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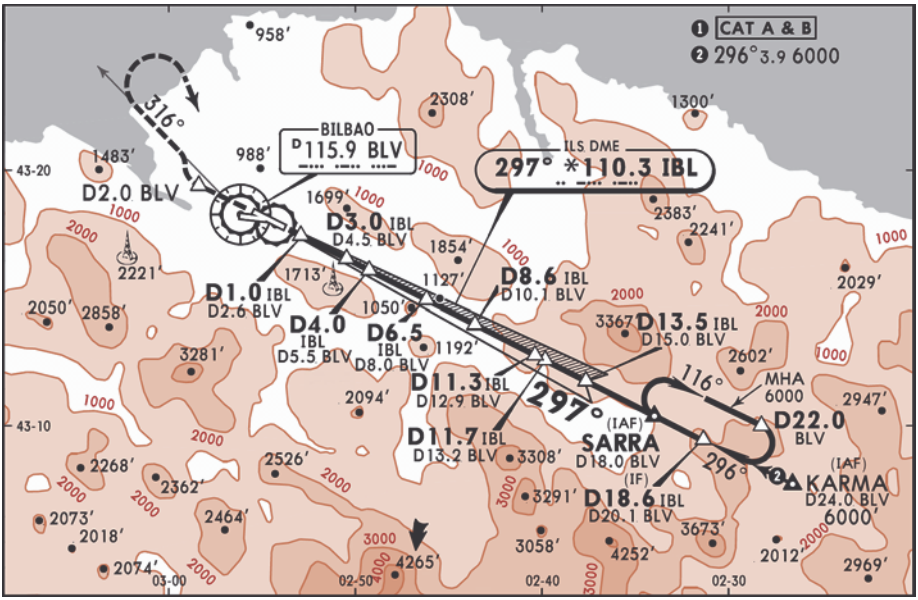

INTRODUCTION TO JEPPESEN NAVIGATION CHARTS

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

This chart training guide is published as a service for pilots to familiarize with Jeppesen navigation charts. It provides extracts of the Jeppesen Airway Manual including portions of the Introduction section such as Glossary, Abbreviations, and Charting Symbols legends for Enroute, SID/STAR, Airport and Approach charts. It pays special attention to the subject of Aerodrome Operations Minimums, followed by a variation of chart examples representing the various types of terminal and procedure charts to enable a general familiarization.

This guide is intended for reference only and includes some of the most commonly used symbology. It is revised regularly; however, not all symbology may be included or some variance may exist between this guide and current Jeppesen chart services due to chart issuance dates, timely application of changes received from governing agencies and / or the method of representing such information. Some of the chart extracts in this guide are based on a fictitious location for the purpose of demonstrating specific features.

The chart training guide has been designed as supplementary training material and is not intended for navigation.

For more information regarding Jeppesen charts and available services, please visit www.jeppesen.com

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. A 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 take-off run available plus the length of the stopway, if provided.

ACROBATIC FLIGHT — Manoeuvres intentionally performed by an aircraft involving an abrupt change in its attitude, an abnormal attitude, or an abnormal variation in speed.

ADEQUATE VIS REF (Adequate Visual Reference) — Another set of lower-than-standard takeoff minimums is available to Part 121 and Part 135 operations as outlined in their respective OpSpecs document. When certain types of visibility reports are unavailable or specific equipment is out of service, the flight can still depart the airport if the pilot can maintain adequate visual reference. An appropriate visual aid must be available to ensure the takeoff surface can be continuously identified, and directional control can be maintained throughout the takeoff run. Appropriate visual aids include high intensity runway lights, runway centerline lights, runway centerline markings, or other runway lighting and markings. With adequate visual references and appropriate OpSpec approval, commercial operators may take off with a visibility of 1600 RVR or ¼ SM.

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ADS AGREEMENT — An ADS reporting plan which establishes the conditions of ADS data reporting (i.e., data required by the air traffic services unit and frequency of ADS reports which have to be agreed to prior to the provision of the ADS services).

NOTE: The terms of the agreement will be exchanged between the ground system and the aircraft by means of a contract, or a series of contracts.

ADS-B — A surveillance system in which an aircraft or vehicle to be detected is fitted with cooperative equipment in the form of a data link transmitter. The aircraft or vehicle periodically broadcasts its GPS-derived position and other information such as velocity over the data link, which is received by a ground-based transmitter/receiver (transceiver) for processing and display at an air traffic control facility.

