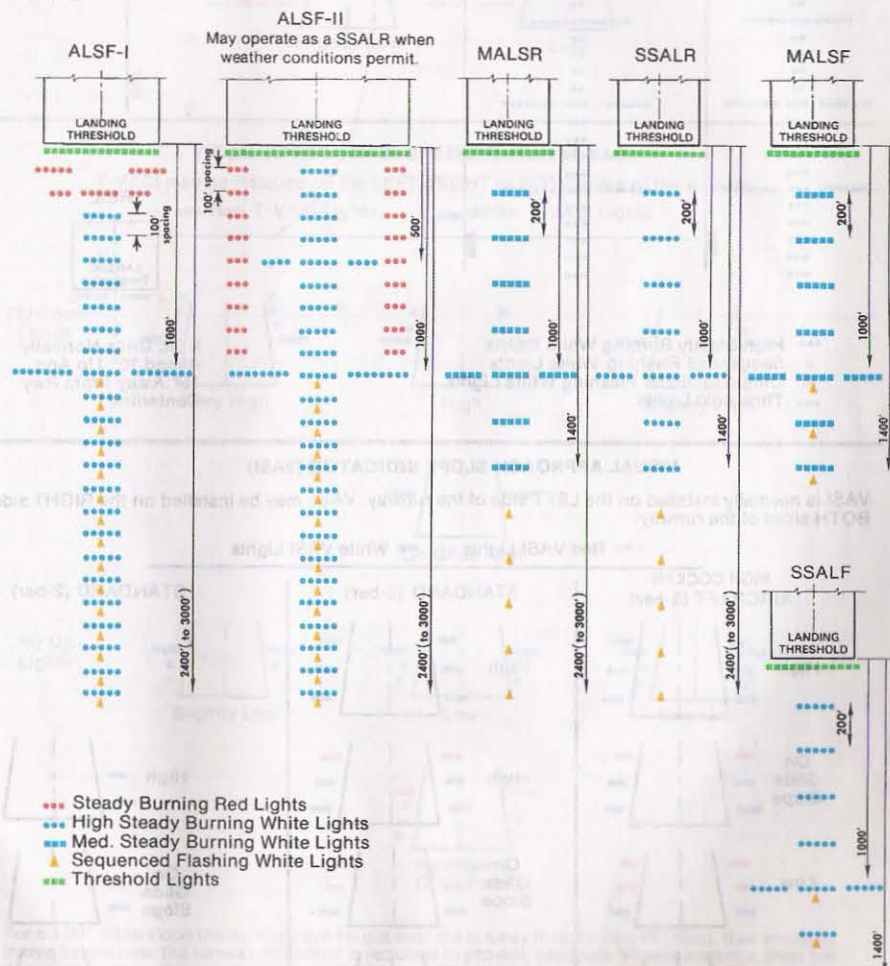
TCH — Threshold Crossing Height. Height of the effective visual glide path over the threshold.

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.

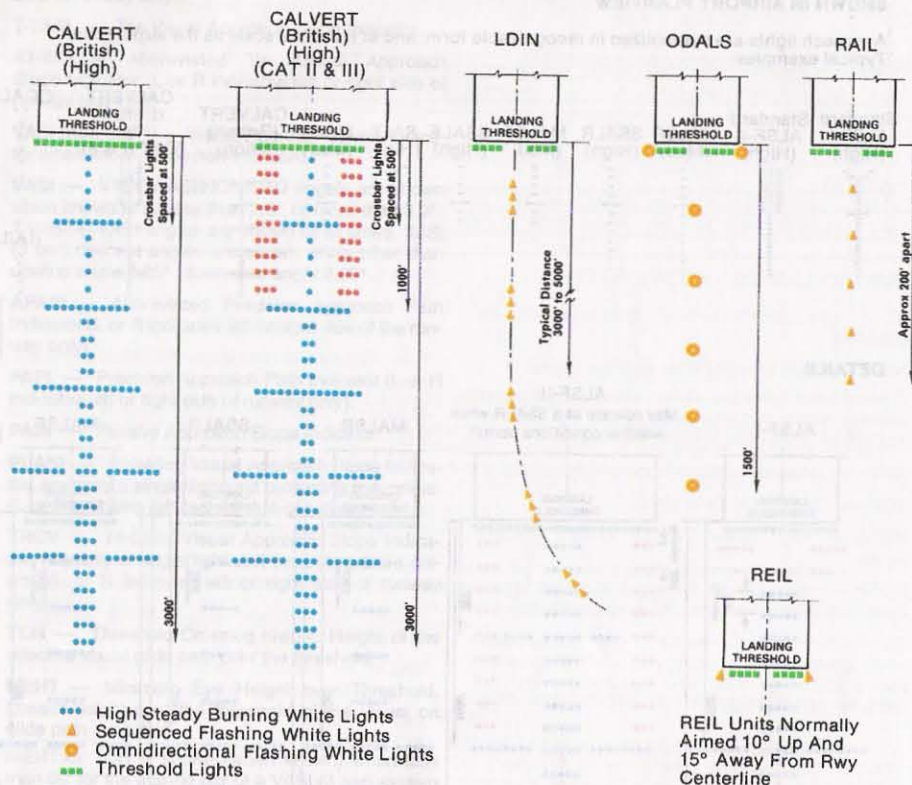
**APPROACH CHART LEGEND
LIGHTING SYSTEMS****SHOWN IN AIRPORT PLANVIEW**

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

**DETAILS**

APPROACH CHART LEGEND LIGHTING SYSTEMS (continued)

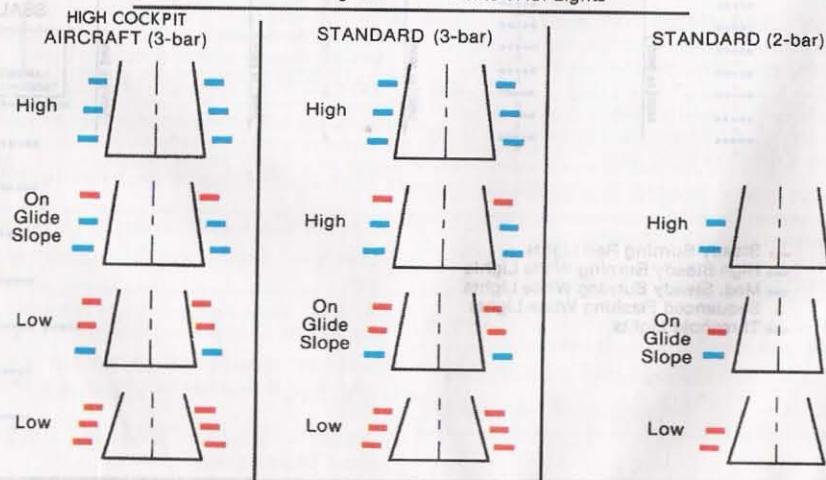
DETAILS (Continued)



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.

— Red VASI Lights — White VASI Lights

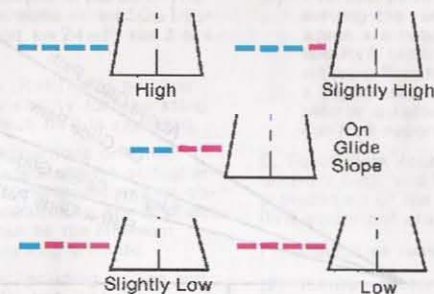


APPROACH CHART LEGEND LIGHTING SYSTEMS (continued)

PRECISION APPROACH PATH INDICATOR (PAPI)

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

— Red PAPI Lights — White PAPI Lights

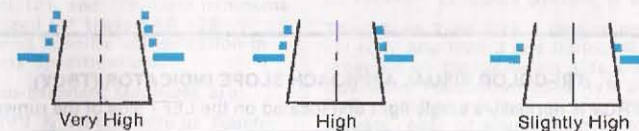


VISUAL APPROACH SLOPE INDICATOR (T-VASI)

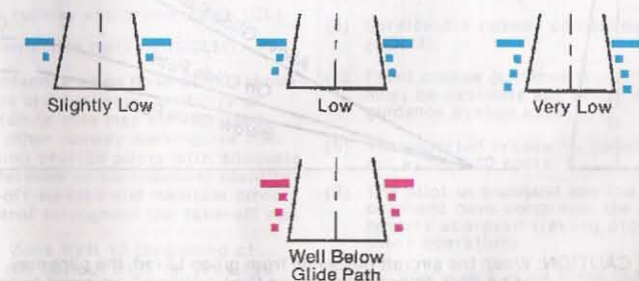
T-VASI may be installed on the LEFT, RIGHT or BOTH sides of the runway.

— Red T-VASI Lights — White T-VASI Lights

Fly Down Lights



Fly Up Lights

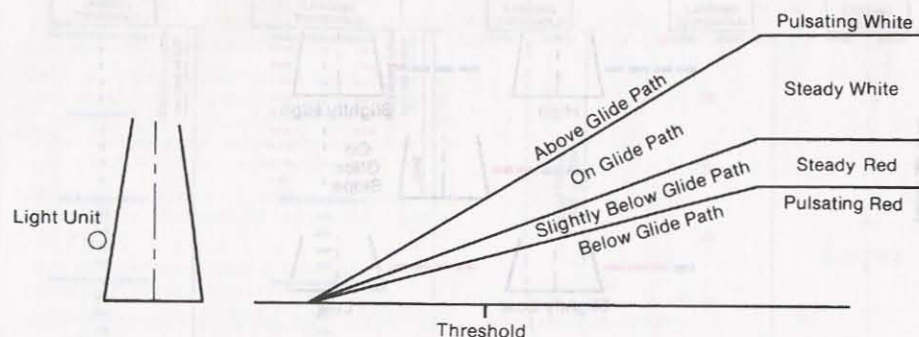


For a 3.00° glide slope the nominal eye height over the runway threshold is 49' (15m). If an increase in eye height over the runway threshold is required to provide adequate wheel clearance, then the approach may be flown with one or more fly down lights visible.

APPROACH CHART LEGEND LIGHTING SYSTEMS (continued)

PULSATING VISUAL APPROACH SLOPE INDICATOR (PLASI)

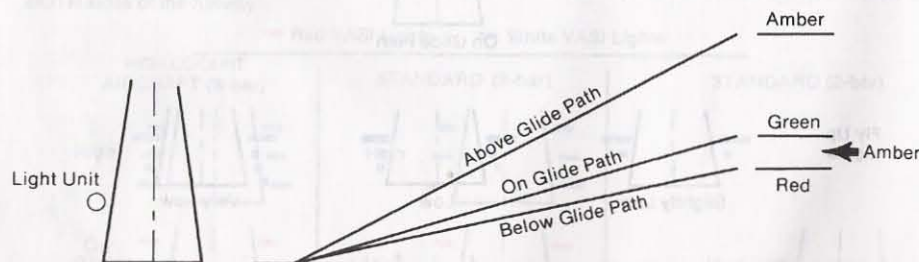
PLASI is normally a single light unit located on the LEFT side of the runway.



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.

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 1/2 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 RVR 1/4 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 RVR 1/4 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.

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 RVR $\frac{1}{2}$ 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.

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.

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 $\frac{1}{2}$ 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.

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									
Rwys 11R, 29L				Rwys 4, 11L, 22, 29R				FOR FILING AS ALTERNATE	
(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 Min climb of 290'/NM to 1000'	Adequate Vis Ref	STD	Other	
1 & 2 Eng	TDZ RVR 3	TDZ RVR 5	RVR 16 or $\frac{1}{4}$	RVR 50 or 1	RVR 16 or $\frac{1}{4}$	RVR 50 or 1	RVR 24 or $\frac{1}{2}$	300- RVR 50 or 1	A Precision B 600-2 C 700-2 D
3 & 4 Eng	Mid RVR 3	Mid RVR 5	RVR 16 or $\frac{1}{4}$	RVR 50 or 1	RVR 16 or $\frac{1}{4}$	RVR 50 or 1	RVR 24 or $\frac{1}{2}$		Non-Precision 800-2
	Rollout RVR 3	Rollout RVR 5							

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 $\frac{1}{2}$ 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).

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 visibility 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 columns for the procedure.

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

TAKE-OFF					
AIR CARRIER			AIR CARRIER (FAR 121)		
LVP must be in Force			Rwys 07, 08, 25, 26		
Rwys 07, 08, 25, 26	ALL Rwys	ALL Rwys	CL & RCLM any RVR out, other two req.	Adequate Vis ref	Rwys 02L, 20R Adequate Vis ref
RL & CL	RCLM (DAY only) or RL	RCLM (DAY only) or RL			
A 200m (150m)	250m	400m	2 Eng TDZ RVR 150m	RVR 500m	RVR 500m
B			Mid RVR 150m	VIS 400m	VIS 400m
C			3 & 4 Eng Roll out RVR 150m		
D 250m (200m)	300m				

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 $\frac{1}{4}$)] 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.

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	Alternate Airport IFR Weather Minimums Visibility
For airports with at least one operational navigational facility providing a straight-in non-precision 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 ½ SM 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.

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.