ADS-C AGREEMENT — A reporting plan which establishes the conditions of ADS-C data reporting (i.e. data required by the air traffic services unit and frequency of ADS-C reports which have to be agreed to prior to using ADS-C in the provision of air traffic services).

NOTE: The terms of the agreement will be exchanged between the ground system and the aircraft by means of a contract, or a series of contracts.

ADS CONTRACT — A means by which the terms of an ADS agreement will be exchanged between the ground system and the aircraft, specifying under what conditions ADS reports would be initiated, and what data would be contained in the reports.

NOTE: The term "ADS contract" is a generic term meaning variously, ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode. Ground forwarding of ADS reports may be implemented between ground systems.

ADVISORY AIRSPACE — An airspace of defined dimensions, or designated route, within which air traffic advisory service is available.

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 — A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

NOTE: The term "aerodrome" where used in the provisions relating to flight plans and ATS messages is intended to cover also sites other than aerodromes which may be used by certain types of aircraft; e.g., helicopters or balloons.

AERODROME CLIMATOLOGICAL SUMMARY — Concise summary of specified meteorological elements at an aerodrome, based on statistical data.

AERODROME CLIMATOLOGICAL TABLE — Table providing statistical data on the observed occurrence of one or more meteorological elements at an aerodrome.

AERODROME CONTROL SERVICE — Air traffic control service for aerodrome traffic.

AERODROME CONTROL TOWER — A unit established to provide air traffic control service to aerodrome traffic.

AERODROME ELEVATION — The elevation of the highest point of the landing area.

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 METEOROLOGICAL OFFICE — An office, located at an aerodrome, designated to provide meteorological service for international air navigation.

AERODROME REFERENCE CODE (ARC) — 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

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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 Number	**Aeroplane Reference Field Length**
1	Less than **800m**
2	**800m** up to but not including **1200m**
3	**1200m** up to but not including **1800m**
4	**1800m** and over
Code Element 2	
Code Letter	**Wingspan**
A	Up to but not including **15m**
B	**15m** up to but not including **24m**
C	**24m** up to but not including **36m**
D	**36m** up to but not including **52m**
E	**52m** up to but not including **65m**
F	**65m** up to but not including **80m**

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 — All traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.

NOTE: An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.

AERODROME TRAFFIC CIRCUIT — The specified path to be flown by aircraft operating in the vicinity of an aerodrome.

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 5NM 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 5NM.

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

AERONAUTICAL FIXED SERVICE (AFS) — A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.

AERONAUTICAL FIXED STATION — A station in the aeronautical fixed service.

AERONAUTICAL FIXED TELECOMMUNICATION NETWORK (AFTN) — A world-wide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communications characteristics.

AERONAUTICAL GROUND LIGHT — Any light specially provided as an aid to air navigation, other than a light displayed on an aircraft.

AERONAUTICAL INFORMATION PUBLICATION (AIP) — A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

AERONAUTICAL METEOROLOGICAL STATION — A station designated to make observations and meteorological reports for use in international air navigation.

AERONAUTICAL MOBILE SERVICE — A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radio beacon stations may also participate in this service on designated distress and emergency frequencies.

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

AERONAUTICAL STATION — A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.

AERONAUTICAL TELECOMMUNICATION SERVICE — A telecommunication service provided for any aeronautical purpose.

AERONAUTICAL TELECOMMUNICATION STATION — A station in the aeronautical telecommunication service.

AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS) — An aircraft system based on secondary surveillance radar (SSR) transponder signals which operates independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders.

AIRCRAFT — Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

AIRCRAFT ADDRESS — A unique combination of 24 bits available for assignment to an aircraft for the purpose of air-ground communications, navigation and surveillance.

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

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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:

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

AIRCRAFT APPROACH CATEGORY (ICAO) — The ICAO table, depicted in the ATC section "Flight Procedures (DOC 8168) Arrival and Approach Procedures", 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.

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AIRCRAFT GROUP NUMBER (AGN) — See Canada ATC Air Operations for additional information.

Wingspan	Aircraft Group Number
Less than 14.94m (49 ft)	I
14.94m up to but not including 24.10m (79 ft)	II
24.10m up to but not including 36.00m (118 ft)	IIIA / IIIB
36.00m up to but not including 52.12m (171 ft)	IV
52.12m up to but not including 65.23m (214 ft)	V
65.23m up to but not including 79.86m (262 ft)	VI

AIRCRAFT IDENTIFICATION — A group of letters, figures or combination thereof which is either identical to, or the coded equivalent of, the aircraft call sign to be used in air-ground communications, and which is used to identify the aircraft in ground-ground air traffic services communications.