CHARTED HAT	CHARTED ALTERNATE CEILING	CHARTED ALTERNATE VIS	CHARTED HAT	CHARTED ALTERNATE CEILING	CHARTED ALTERNATE VIS
1000	1000	1.0	1000	1000	1.0
900	900	1.0	900	900	1.0
800	800	1.0	800	800	1.0
700	700	1.0	700	700	1.0
600	600	1.0	600	600	1.0
500	500	1.0	500	500	1.0
400	400	1.0	400	400	1.0
300	300	1.0	300	300	1.0
200	200	1.0	200	200	1.0
100	100	1.0	100	100	1.0
0	0	1.0	0	0	1.0
1000	1000	1.0	1000	1000	1.0
900	900	1.0	900	900	1.0
800	800	1.0	800	800	1.0
700	700	1.0	700	700	1.0
600	600	1.0	600	600	1.0
500	500	1.0	500	500	1.0
400	400	1.0	400	400	1.0
300	300	1.0	300	300	1.0
200	200	1.0	200	200	1.0
100	100	1.0	100	100	1.0
0	0	1.0	0	0	1.0

A straight-in may be used if a HAT/HAA is shown.

Along-track Distance (ATD) by Time A/D
is an along-track distance shown in a
distance in feet with reference to the first
waypoint.

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			METRIC	
		CHARTED VIS	ALTERNATE VIS	CHARTED VIS	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

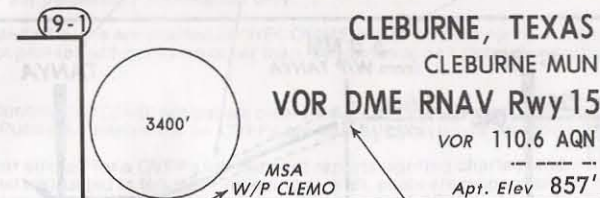
CHARTED HAT	ALTERNATE CEILING			METRIC	
		CHARTED VIS	ALTERNATE VIS	CHARTED VIS	ALTERNATE VIS
200	400	1/2	1	800 M	1.6 Km
201-300	500	3/4	1 1/4	1200 M, 1.2 Km	2.0 Km
301-400	600	1	1 1/2	1600 M, 1.6 Km	2.4 Km
401-500	700	1 1/4	1 3/4	2000 M, 2.0 Km	2.8 Km
501-600	800	1 1/2	2	2.4 Km	3.2 Km
601-700	900	1 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

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

850°-09°E
ACTON
D 110.6 AQN
N32 26.1 W097 39.8

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.

RISZO
EWO
257.9°/19.8
N37 34.1 W086 04.9

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

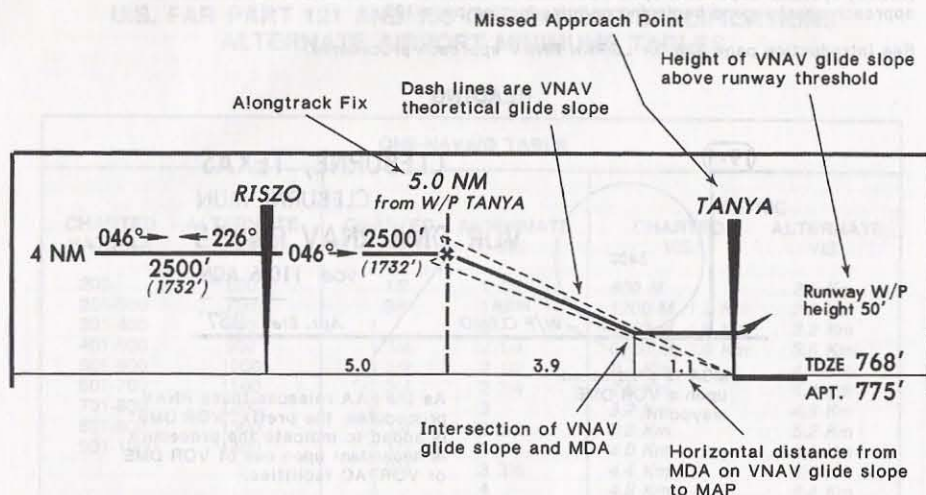


A waypoint may be located at a VORTAC or VOR DME.

5.0 NM
from W/P TANYA

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

PROFILE VIEW



CONVERSION TABLE

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

Missed Approach Point

VNAV glide slope setting

Rates of descent on VNAV glide slope

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. Nav aids 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.

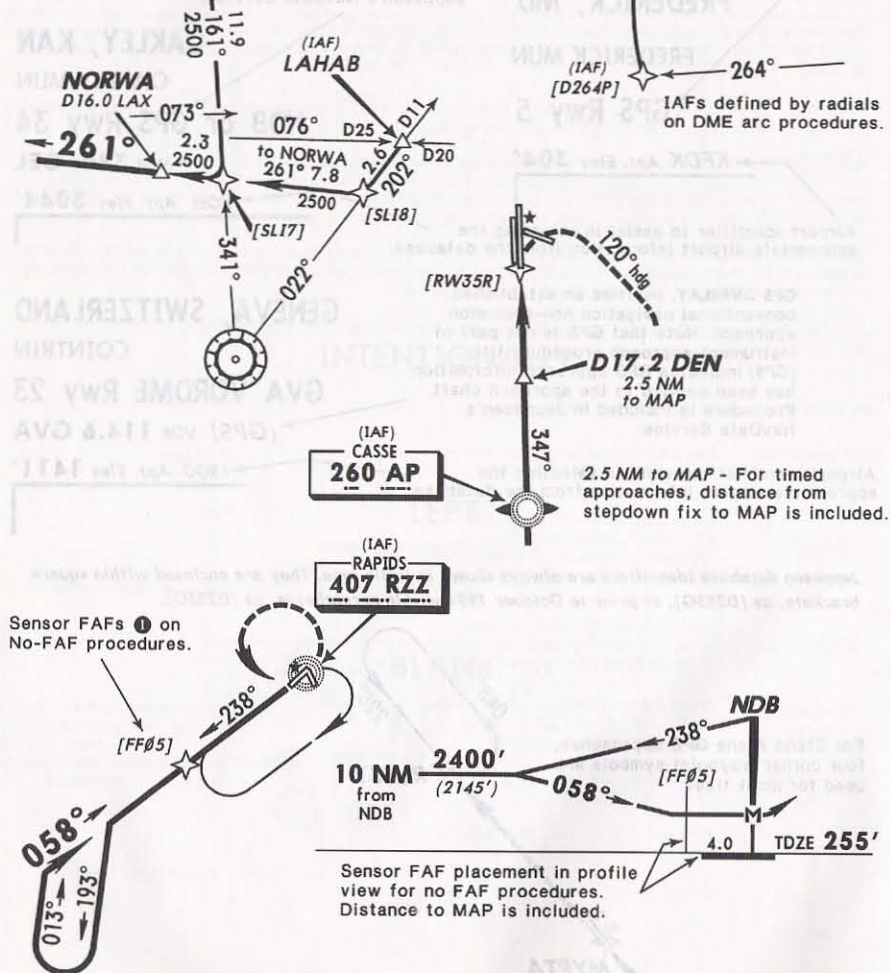


Power and Pole line.

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.



Sensor FAFs ① on No-FAF procedures.

Sensor FAF placement in profile view for no FAF procedures. Distance to MAP is included.

① 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.

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

HEADING	
COMMUNICATIONS	
PRE-APPROACH BRIEFING INFORMATION	MSA
APPROACH PLAN VIEW	
PROFILE VIEW	
CONVERSION TABLES	ICONS
LANDING MINIMUMS	

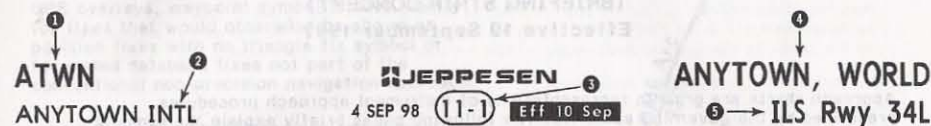
AIRPORT CHART FORMAT

HEADING
COMMUNICATIONS
AIRPORT PLAN VIEW
ADDITIONAL RUNWAY INFORMATION
TAKE-OFF AND ALTERNATE MINIMUMS

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.

APPROACH CHART HEADING



Approach chart heading information consists of the following:

- 1 Jeppesen NavData (ICAO) identifier.
- 2 Airport name.
- 3 Index number. Charts are sequenced by runway number within a similar type.
- 4 Location name.
- 5 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

1 LOC IANT 111.1	2 Final Apch Crs 270°	3 GS AN LOM 2500' (931')	4 ILS DA(H) 1769' (200')	5 Apt Elev 1575' TDZE 1569'	6 MSA AN VOR 5200'
MISSED APCH: Climb to 2500', then climbing LEFT turn to 4500' direct AN LOM and hold.					
1. RADAR required. 2. Simultaneous approaches authorized on Rwy 34L or 34R.					

Information for the pre-approach briefing is listed in the following sequence:

- 1 Primary Navaid frequency and identifier.
- 2 Final Approach Course.
- 3 Glide slope altitude at OM for precision approaches, Minimum altitude at the Final Approach Fix (or equivalent) for non-precision approaches.
- 4 Lowest DA(H) or MDA(H).
- 5 Airport Elevation and Touchdown Zone/Threshold Elevation.
- 6 Missed Approach instructions.

- 7 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.

- 8 Minimum Safe or Sector altitude (MSA). Altitudes are protected to a 25 nautical mile radius unless specified otherwise.

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° → 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

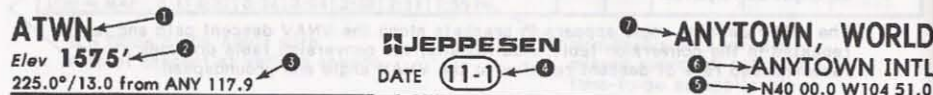
AIRPORT CHART FORMAT

The airport chart is normally printed on the back of the first approach chart. At larger airports the airport chart will precede 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.



- 1 Jeppesen NavData (ICAO) location identifier.
- 2 Airport elevation.
- 3 Bearing and distance to the airport from a VORTAC or VOR DME within 40 NM.
- 4 Index number.
- 5 Airport reference point (ARP) Latitude and Longitude.
- 6 Airport name.
- 7 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.



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

Navids, 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. Navid boxes will include a shadowed outline, intersection or waypoint names will be shown in larger text size.



SPEED RESTRICTIONS

Speed restrictions that apply to the entire procedure are shown below the procedure title.

SPEED: MAX 250 KT BELOW 10000'

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

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.

At or above 5000'	Between FL70 & FL140	Above 2500' Climb to 6000'	MAX 250 KT Minimum Bank 20°
At 3000' Climb to 5000' await further clearance	TURBOPROPS At or above 4500' Climb to 8000'	CIV.3C, MOPIL 3 At or below FL140	JET 280-300 KT At or below FL260
TURN RIGHT At 800' D12 RID whichever is later	REQUESTED FL ABOVE FL245 At or above FL260	RWYS 02, 07 EXPECT FL110 MAX 250 KT	CAT A & B At 5000' EXPECT FL140

LOST COMMUNICATIONS PROCEDURE

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

LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼

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

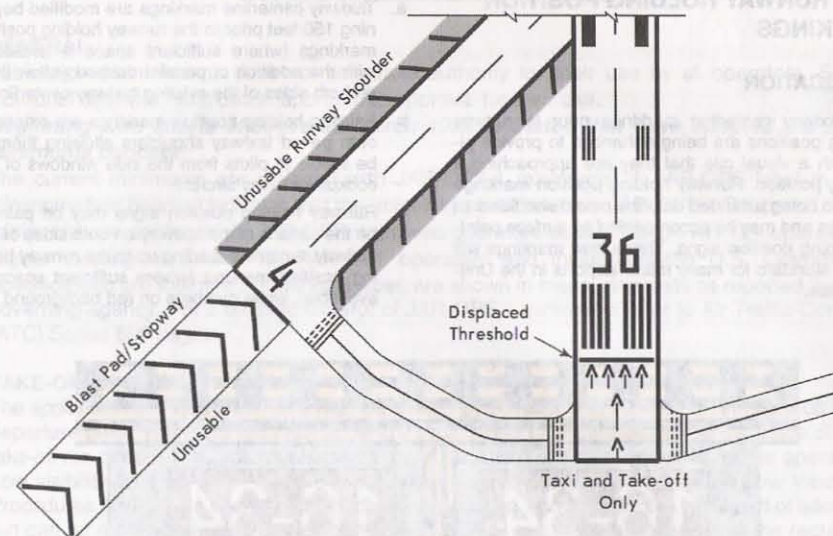
RWY	ROUTING
1L/R	From over Baset Int via ABC R-068 to Reedr Int, then via a 210° heading for RADAR vector to final approach course.

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'

UNITED STATES INSTRUMENT RUNWAY MARKINGS

DISPLACED THRESHOLD MARKINGS AND MARKINGS FOR BLAST PADS AND STOPWAYS

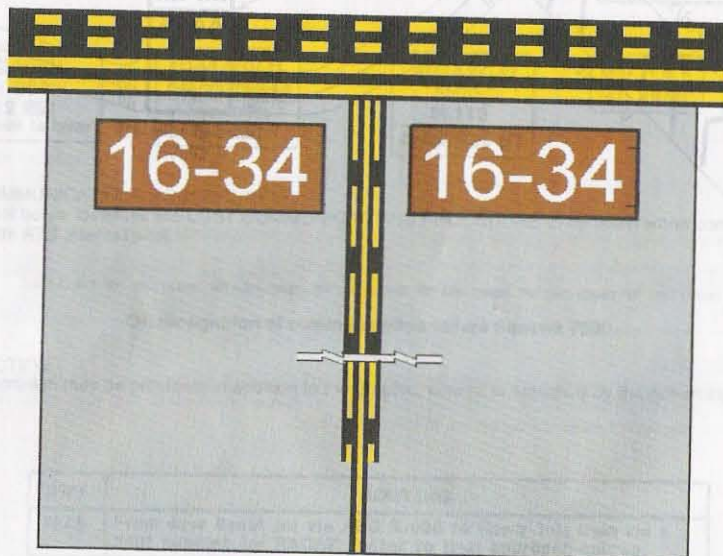


UNITED STATES INSTRUMENT RUNWAY MARKINGS

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.



END OF UNITED STATES AIRPORT SIGNS AND INSTRUMENT RUNWAY MARKINGS

CHARACTERISTICS

- 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.
- 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.
- 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.

APPROACH CHART LEGEND
JAR-OPS 1 AERODROME 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.

Beginning with charts effective 26 March 1998 in States that have adopted the JAA Minimums concept:

The current minimums are replaced with JAR-OPS-1 minimums. A JAR-OPS label in the minimums box heading indicates that the minimums are based on JAR-OPS 1 Subpart E. The minimums are applicable to JAR-OPS approved operators as well as to FAR 121 operators. Higher existing minimums for FAR 121 operators and those applying U.S. Operations Specifications are footnoted. RVR/VIS values are shown in measuring units as reported by the governing agency. For a detailed excerpt of JAR-OPS 1 minimums refer to Air Traffic Control (ATC) Series 600 pages.

TAKE-OFF MINIMUMS

The application of these minimums may be limited by 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. 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 RVR 125m for (CAT A, B, C act) and RVR 150m for (CAT D act).

FORMAT FOR CHARTS IN JAA MEMBER STATES

Sample of Take-off Minimums

JAR-OPS		TAKE-OFF I			
		Rwy 16/34 LVP must be in Force		All Rwys	
Approved Operators HIRL, CL & mult. RVR req		RL, CL & mult. RVR req	RL & CL	RCLM (DAY only) or RL	NIL (DAY only)
A	125m	150m	200m	250m	400m
B					500m
C					
D	150m	200m	250m	300m	

1 Operators applying U.S. Ops Specs: CL required below 300m; approved guidance system required below 150m.

STRAIGHT-IN LANDING

Straight-in landing minimums are generally defined as RVR. When RVR is not reported, the pilot may substitute the charted RVR value by converting the reported meteorological visibility into RVR. (see conversion table 1 below.) Table 1 shall not be applied for calculating Take-off or CAT II/III minimums or when a reported RVR is available.

CIRCLING MINIMUMS

Circling minimums are defined as visibility and are prefixed by a "V".

APPROACH CHART LEGEND JAR-OPS 1 AERODROME MINIMUMS (cont'd)

Sample of CAT I and Non-precision approach Minimums

JAR-OPS		STRAIGHT-IN LANDING RWY 16		CIRCLE-TO-LAND	
Missed apch climb gradient min 2.5% A: 1093' (230') C: 1113' (250') DA(H) B: 1103' (240') D: 1123' (260')		LOC (GS out) with BLM DME MDA(H) 1190' (327')		Max Kts 110 1590' (707') V1500m 135 1620' (737') V1600m 180 2050' (1167') V2400m 205 2250' (1367') V3600m	
FULL		ALS out		MDA(H)	
A	R600m	R900m	ALS out		
B	R600m	R1000m	R1500m		
C		R1000m			
D	R650m	R1200m	R1800m		

■ Min 2.9% : DA(H) 1063' (200'), R550m.

Table 1
Conversion of Reported Meteorological VIS to RVR

Lighting elements in operation	RVR = Reported Met Visibility x	
	DAY	NIGHT
HIALS & RL	1.5	2.0
Any type of lighting installation other than above	1.0	1.5
No lighting	1.0	Not applicable

CAT II MINIMUMS

Minimums are applicable to JAR OPS approved operators as well as to FAR 121 operators and those applying U.S. Operations Specifications. Higher existing minimums in accordance with U.S. Operations Specifications are footnoted.

Sample of CAT II Minimums

JAR-OPS		STRAIGHT-IN LANDING RWY 16	
Missed Apch climb gradient min 2.9% ABCD RA 103' DA(H) 963' (100')		CAT II ILS Missed Apch climb gradient min 2.5% A: RA 142' DA(H) 1001' (138')	
		B: RA 160' DA(H) 1018' (155') C: RA 172' DA(H) 1030' (167') D: RA 187' DA(H) 1044' (181')	
R300m		R400m	R450m

■ Operators applying U.S. Ops Specs: CAT III authorization required below R350m.

JAA AERODROME MINIMUMS LISTING

JAA minimums may be made available either on the instrument approach chart, or on a JAA minimums listing page. The listings, identified as JAA MINIMUMS in the top right corner, are indexed as 10-9X, 20-9X etc and filed in front of the airport chart. Where the airport chart backs up the first approach, they are filed in front of the first approach. The listing will be an interim solution only for all JAA member states until all affected approach charts are revised.

APPROACH CHART LEGEND JAR-OPS 1 AERODROME MINIMUMS (cont'd)

Sample of 10-9X Page

LFBZ (10-9X) 20 MAR 98



JAA MINIMUMS

BIARRITZ, FRANCE

BAYONNE-ANGLET

STRAIGHT-IN RWY	A	B	C	D
09 VORDME	640' (397') R1500m	640' (397') R1500m	640' (397') R1800m	640' (397') R2000m
27 ILS	420' (200') R1000m	420' (200') R1000m	420' (200') R1000m	420' (200') R1000m
LOC	530' (310') R1500m	530' (310') R1500m	530' (310') R1800m	530' (310') R2000m
with BTZ VOR				
NDB	680' (460') R1500m	680' (460') R1500m	680' (460') R2000m	680' (460') R2000m
VORDME	540' (320') R1500m	540' (320') R1500m	540' (320') R1800m	540' (320') R2000m

CIRCLE-TO-LAND ①	110 KT	135 KT	180 KT	205 KT
	690' (447') V1500m	750' (507') V1600m	930' (687') V2400m	990' (747') V3600m

① Prohibited north of runway

② Take-off RWY 09, 27

	LVP must be in Force RCLM (Day only) or RL	RCLM (Day only) or RL	NIL (Day only)
A			
B	250m	400m	500m
C			
D	300m		

② Operators applying U.S. Ops Specs: CL req'd below 300m.

Depiction of JAR-OPS AOM in case of existing State minimums other than JAR-OPS

If State minimums are officially published the depiction of AOM may differ from the standard depiction where all values are expressed in RVR and preceded by an "R".

- If RVR and VIS are charted together, the RVR value is compulsory. RVR/VIS values are preceded "R" respectively "V". If no RVR is reported the VIS shall be used without conversion.
- No prefix will be charted if RVR and VIS is identical. The reported RVR is compulsory. If no RVR is reported the VIS shall be used without conversion.
- If only VIS is charted the visibility value is preceded by a "V" and shall be used without conversion.

END

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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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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

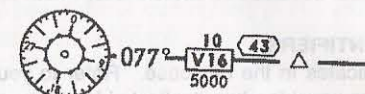
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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

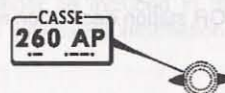
3. NAVAIDS (Cont)

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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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

4. WAYPOINTS (Cont)

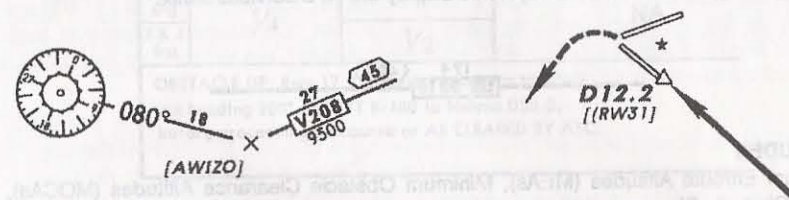
WAYPOINT DATABASE IDENTIFIERS (Cont)

- 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.

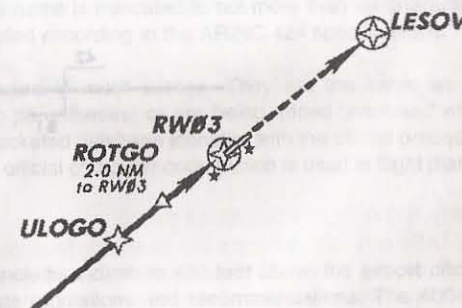
Fly-over fixes have a circle around the fix/waypoint symbol. No special charting is used for fly-by fixes.

ULOGO and ROTGO

Are fly-by waypoints.

RW03 and LESOV

Are fly-over waypoints.



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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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.

145
ATS
4000a

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.

174 420
UB 521F

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.

MAA FL 381
131
E 143D
FL 315 3800Y
2200a

CHANGEOVER POINTS

Changeover points (other than mid-point between navaids) are on charts but are not included in the Jeppesen NavData database.

42
81

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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.*

TAKE-OFF & OBSTACLE DEPARTURE PROCEDURE			
		Rwy 17	Rwy 35
		Adequate Vis Ref	STD
1 & 2 Eng	1/4	1	NA
3 & 4 Eng		1/2	
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.			

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:
DATABASE

Cyote Four Departure(CYOTE.CYOTE4) becomes
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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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

6. ARRIVALS AND DEPARTURES (Cont)

TAKE-OFF MINIMUMS AND CLIMB GRADIENTS

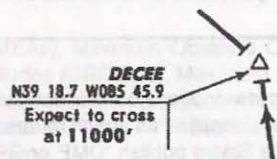
The take-off minimums and climb gradients that are depicted on the charts are not included in the database.

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	883	1025	1387	1708	2060

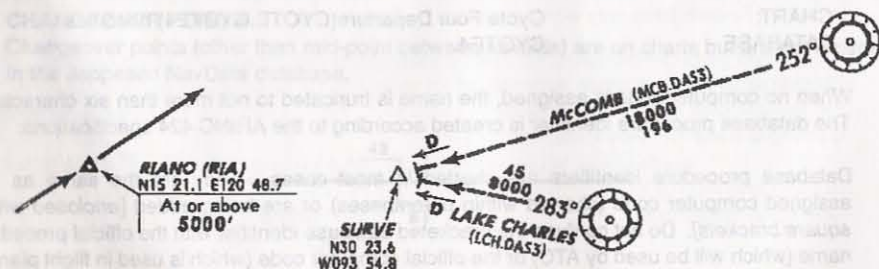
"EXPECT" and "CONDITIONAL" INSTRUCTIONS

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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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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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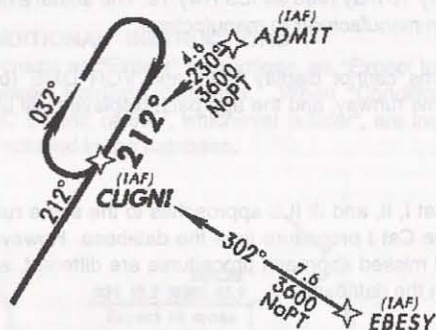
AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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

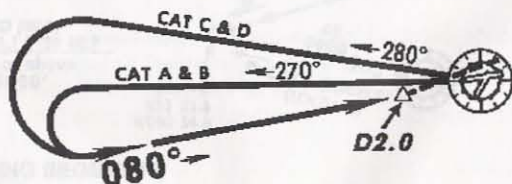


BASE TURN (TEARDROP) APPROACHES

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.



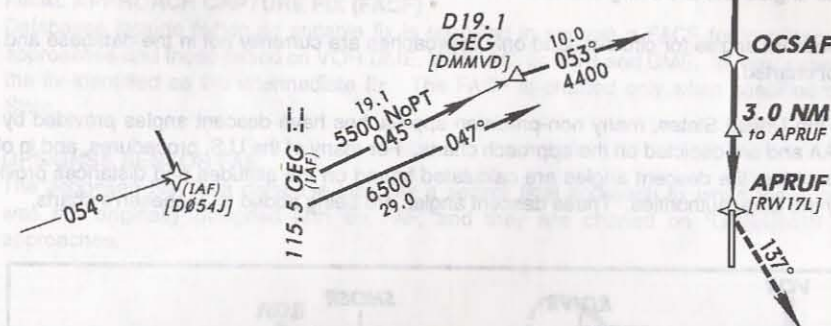
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8. APPROACH PROCEDURES (PLAN VIEW) (Cont)

DME and ALONG TRACK DISTANCES

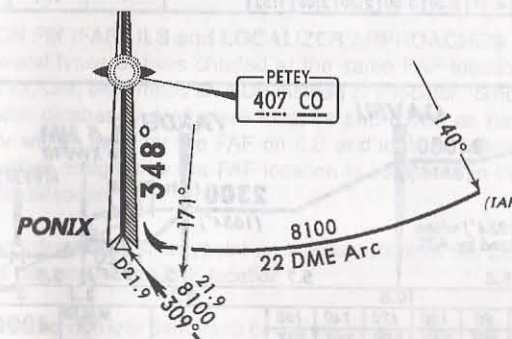
Database identifiers are assigned to many unnamed DME fixes. The Jeppesen identifier is charted on GPS/GNSS type approaches and charted on any type approach when specified as a computer navigation fix (CNF). Unnamed Along Track Distances (ATDs) are charted as accumulative distances to the MAP.