AIRCRAFT – LARGE AIRCRAFT (LACFT) — Term used when referring to ICAO aircraft category DL standard dimensions:

– wing span – more than 65m/213ft (max 80m/262ft); and/or

– vertical distance between the flight paths of the wheels and the glide path antenna – more than 7m/23ft (max 8m/26ft).

For precision approach procedures, the dimensions of the aircraft are also a factor for the calculation of the OCH.

For category DL aircraft, additional OCA/H is provided, when necessary.

AIRCRAFT OBSERVATION — The evaluation of one or more meteorological elements made from an aircraft in flight.

AIRCRAFT PROXIMITY — A situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised. An aircraft proximity is classified as follows:

Risk of Collision — The risk classification of an aircraft proximity in which serious risk of collision has existed.

Safety not Assured — The risk classification of an aircraft proximity in which the safety of the aircraft may have been compromised.

No Risk of Collision — The risk classification of an aircraft proximity in which no risk of collision has existed.

Risk not Determined — The risk classification of an aircraft proximity in which insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination.

AIRCRAFT STATION — A mobile station in the aeronautical mobile service, other than a survival craft station, located on board an aircraft.

AIRCRAFT SURFACE SURVEILLANCE CAPABILITY (ASSC) — A surveillance system using multilateration and ADS-B aircraft information to track surface movements of aircraft and vehicles.

AIR DEFENSE IDENTIFICATION ZONE (ADIZ) — 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.

AIR-GROUND COMMUNICATION — Two-way communication between aircraft and stations or locations on the surface of the earth.

AIR-GROUND CONTROL RADIO STATION — An aeronautical telecommunication station having primary responsibility for handling communications pertaining to the operation and control of aircraft in a given area.

AIRMET INFORMATION — Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en route weather phenomena which may affect the safety of low-level aircraft operations and which was not already included in the forecast issued for low-level flights in the flight information region concerned or sub-area thereof.

AIRPLANE DESIGN GROUP (ADG) — A FAA classification of aircraft based on wingspan and tail height. When the aircraft wingspan and tail height fall in different groups, the larger group applies.

Group #	Tail Height	Wingspan
I	< 20 ft (< 6.1m)	< 49 ft (< 14.9m)
II	20 ft ≤ 30 ft (6.1m ≤ 9.1m)	49 ft ≤ 79 ft (14.9m ≤ 24.1m)
III	30 ft ≤ 45 ft (9.1m ≤ 13.7m)	79 ft ≤ 118 ft (24.1m ≤ 36m)

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Group #	Tail Height	Wingspan
IV	45 ft ≤ 60 ft (13.7m ≤ 18.3m)	118 ft ≤ 171 ft (36m ≤ 52m)
V	60 ft ≤ 66 ft (18.3m ≤ 20.1m)	171 ft ≤ 214 ft (52m ≤ 65m)
VI	66 ft ≤ 80 ft (20.1m ≤ 24.4m)	214 ft ≤ 262 ft (65m ≤ 80m)

AIRPORT — An area on land or water that is used or intended to be used for the landing and take-off of aircraft and includes its buildings and facilities, if any.

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 SURFACE DETECTION EQUIPMENT - MODEL X (ASDE-X) — A surveillance system using radar, aircraft transponders, satellites, and multilateration to track surface movements of aircraft and vehicles.

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.

AIRPROX — The code word used in an air traffic incident report to designate aircraft proximity.

AIR-REPORT — A report from an aircraft in flight prepared in conformity with requirements for position and operational and/or meteorological reporting.

NOTE: Details of the AIREP form are given in PANSATM (Doc 4444) and ATC section.

AIR-TAXIING — Movement of a helicopter/VTOL above the surface of an aerodrome, normally in ground effect and at a ground speed normally less than 20KT (37kmh).

NOTE: The actual height may vary, and some helicopters may require air-taxiing above 25ft (8m) AGL to reduce ground effect turbulence or provide clearance for cargo slingloads.

AIR-TO-GROUND COMMUNICATION — One-way communication from aircraft to stations or locations on the surface of the earth.

AIR TRAFFIC — All aircraft in flight or operating on the manoeuvring area of an aerodrome.

AIR TRAFFIC ADVISORY SERVICE — A service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans.