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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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

9. APPROACH PROCEDURES (PROFILE)

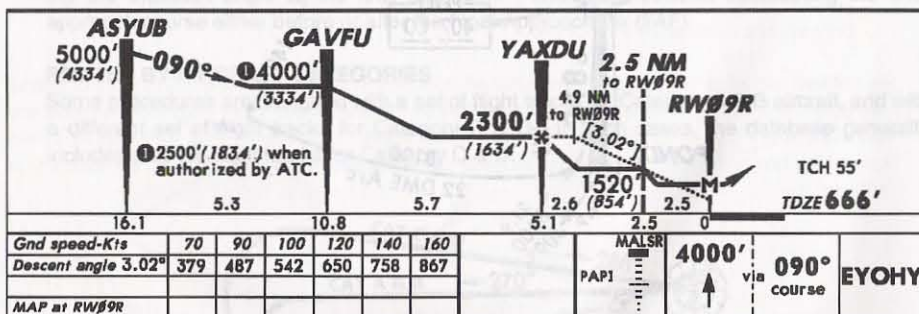
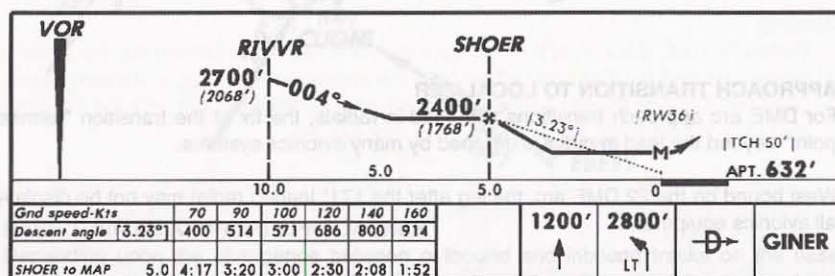
VERTICAL DESCENT ANGLES

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.



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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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

9. APPROACH PROCEDURES (PROFILE) (Cont)

DATABASE IDENTIFIERS

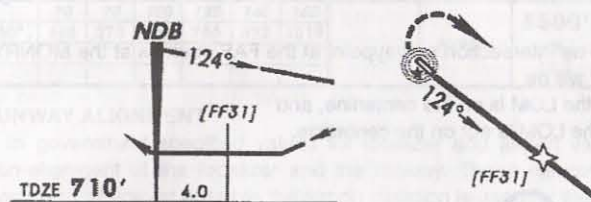
For approach charts where the descent angle is published, all database identifiers from the Final Approach Fix (FAF) to the missed approach termination point are charted in both the plan and profile views. When an FAF is not specified, the NavData database Sensor Final Approach Fix (FAF) is included 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 nav aids, 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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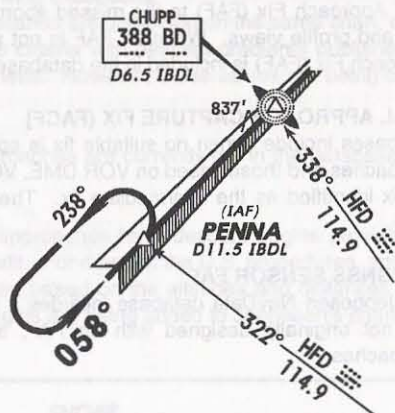
AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

9. APPROACH PROCEDURES (PROFILE) (Cont)

FINAL APPROACH FIX (FAF), ILS and LOCALIZER APPROACHES (Cont)

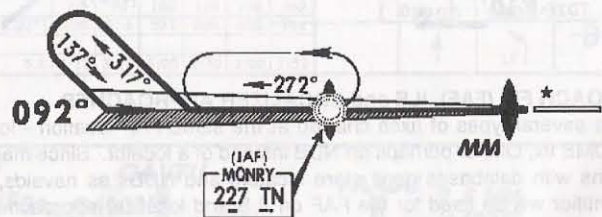
When the ILS or localizer procedure is being flown from the database, the four- or five-character name or identifier such as CHUPP, FF04, or FF04R, etc. will be displayed as the FAF.

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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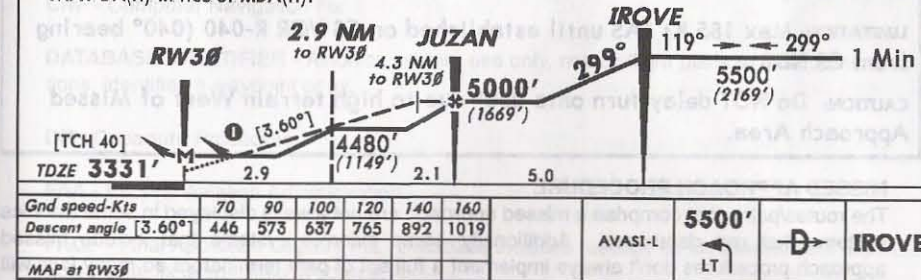
AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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.

① Only authorized operators may use
VNAV DA(H) in lieu of MDA(H).



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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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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 NOT-AMs, 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

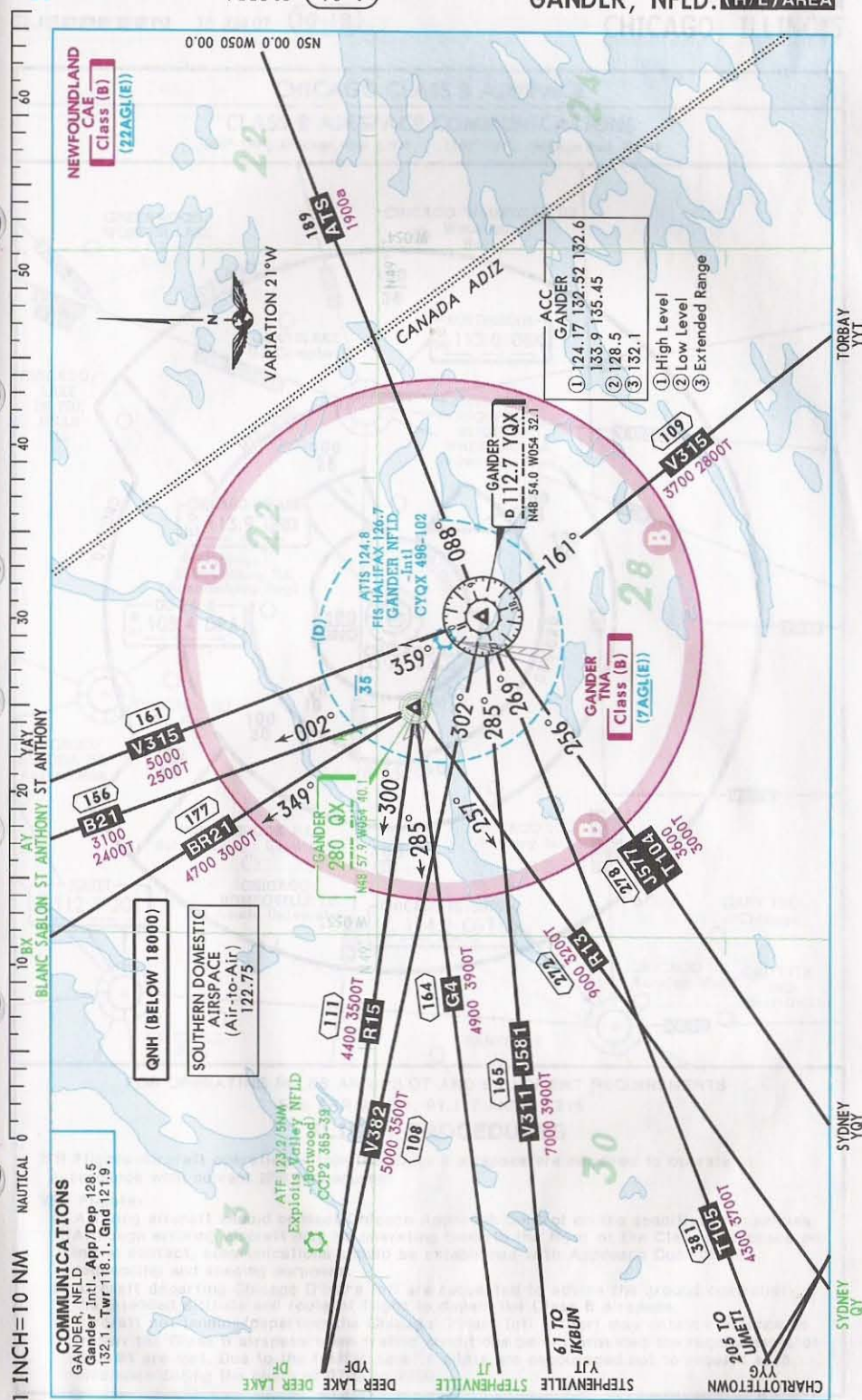
Nav2001

AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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

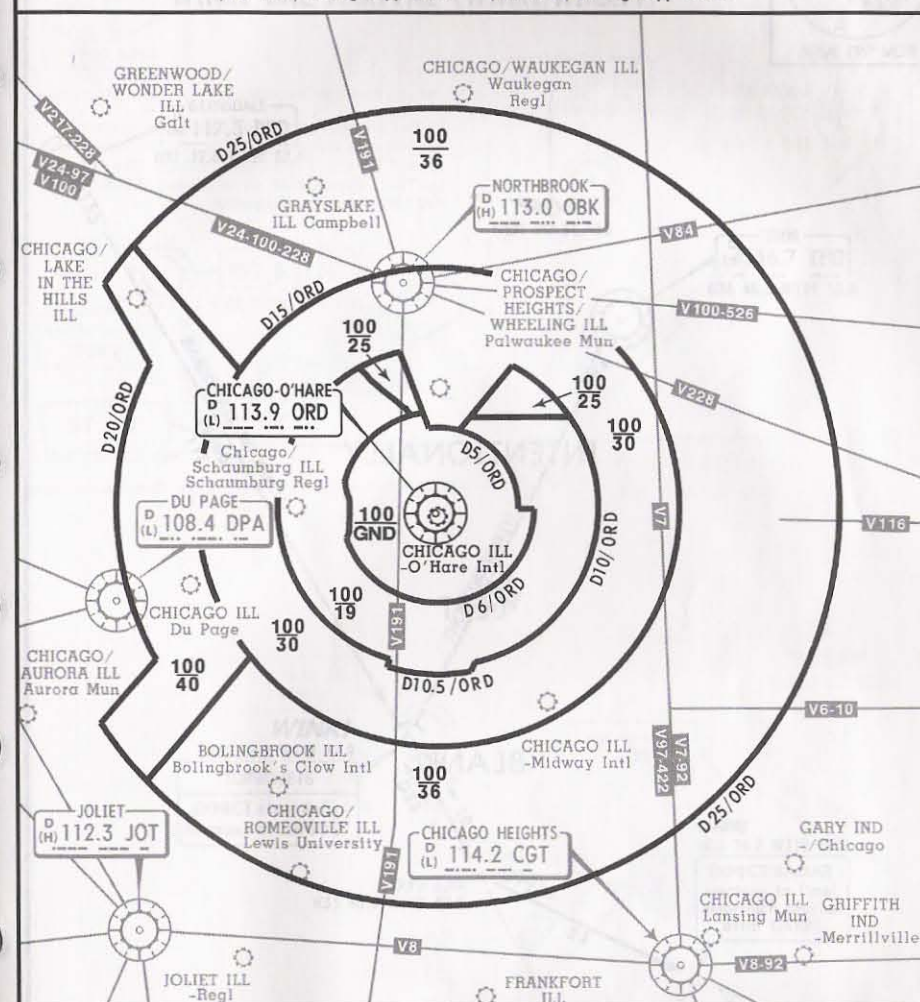


CHICAGO CLASS B AIRSPACE

CLASS B AIRSPACE COMMUNICATIONS

(360°-179°) Chicago App 119.0

(180°-359°) Chicago App 128.45



FOR OPERATING RULES AND PILOT AND EQUIPMENT REQUIREMENTS

SEE FAR 91.131, 91.117 AND 91.215

FLIGHT PROCEDURES

IFR Flights-Aircraft operating within the Class B airspace are required to operate in accordance with current IFR procedures.

VFR Flights-

- a. Arriving aircraft should contact Chicago Approach Control on the specified frequencies. Although arriving aircraft may be operating beneath the floor of the Class B airspace on initial contact, communications should be established with Approach Control for sequencing and spacing purposes.
- b. Aircraft departing Chicago O'Hare Intl are requested to advise the ground controller the intended altitude and route of flight to depart the Class B airspace.
- c. Aircraft not landing/departing the Chicago O'Hare Intl Airport may obtain clearance to transit the Class B airspace when traffic conditions permit provided the requirements of FAR 91 are met. Due to the traffic density pilots are encouraged not to request such clearance during the hours of 0700 to 2300.

KTRP/TRP
LION INTL

JEPPesen

TERPS, CALIF

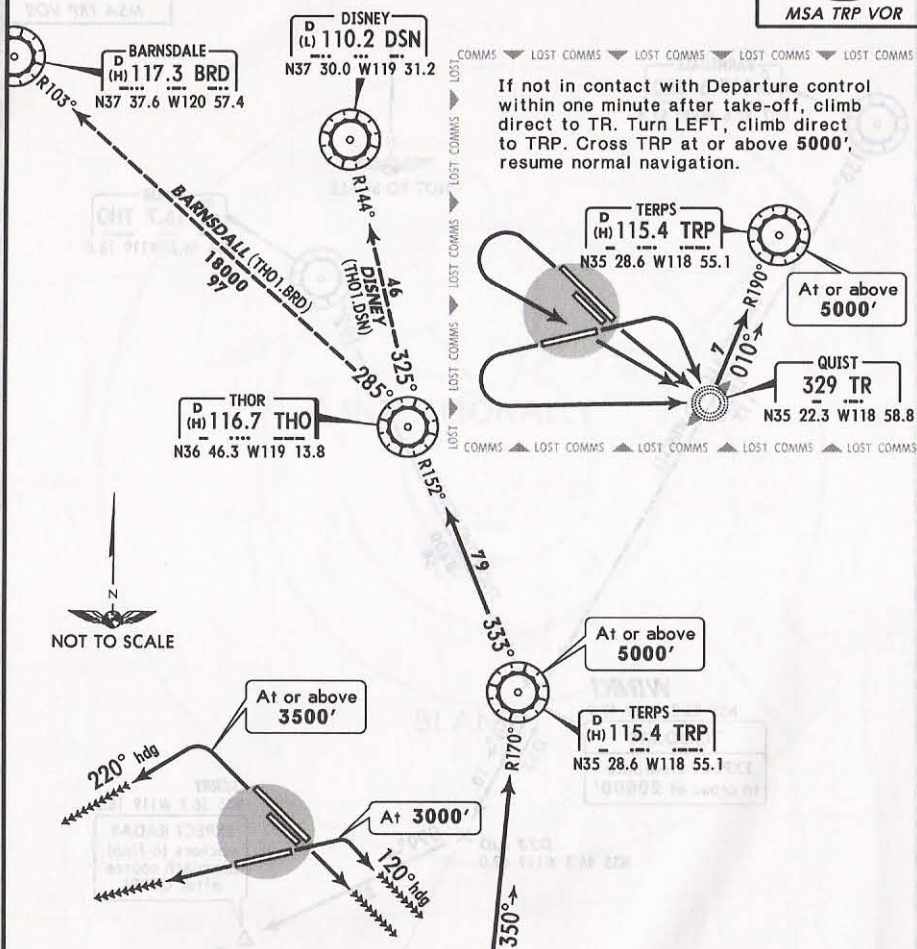
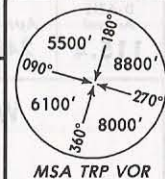
9 SEP 05 10-3 Eff 15 Sep

SID

LION Departure (R) Apt Elev
118.4 **2488'**

Trans level: FL 180 Trans alt: 18000'

THOR ONE DEPARTURE (THO1.TH0)



This SID requires a minimum climb gradient of 260' per NM to 5000'.

Direct distance from Lion Intl to:
TRP 8 NM

Gnd speed-KT	75	100	150	200	250	300
260' per NM	325	433	650	867	1083	1300

RWY	INITIAL CLIMB
6	Climb on runway heading, at 3000' turn RIGHT to a 120° heading for vector to TRP R-170.
12L/R	Climb on runway heading for vector to TRP R-170.
24	Climb on runway heading for vector to TRP R-170.
30L/R	Climb on runway heading, at or above 3500' turn LEFT to a 220° heading for vector to TRP R-170.
ROUTING	
Via TRP R-170 to TRP, then via TRP R-333 and THO R-152 to THO. Then via transition or assigned route.	

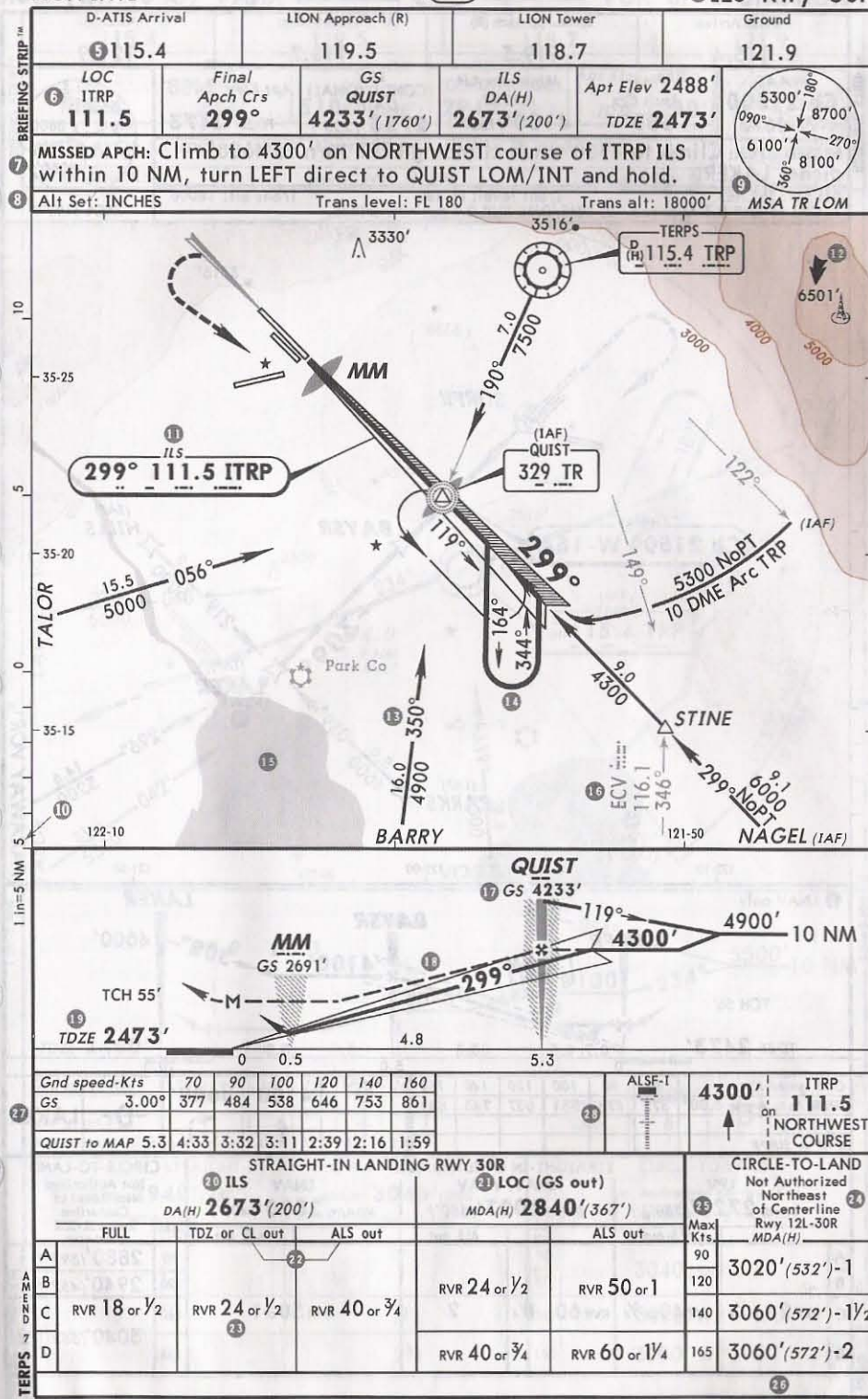
APPROACH CHARTS

- 1 Charts indexed alphabetically by city name within each state
- 2 Approach procedure identification
- 3 Effective date
- 4 Airport identifier and airport name
- 5 Arrival communication frequencies in order of use
- 6 Approach briefing information, including navaid, Final Approach Course, FAF altitude, lowest DA or MDA, and Airport Elevation
- 7 Missed Approach instructions
- 8 Approach procedure notes
- 9 Minimums safe altitudes (MSA)
- 10 Entire plan view drawn to scale
- 11 Primary approach navaid
- 12 Highest reference point within the plan view shown with arrow
- 13 Approach transitions
- 14 Procedure turn fully depicted
- 15 Rivers and water body features
- 16 Intersection formation including navaid morse code identifier
- 17 Glide slope altitude
- 18 Nonprecision profile track
- 19 Touchdown zone elevation (TDZE)
- 20 Decision altitude (DA) and height above touchdown
- 21 Localizer (Glide Slope Out) minimums
- 22 Columns for inoperative component conditions
- 23 Visibilities in runway visual range (RVR) and/or miles
- 24 Circle-to-land minimums
- 25 Maximum speeds for circling maneuvers
- 26 Circling MDA with height above airport and visibilities
- 27 Missed approach time table / rate of descent on glide slope
- 28 Missed approach ICONs, provides approach lighting and initial instructions
- 29 Changes made to the chart since the last issue.
- 30 Database identifiers

KTRP/TRP
LION INTL

JEPPESSEN
9 SEP 05 11-1 Eff 15 Sep

TERPS, CALIF
ILS Rwy 30R

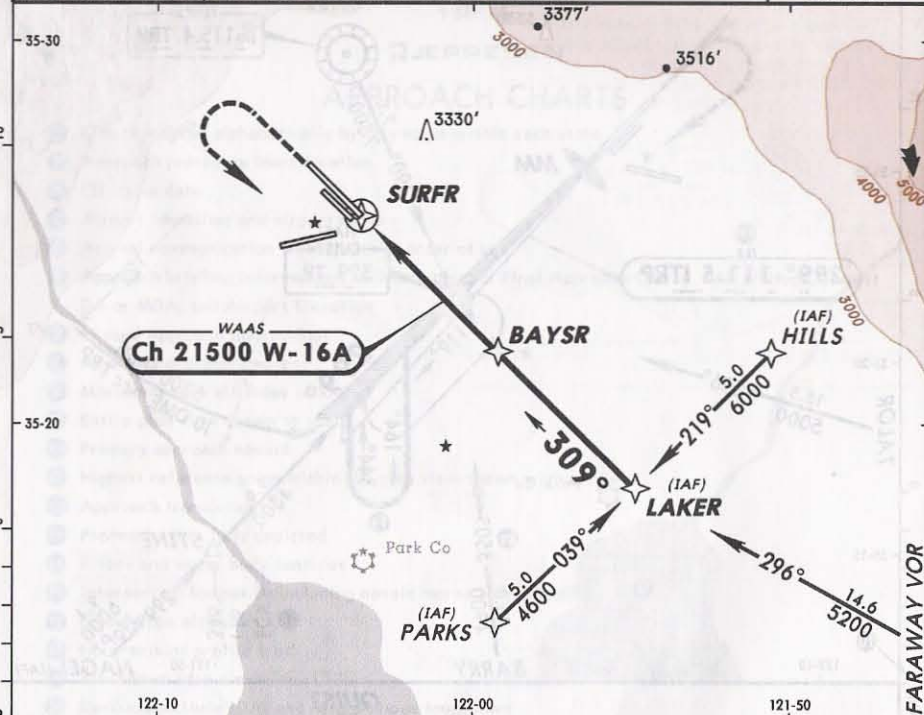


KTRP/TRP
LION INTL

JEPPESSEN
9 SEP 05 (12-1) Eff 15 Sep

TERPS, CALIF
RNAV (GPS) Rwy 30R

D-ATIS Arrival	LION Approach (R)	LION Tower	Ground
115.4	119.5	118.7	121.9
WAAS Ch 21500 W-16A	Final Apch Crs 309°	Minimum Alt BAYSR 4100' (1627')	LPV (CONDITIONAL) DA(H) 2723' (250') Apt Elev 2488' TDZE 2473'
MISSED APCH: Climb to 4100' then climbing LEFT turn to 4600' direct LAKER.			
Alt Set: INCHES		Trans level: FL 180	Trans alt: 18000'
1. GPS or RNP-0.3 required. 2. DME/DME RNP-0.3 not authorized.		MSA SURFR	



① LNAV only

SURFR TCH 56' TDZE 2473'

1.2 NM to SURFR

0.7 0.5

3.8

BAYSR 4100'

5.0

5.0

LAKER 4600' 309°

10.0

Gnd speed-Kts	70	90	100	120	140	160	ALS F-1	4100'	4600'	LAKER
Glide Path Angle 3.00°	372	478	531	637	743	849		↑	LT ↓	
MAP to SURFR										

LPV			STRAIGHT-IN LANDING 30R			LNAV			CIRCLE-TO-LAND				
DA(H) 2723'(250')			LNAV/VNAV			MDA(H) 2880'(407')			Not Authorized Northeast of Centerline Rwy 12L-30R				
ALS out			ALS out			ALS out			Max Kts.				
									90	2880'(392')-1			
									120	2940'(452')-1			
									140				
									165	3040'(552')-2			
A													
B													
C	RVR 24 or 1/2	RVR 40 or 3/4	RVR 60 or 1 1/4	2		RVR 50 or 1							
D													

TERPS, CALIF RADAR-1

LION INTL

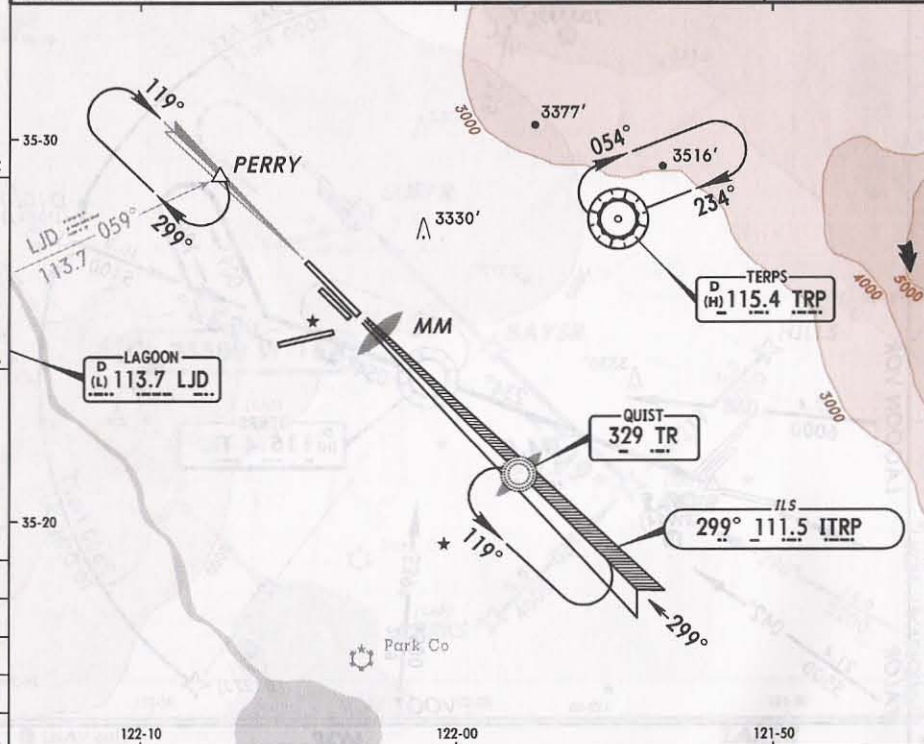
ASR Rwys 6, 12L, 24, 30R

D-ATIS Arrival	LION Approach (R)	LION Tower	Ground
115.4	119.5	118.7	121.9

11074	11795	11501	12779
RADAR	Final ApcH Crs By ATC	Minimum Alt No FAF	MDA(H) Refer to Minimums Apt Elev 2488' TDZE-See below

Missed Approach-See below

Alt Set: INCHES	Trans level: FL 180	Trans alt: 18000'	MSA TRP VOR
-----------------	---------------------	-------------------	-------------



MISSED APPROACH:

Runway 6: Climb to 5500' direct TRP VOR and hold.