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

AIR TRAFFIC CONTROL CLEARANCE — Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

NOTE 1: For convenience, the term "air traffic control clearance" is frequently abbreviated to "clearance" when used in appropriate contexts.

NOTE 2: The abbreviated term "clearance" may be prefixed by the words "taxi," "take-off," "departure," "en route," "approach" or "landing" to indicate the particular portion of flight to which the air traffic control clearance relates.

AIR TRAFFIC CONTROL INSTRUCTION — Directives issued by air traffic control for the purpose of requiring a pilot to take a specific action.

AIR TRAFFIC CONTROL SERVICE — A service provided for the purpose of:

a. preventing collisions:
   1. between aircraft; and
   2. on the manoeuvring area between aircraft and obstructions; and
b. expediting and maintaining an orderly flow of air traffic.

AIR TRAFFIC CONTROL UNIT — A generic term meaning variously, area control centre, approach control office or aerodrome control tower.

AIR TRAFFIC SERVICE (ATS) — A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

AIR TRAFFIC SERVICES AIRSPACES — Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.

NOTE: ATS airspaces are classified as Class "A" to "G."

AIR TRAFFIC SERVICES REPORTING OFFICE — A unit established for the purpose of receiving reports concerning air traffic services and flight plans submitted before departure.

NOTE: An air traffic services reporting office may be established as a separate unit or combined with an existing unit, such as another air traffic services unit, or a unit of the aeronautical information service.

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.'

AIR TRAFFIC SERVICES UNIT — A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.

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

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

ALERFA — The code word used to designate an alert phase.

ALERT AREA (USA) — [see SPECIAL USE AIRSPACE (SUA)].

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

ALERT PHASE — A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

ALLOCATION, ALLOCATE — Distribution of frequencies, SSR Codes, etc. to a State, unit or service, Distribution of 24-bit aircraft addresses to a State or common mark registering authority.

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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.

ALPHANUMERIC CHARACTERS (Alphanumerics) — A collective term for letters and figures (digits).

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. Alternate aerodromes include the following:

Take-Off Alternate — An alternate aerodrome at which an aircraft can land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.

En Route Alternate — An aerodrome at which an aircraft would be able to land after experiencing an abnormal or emergency condition while en route.

Destination Alternate — An alternate aerodrome to which an aircraft may proceed should it become impossible or inadvisable to land at the aerodrome of intended landing.

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

ETOPS En Route Alternate — A suitable and appropriate alternate aerodrome at which an aeroplane would be able to land after experiencing an engine shutdown or other abnormal or emergency condition while en route in an ETOPS operation.

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).

QFE — The atmospheric pressure setting which, when set in the aircraft's altimeter, will cause the altimeter to read zero when at the reference datum of the airfield.

QNE — The constant atmospheric pressure related to a reference datum of 29.92 inches of mercury or 1013.25 hectopascals or 1013.25 millibars, used for expressing flight levels.

QNH — The atmospheric pressure setting which, when set in the aircraft's altimeter, will cause the altimeter to read altitudes referenced to mean sea level.

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

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

a. AGL Altitude — Altitude expressed in feet measured above ground level (QFE).
b. MSL Altitude — Altitude expressed in feet measured from mean sea level (QNH).
c. Indicated Altitude — The Altitude as shown by an altimeter. On a pressure barometric altimeter it is altitude as shown uncorrected for instrument error and uncompensated for variation from standard atmospheric conditions.

APPROACH BAN — An approach procedure, for which continuation is prohibited beyond a specific point, and or specified height, if the reported visibility or RVR is below the minimum specified for that approach.

APPROACH CONTROL OFFICE — A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

APPROACH CONTROL SERVICE — Air traffic control service for arriving or departing controlled flights.

APPROACH CONTROL UNIT — A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

APPROACH FUNNEL — A specified airspace around a nominal approach path within which an aircraft approaching to land is considered to be making a normal approach.

APPROACH PROCEDURE WITH VERTICAL GUIDANCE (APV) — [see INSTRUMENT APPROACH PROCEDURE (IAP)].

APPROACH SEQUENCE — The order in which two or more aircraft are cleared to approach to land at the aerodrome.

APPROPRIATE ATS AUTHORITY — The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned.

APPROPRIATE AUTHORITY —

a. **Regarding flight over the high seas:** The relevant authority of the State of Registry.
b. **Regarding flight other than over the high seas:** The relevant authority of the State having sovereignty over the territory being overflown.

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APRON — A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance.

ARC — (see Aerodrome Reference Code)

AREA CONTROL CENTRE — A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

AREA CONTROL SERVICE — Air traffic control service for controlled flights in control areas.