Runway 12L: Climb to 5000' direct TR LOM and hold.

Runway 24: Climbing RIGHT turn to 6000' to LJD VOR inbound via R-059.

Runway 30R: Climb to 5000' on NORTHWEST course ITRP LOC to PERRY INT and hold.

RWY 6 TDZE 2441'	RWY 12L TDZE 2488'	RWY 24 TDZE 2460'	RWY 30R TDZE 2473'
---------------------	-----------------------	----------------------	-----------------------

ASR 6		STRAIGHT-IN LANDING		ASR 30R		Max Kts	CIRCLE-TO-LAND Not Authorized Northeast of Centerline Rwy 12L-30R
MDA(H) 2820' (379')		ASR 12L MDA(H) 2940' (452')		ASR 24 MDA(H) 2940' (480')			
RAIL out ALS out				MDA(H) 2860' (387')		ALS out	MDA(H)
A		RVR 50 or 1	1	RVR 24	RVR 50	90	3020' (532') - 1
B	1			or 1/2	or 1	120	
C		RVR 60 or 1 1/4	1 1/4			140	3060' (572') - 1/2
D	1 1/4	1 1/2	1 1/2	RVR 50 or 1	RVR 60 or 1 1/4	165	3060' (572') - 2

CHANGES: Chart updated.

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LSZH/ZRH
ZURICH

JEPPESSEN
MAY 08 11-1 Eff 5 Jun

ZURICH, SWITZERLAND
ILS Rwy 14

23 MAY 08 (11-1) Eff 5 Jun

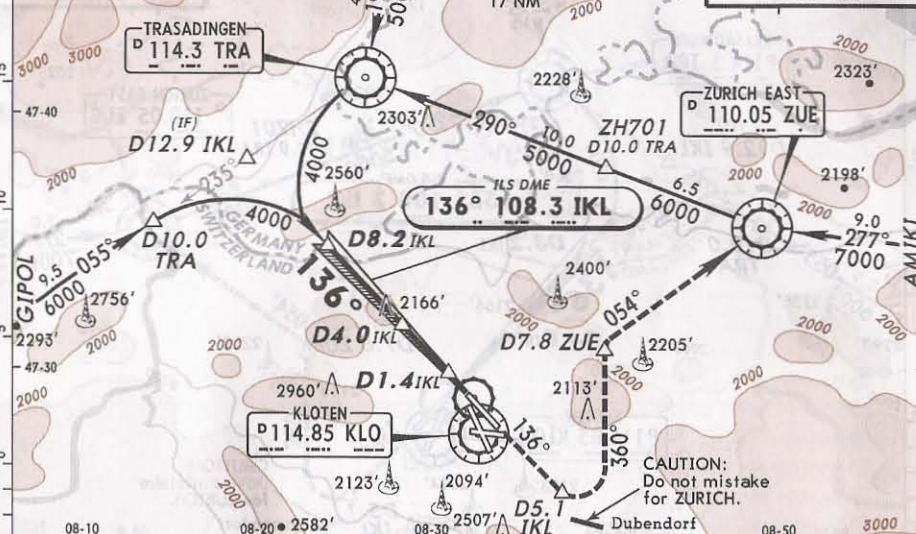
ATIS	ZURICH Arrival (APP/R) ①			ZURICH Tower			Ground
128.52	118.0	120.75	119.7	120.22	118.1	119.7	121.9

LOC IKL 108.3	Final ApcH Crs 136°	GS DA 0 IKL 2670' (1268')	ILS RA 187' DA(H) 1602' (200')	Apt Elev 1416' RWY 1402'	
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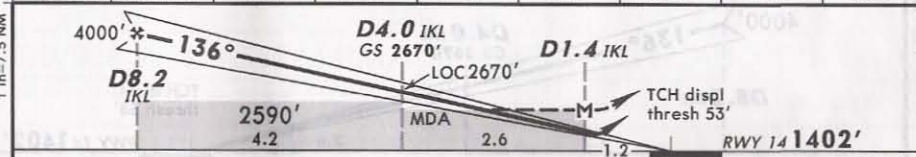
BRIEFING MISSED APCH: Climb STRAIGHT AHEAD. Initial climb to 4000'. At D5.1 IKL past the station, turn LEFT (MAX 210 KT) onto track 360° to intercept R-234 ZUE. At D7.8 ZUE continue climb to 7000'. Proceed to ZUE VOR. Cross ZUE VOR at 6000' or above and intercept R-097 ZUE to AMIKI.

Alt Set: hPa	Rwy Elev: 50 hPa	Trans level: By ATC	Trans alt: 700
ILS front course width 3.5°			

47-50 ① Acft type must be reported at first radio contact.



LOC (GS out)	IKL DME	8.0	7.0	6.0	5.0	4.0	3.0	2.0
	ALTITUDE	3940'	3620'	3300'	2990'	2670'	2350'	2030'



Gnd speed-Kts	70	90	100	120	140	160		D5.1 IKL ↑
ILS GS 3.00° or	377	485	539	647	755	862		
LOC Descent Gradient 5.2%								
MAP at D1.4 IKL								

JAR-OPS		STRAIGHT-IN LANDING RWY14			
ILS		LOC (GS out)			
RA 187'		with IKL DME			
DA(H) 1602' (200')		MDA(H) 1950' (548')			
FULL		ALS out			
A	RVR 550m	RVR 1000m	RVR 1000m	RVR 1500m	
B			RVR 1200m		
C					
D			RVR 1600m	RVR 2000m	

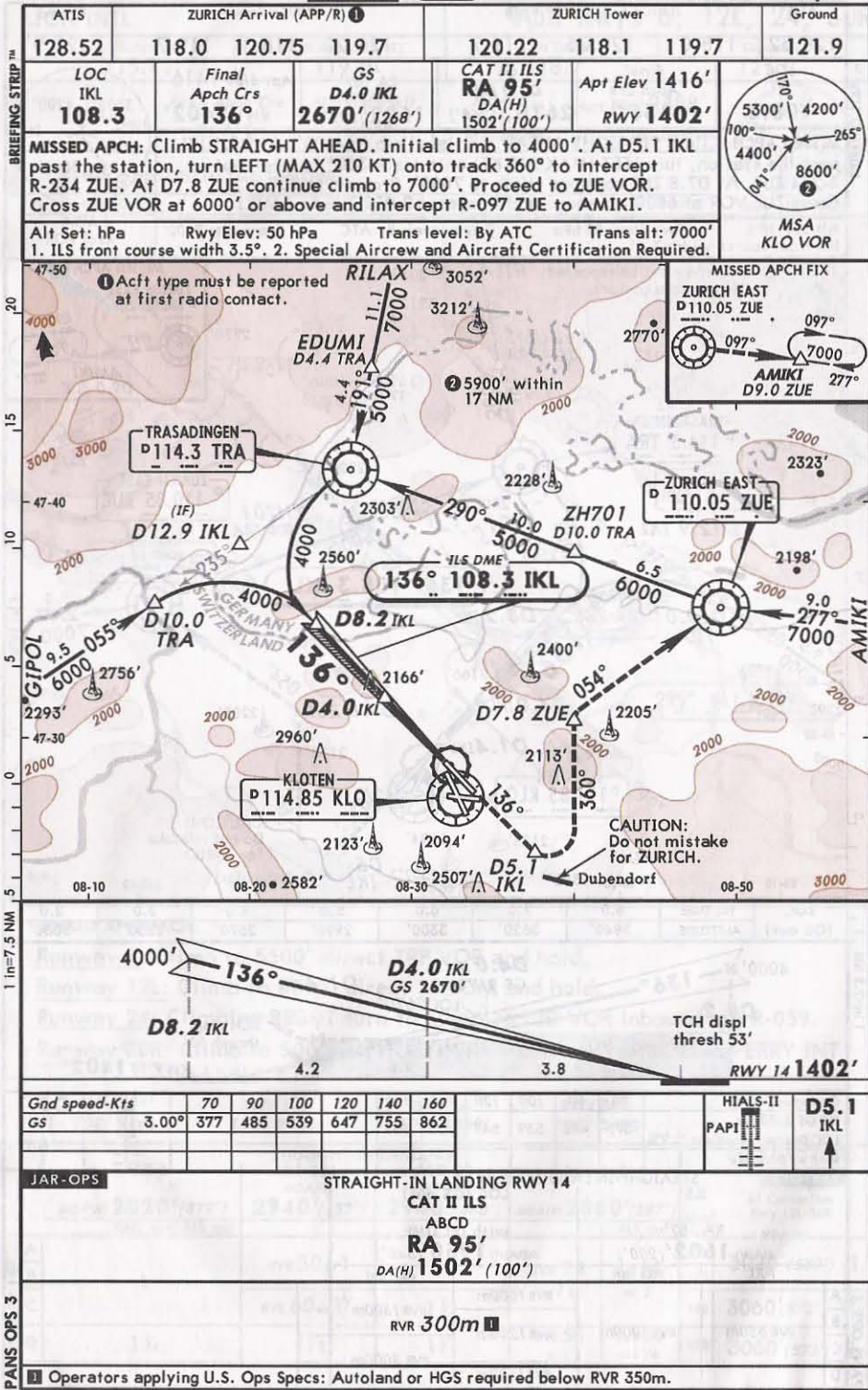
CHANGES: Procedure, Minimums.

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LSZH/ZRH
ZURICH

JEPPesen
23 MAY 08
Eff 5 Jun
11-1A

ZURICH, SWITZERLAND
CAT II ILS Rwy 14



KTRP/TRP

JEPPesen

TERPS

INTENTIONALLY

LEFT

BLANK

128.52	110.0	126.75	119.7	120.22	110.1	119.7	121.7
10C	10C	10C	10C	10C	10C	10C	10C
108.5	134	2670	1401	1401	1401	1401	1401

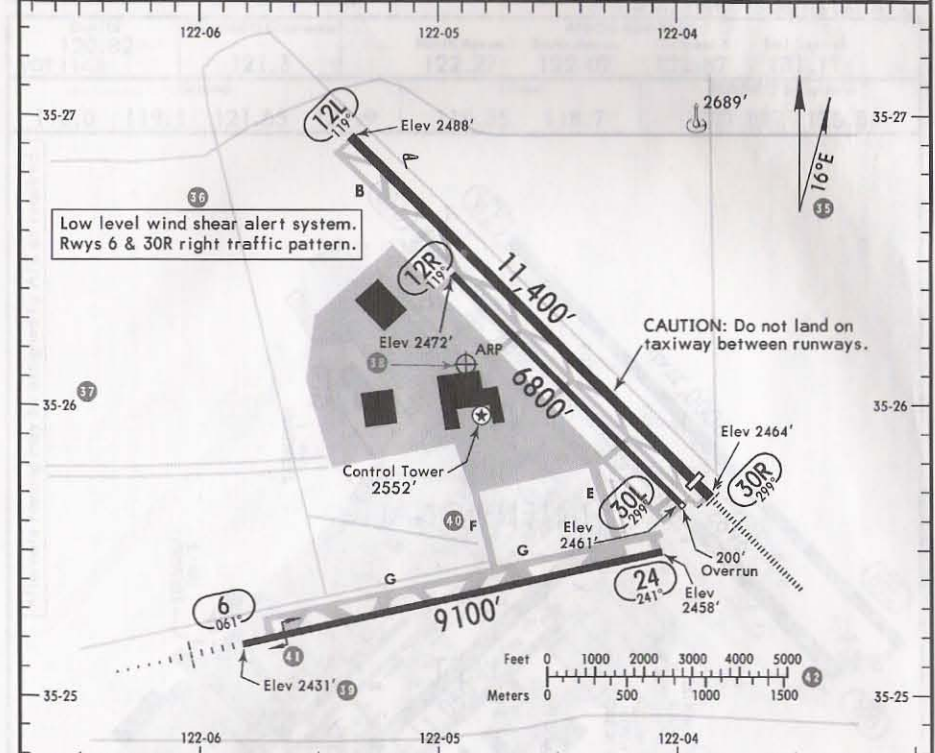
9 SEP 05
JEPPesen
AIRPORT CHART

- 11 Airport identifier
- 12 Coordinates of the airport reference point (ARP)
- 13 Departure communications frequencies in order of use
- 14 VOT frequency
- 15 Magnetic variation at the airport
- 16 Airport notes including right traffic pattern information
- 17 Latitude/longitude grid
- 18 Airport reference point (ARP) location
- 19 Runway threshold elevations
- 20 Taxiway designators
- 21 Arresting gear
- 22 Airport diagram scale
- 23 Runway lighting
- 24 VASI threshold crossing height (TCH) shown for low threshold crossing heights
- 25 Runway grooving
- 26 Distance beyond displaced threshold
- 27 Runway restrictions
- 28 Take-off minimums
- 29 Alternate minimums
- 30 Obstacle departure procedures

AIRPORT QUALIFICATION and FAMILIARIZATION SERVICE

- 31 Chart meet FAR 121.445 crew qualification

D-ATIS Departure 124.6 VOT 110.6	ACARS: D-ATIS PDC TWIP	LION Clearance (Cpt) 121.6	Ground 121.9	Tower 118.7	LION Departure (R) 118.4
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ADDITIONAL RUNWAY INFORMATION					
RWY			USABLE LENGTHS		
			LANDING BEYOND Threshold	GLIDE SLOPE	TAKE-OFF WIDTH
6	HIRL MALSR				150'
24	HIRL REIL VASI (TCH 20')				
12R	MIRL				150'
12L	HIRL CL VASI grooved	RVR			200'
30R	HIRL CL ALSF-I TDZ grooved	RVR	10,950'	10,220'	

1 Restricted to light single and twin engine aircraft.

16 TAKE-OFF & OBSTACLE DEPARTURE PROCEDURE							
Rwys 12L, 30R				Rwys 12R, 24, 30L		Rwy 6	
CL & RCLM	Adequate Vis Ref	STD	Adequate Vis Ref	STD	With Min climb of 340'/NM to 3100'	Other	
any RVR out, other two req.					Adequate Vis Ref	STD	
1&2 Eng	6	RVR 16 or 1/4	1/4	1	1/4	1	300-1
3&4 Eng	6	RVR 24 or 1/2	1/4	1/2	1/4	1/2	300-1

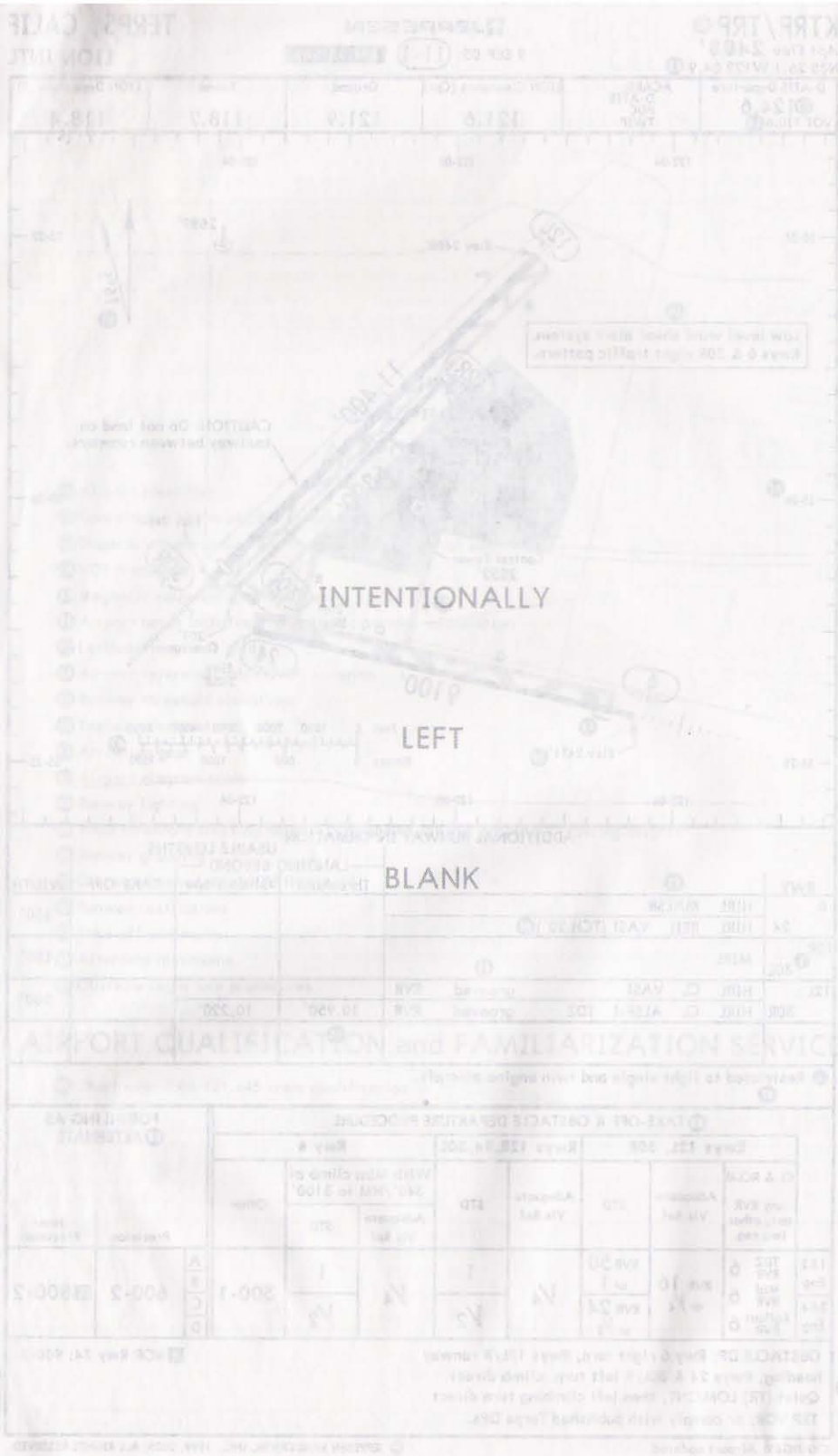
FOR FILING AS
17 ALTERNATE

Precision Non-Precision

600-2 1800-2

OBSTACLE DP: Rwy 6 right turn, Rwys 12L/R runway heading, Rwys 24 & 30L/R left turn, climb direct Quist (TR) LOM/INT, then left climbing turn direct TRP VOR; or comply with published Terps DPs.

1 VOR Rwy 24: 900-2.



CYYZ/YYZ

TORONTO/PEARSON INTL

LESS THAN RVR 1200 TO 600

4 APR 08
Eff 10 Apr

10-9E

JEPPESSEN

SMGCS

TORONTO, ONT

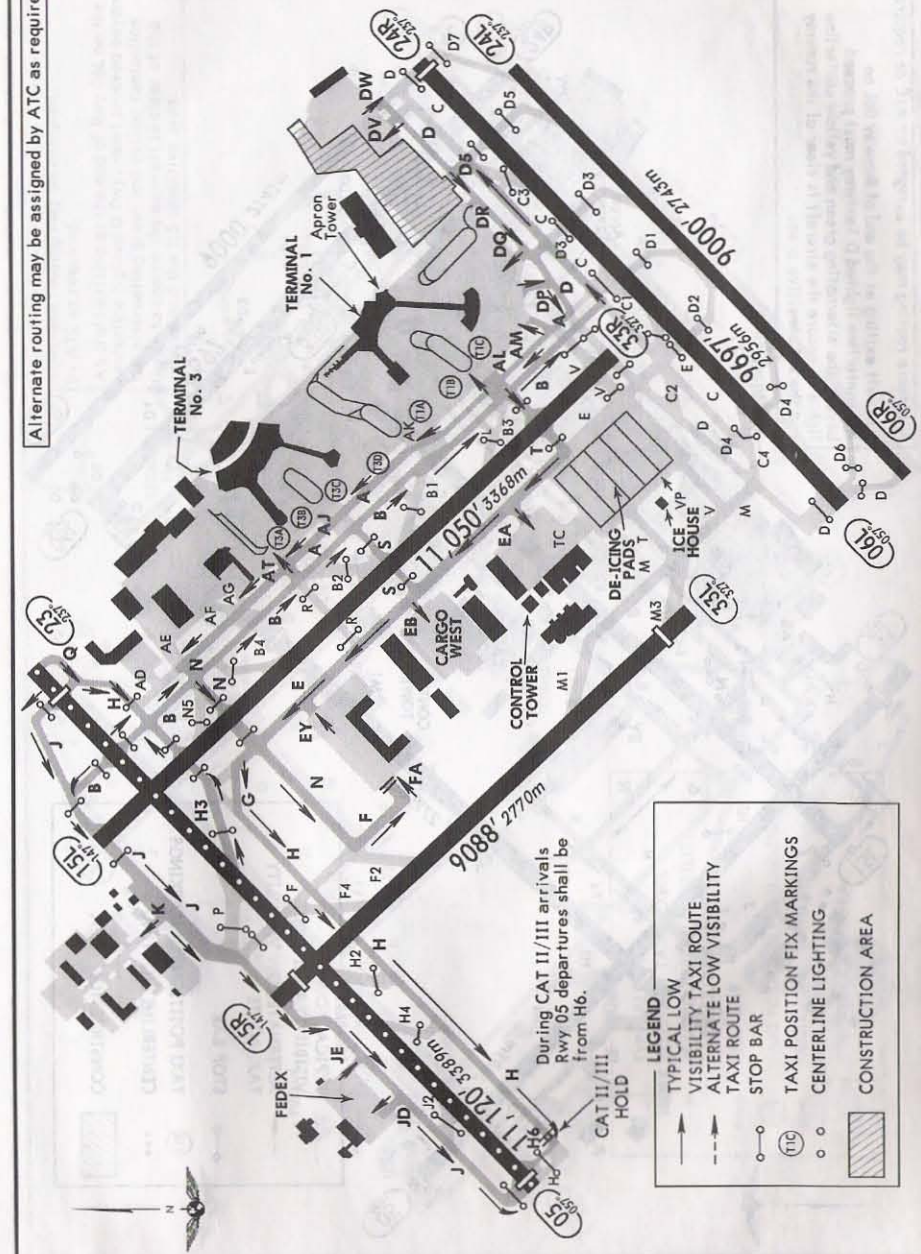
LOW VISIBILITY TAXI CHART

LAND RWY 05, DEPART RWY 05

For Low Visibility Procedures See 10-9G

D-ATIS VOT 114.8	*TORONTO Clearance 121.3	North Apron 122.27	South Apron 122.07	Terminal 3 122.87	Pad Control 131.17
Ground		Tower		TORONTO Departure	
118.0	119.1	121.65	121.9	118.35	118.7
				127.57	128.8

Alternate routing may be assigned by ATC as required.



CHANGES: Construction area modified, Twy DT closed, routes modified.