AREA MINIMUM ALTITUDE (AMA) — The minimum altitude to be used under instrument meteorological conditions (IMC), that provides a minimum obstacle clearance within a specified area, normally formed by parallels and meridians.

AREA NAVIGATION/RNAV — A method of navigation which permits aircraft operation on any desired flight path within the coverage of the station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

AREA NAVIGATION ROUTE — An ATS route established for the use of aircraft capable of employing area navigation.

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

ASSIGNMENT, ASSIGN — Distribution of frequencies to stations. Distribution of SSR Codes or 24-bit addresses to aircraft.

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 — A specified route designed for channeling the flow of traffic as necessary for the provision of air traffic services.

NOTE 1: The term "ATS route" is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.

NOTE 2: An ATS route is defined by route specifications which include an ATS route designator, the track to or from significant points (way-points), distance between significant points, reporting requirements and, as determined by the appropriate ATS authority, the lowest safe altitude.

ATS SURVEILLANCE SERVICE — A term used to indicate a service provided directly by means of an ATS surveillance system.

ATS SURVEILLANCE SYSTEM — A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.

NOTE: A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR.

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.

AUTOMATIC DEPENDENT SURVEILLANCE — BROADCAST (ADS-B) — A means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link.

AUTOMATIC DEPENDENT SURVEILLANCE — CONTRACT (ADS-C) — A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.

NOTE: The abbreviated term "ADS" contract is commonly used to refer to ADS event contract, ADS demand contract or an emergency mode.

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS) — The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

- Data link-automatic terminal information service (D-ATIS). The provision of ATIS via data link.
- Voice-automatic terminal information service (Voice-ATIS). The provision of ATIS by means of continuous and repetitive voice broadcasts.

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.

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AWOS-A	Only reports altimeter setting.
AWOS-A/V	Reports altimeter setting plus visibility.
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.

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BALKED LANDING — A landing manoeuvre that is unexpectedly discontinued below DA(H)/MDA(H) or beyond MAP.

BASE TURN — A turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. The tracks are not reciprocal.

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

BLIND TRANSMISSION — A transmission from one station to another station in circumstances where two-way communication cannot be established but where it is believed that the called station is able to receive the transmission.

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.

BRIEFING — Oral commentary on existing and/or expected conditions.

BROADCAST — A transmission of information relating to air navigation that is not addressed to a specific station or stations.

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 6000m (20,000ft) 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”.

CHANGE-OVER POINT — The point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft.

NOTE: Change-over points are established to provide the optimum balance in respect of signal strength and quality between facilities at all levels to be used and to ensure a common source of azimuth guidance for all aircraft operating along the same portion of a route segment.

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

CIRCLING APPROACH / CIRCLE-TO-LAND MANEUVER — An extension of an instrument approach procedure which provides for visual circling of the aerodrome prior to landing.

CLEARANCE LIMIT — The point to which an aircraft is granted an air traffic control clearance.

CLEARWAY — An area beyond the take-off runway under the control of airport authorities within which terrain or fixed obstacles may not extend above specified limits. These areas may be required for certain turbine-powered operations and the size and upward slope of the clearway will differ depending on when the aircraft was certified.

CLOUD OF OPERATIONAL SIGNIFICANCE — A cloud with the height of cloud base below 5000ft (1500m) or below the highest minimum sector altitude, whichever is greater, or a cumulonimbus cloud or a towering cumulus cloud at any height.

CODE (SSR CODE) — The number assigned to a particular multiple pulse reply signal transmitted by a transponder in Mode A or Mode C.

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.

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

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

COMPUTER — A device which performs sequences of arithmetical and logical steps upon data without human intervention.

NOTE: When the word "computer" is used in this document it may denote a computer complex, which includes one or more computers and peripheral equipment.

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 1500 for the 24 hour period starting at 0600 the next day.
Category 3:	Not plannable. Usable only when directed by ATC.

CONTINUOUS DESCENT FINAL APPROACH (CDFA) — CDFA is a technique for flying the final approach of a Non Precision Approach (NPA) as a continuous descent. The technique supports a stabilized approach procedure and has no level-off. A CDFA starts from an altitude/height at or above the FAF and proceeds to an altitude/height approximately 50 feet (15 meters) above the landing runway threshold or to a point where the flare maneuver should begin for the type of aircraft being flown.