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CYYZ/YYZ

TORONTO/PEARSON INTL

4 APR 08
Eff 10 Apr

10-9F

TORONTO, ONT

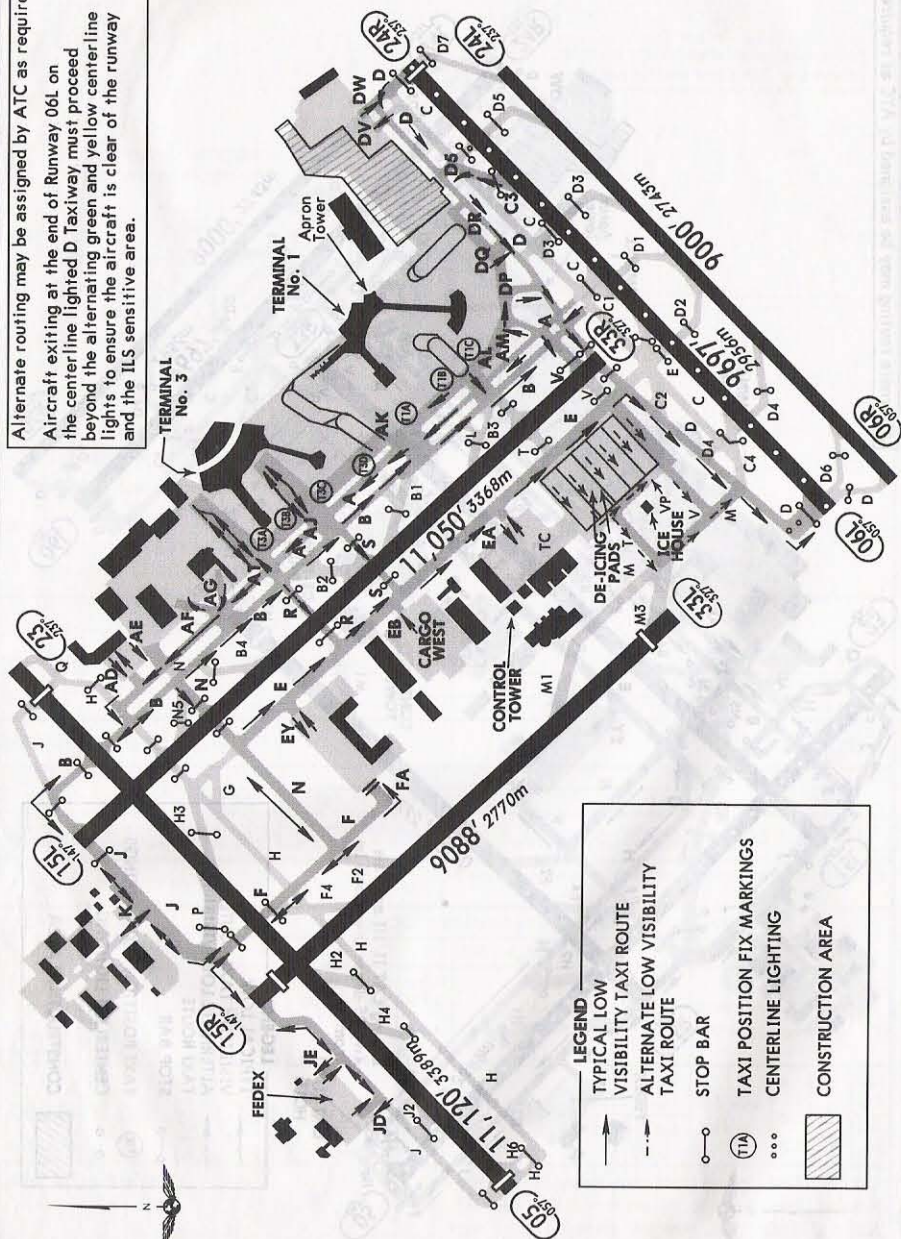
LOW VISIBILITY TAXI CHART

LAND RWY 06L, DEPART RWY 06L

For Low Visibility Procedures See 10-9G

D-ATIS 120.82		*TORONTO Clearance		APRON ADVISORY			
VOT 114.8		121.3		North Apron 122.27	South Apron 122.07	Terminal 3 122.87	Pad Control 131.17
Ground				Tower		TORONTO Departure	
118.0	119.1	121.65	121.9	118.35	118.7	127.57	128.8

A/Alternate routing may be assigned by ATC as required.



CHANGES: Construction area modified, Twy DT closed, routes modified.

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CYYZ/YYZ

TORONTO/PEARSON INTL

4 APR 08
Eff 10 Apr

(10-9F1)

TORONTO, ONT

LOW VISIBILITY TAXI CHART

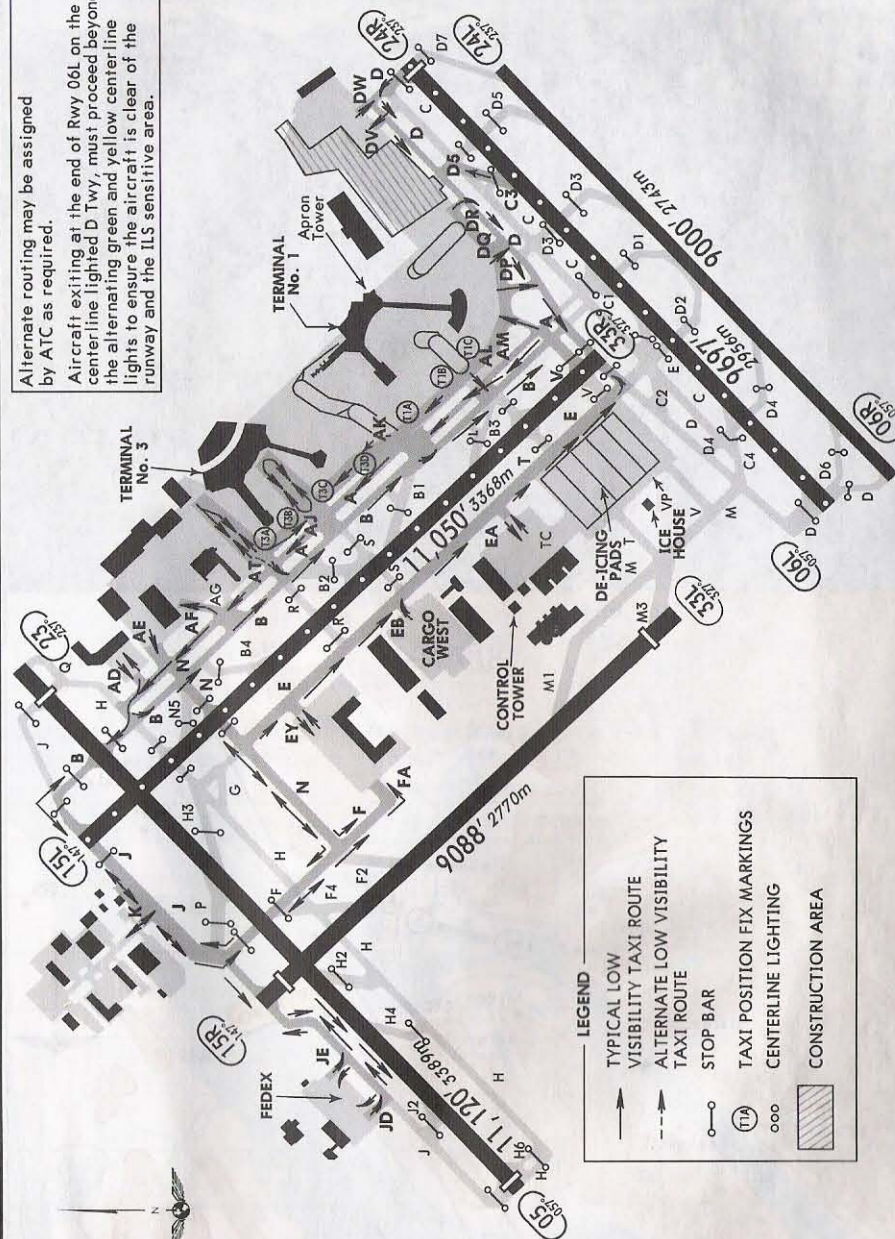
LAND RWY 06L, DEPART RWY 33R

For Low Visibility Procedures See 10-9G

D-ATIS 120.82 VOT 114.8		*TORONTO Clearance 121.3		APRON ADVISORY North Apron 122.27 South Apron 122.07 Terminal 3 122.87 Pad Control 131.17			
Ground 118.0 119.1 121.65 121.9				Tower 118.35 118.7		TORONTO Departure 127.57 128.8	

Alternate routing may be assigned by ATC as required.

Aircraft exiting at the end of Rwy 06L on the centerline lighted D TWY, must proceed beyond the alternating green and yellow centerline lights to ensure the aircraft is clear of the runway and the ILS sensitive area.



CHANGES: Construction area modified. Twy DT closed, routes modified.

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1. Airport Qualification: Mountainous Terrain
2. CAUTION: Possible Moderate to Severe Turbulence with Strong Winds from the Southeast Quadrant

Apt Elev 21'

7 NM Northwest Juneau

N58 21.3 W134 34.6



OVERVIEW



Public

Longest Rwy (LDA): Rwy 8/26 - 8456' (2577m) Time Conv (Std): UTC -9

OVERVIEW

Juneau International Airport is located in the Panhandle of southeastern Alaska. The airport is in a low marshy basin at the north end of Gastineau Channel. Terrain sharply rises from this basin, within a half mile northeast of the airport. Douglas Island is across the channel to the south and terrain rises to 3429 feet MSL within 5 NM. To the northeast, Thunder Mountain rises to 3185 feet MSL within 3 NM. In the northeast quadrant beyond 8 NM, there is an extensive glacier field with several peaks exceeding 5500 feet MSL.

The higher landing minimums and special missed approach procedures are designed to allow for clearance of high terrain near the airport.

Wildlife and birds are present on and in the airport vicinity.

Extensive helicopter activity occurs during tourist season, from April 15th through October 1st. During periods of high activity, two tower frequencies will be used.

Paragliding exists in the vicinity of Thunder Mountain (3 NM to the north), and over Gastineau Channel near downtown. This activity occurs from April 15th through October 1st, at or below 6000 feet MSL.

Sight seeing operations are also extensive over downtown Juneau and in the Gastineau Channel. Juneau tower strongly encourages all traffic arriving from the southeast, monitor (and announce position) on the downtown UNICOM frequency.

The airport is equipped with a low level windshear alert system (LLWAS).

WEATHER

Seasonal data represents average monthly values

Remarks:

Fog occurs throughout the year. In winter, strong northerly winds often approach 100 mph through the Gastineau Channel. This is normally associated with clear weather and occurs about twice a month, often for several days at a time.

	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov
① Precip Amount	4.2 in 107 mm	3.2 in 81 mm	4.1 in 104 mm	6.8 in 173 mm
Snowfall	23.3 in 59 cm	6 in 15 cm		5 in 12 cm
Other Precip			<1 day Thunderstorm	
IMC	12%	4%	2%	6%
Prevailing Winds	ESE-13 kts	ESE-12 kts	② N-7 kts	ESE-13 kts
Low Temp	21°F -6°C	32°F 0°C	47°F 8°C	36°F 2°C
High Temp	32°F 0°C	47°F 8°C	63°F 17°C	47°F 8°C

① Annual precipitation totals 1402 mm (55.2 in).

② Winds are from the east-southeast in June.

CHANGES: None.

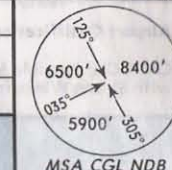
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1. Airport Qualification: Mountainous Terrain
2. CAUTION: Possible Moderate to Severe Turbulence with Strong Winds from the Southeast Quadrant

Apt Elev 21'

7 NM Northwest Juneau

N58 21.3 W134 34.6



RUNWAY 8

This runway uses a right-hand traffic pattern.

Visual vertical guidance is provided by VASI (3.0°) on the left side of the runway.

A seaplane landing area parallels this runway immediately to the south.

Circling to land is not authorized north of this runway.

There is an Obstacle Departure Procedure for this runway and the lowest takeoff minimums require a minimum climb gradient of 250 feet/NM up to 4500 feet MSL at night.

Rejected landings, missed approach, and engine inoperative procedures may require special attention due to high climb gradients required for obstacle clearance. Check to see if your company provides special procedures for this runway.

CHANGES: MSA.

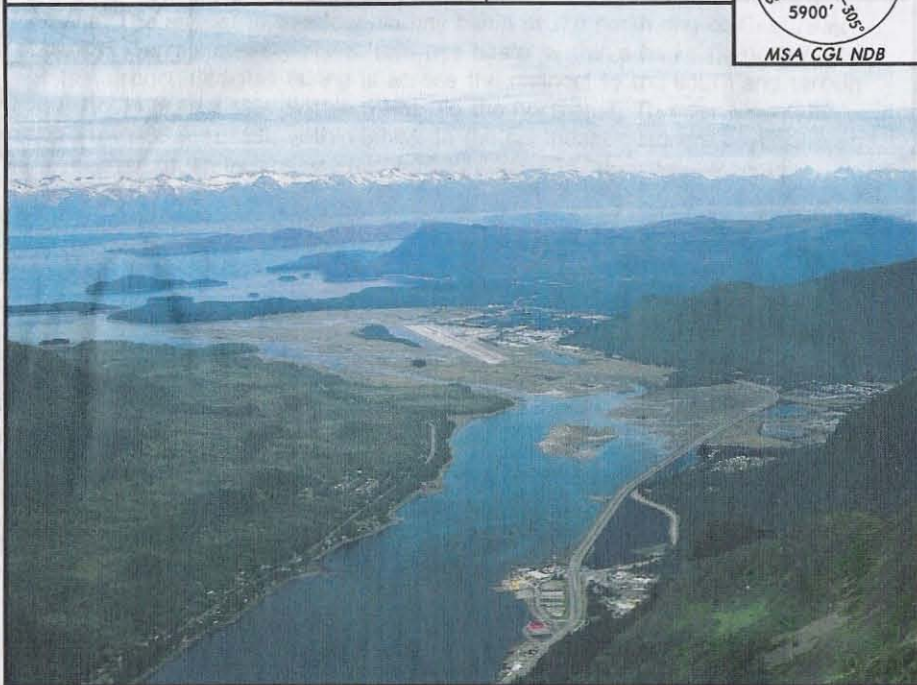
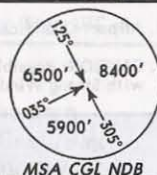
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1. Airport Qualification: Mountainous Terrain
2. CAUTION: Possible Moderate to Severe Turbulence with Strong Winds from the Southeast Quadrant

Apt Elev 21'

7 NM Northwest Juneau

N58 21.3 W134 34.6



Note: The perspective presented by this picture does not represent what is seen during normal landing procedures.

RUNWAY 26

There are no straight-in instrument approach procedures to this runway.

Visual vertical guidance is provided by VASI (3.0°) on the right side of the runway. The VASI is usable only within 2 NM.

A seaplane landing area parallels this runway immediately to the south.

Circling to land is not authorized north of this runway.

There is an Obstacle Departure Procedure for this runway and the lowest takeoff minimums require a minimum climb gradient of 520 feet/NM up to 600 feet MSL, then 250 feet/NM up to 4500 feet MSL.

Rejected landings, missed approach, and engine inoperative procedures may require special attention due to high climb gradients required for obstacle clearance. Check to see if your company provides special procedures for this runway.

INTENTIONALLY

LEFT

BLANK



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