NOTE: CDFAs with advisory VNAV guidance calculated by on-board equipment are considered 3D operations. CDFAs with manual calculations of the required rate of descent are considered 2D operations.

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

CONTROLLED AERODROME — An aerodrome at which air traffic control service is provided to aerodrome traffic.

NOTE: The term "controlled aerodrome" indicates that air traffic control service is provided to aerodrome traffic but does not necessarily imply that a control zone exists.

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".

CONTROLLED FIRING AREA (USA) — [see SPECIAL USE AIRSPACE (SUA)].

CONTROLLED FLIGHT — Any flight which is subject to an air traffic control clearance.

CONTROLLER-PILOT DATA LINK COMMUNICATIONS (CPDLC) — A means of communication between controller and pilot, using data link for ATC communications.

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

COURSE —

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

CRITICAL DME — A critical Distance Measuring Equipment (DME) is a DME facility that, when not available, results in navigation service which is not sufficient for DME/DME/IRU operations along all or portions of a specific route or procedure.

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.

CRUISE CLIMB — An aeroplane cruising technique resulting in a net increase in altitude as the aeroplane mass decreases.

CRUISING LEVEL — A level maintained during a significant portion of a flight.

CURRENT FLIGHT PLAN (CPL) — The flight plan, including changes, if any, brought about by subsequent clearances.

DANGER AREA (ICAO) — [see SPECIAL USE AIRSPACE (SUA)].

DATA CONVENTION — An agreed set of rules governing the manner or sequence in which a set of data may be combined into a meaningful communication.

DATA LINK COMMUNICATIONS — A form of communication intended for the exchange of messages via a data link.

DATA LINK INITIATION CAPABILITY (DLIC) — A data link application that provides the ability to exchange addresses, names and version numbers necessary to initiate data link applications.

DEAD RECKONING (DR) NAVIGATION — The estimating or determining of position by advancing an earlier known position by the application of direction, time and speed data.

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

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NOTE:

a. Decision altitude (DA) is referenced to mean sea level (MSL) and decision height (DH) is referenced to the threshold elevation.

b. The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.

c. For convenience where both expressions are used they may be written in the form "decision altitude/height" and abbreviated "DA/H."

DECISION ALTITUDE/HEIGHT (DA/H) (FAA) — Is a specified altitude/height in an instrument approach procedure at which the pilot must decide whether to initiate an immediate missed approach if the pilot does not see the required visual reference, or to continue the approach. Decision altitude/height is expressed in feet above mean sea level/ground level.

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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 1440ft (200ft is a Decision Altitude of 1440ft and a Decision Height of 200ft.

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

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

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

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

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

DEPENDENT PARALLEL APPROACHES — Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are prescribed.

DETRESFA — The code word used to designate a distress phase.

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

DISCRETE CODE — A four-digit SSR Code with the last two digits not being "00."

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

DISTRESS — A condition of being threatened by serious and/or imminent danger and of requiring immediate assistance.

DISTRESS PHASE — A situation wherein there is a reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

DME DISTANCE — The line of sight distance (slant range) from the source of a DME signal to the receiving antenna.

DME GAP — A Distance Measuring Equipment (DME) Gap is the distance where there is lack of DME signal reception for the designated DME facility on the course being flown.

EFFECTIVE DATE/TIME —

FAA and Canada: Aeronautical information in the U.S. and its territories is generally effective on the designated effective date at 09:01 Coordinated Universal Time (UTC). The effective time applies to airspace, airways and flight procedures. It allows for implementation between 01:00 and 06:00 local standard time in the U.S. Local authorities may change the date or time of implementation due to local operational considerations. Check NOTAMs and contact local ATC for information.

International: The International Civil Aviation Organization (ICAO) guidance specifies that aeronautical information should be effective on the designated effective date at 00:00 Coordinated Universal Time (UTC). However national and local authorities often change the effective time to allow for implementation during the local night or at other times due to local operational considerations. When an effective time other than 00:00 UTC is used, ICAO requires that it be published in the official Aeronautical Information Publication (AIP) of the country. Check NOTAMs and contact local ATC for information.

ELEVATION — The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level.

EMERGENCY PHASE — A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase.

ENGINEERED MATERIALS ARRESTING SYSTEM (EMAS) — High-energy-absorbing material located in the runway overrun that is designed to crush under the weight of an aircraft as the material exerts deceleration forces on the aircraft landing gear.

ENROUTE FLIGHT ADVISORY SERVICE (FLIGHT WATCH) — A service specifically designed to provide, upon pilot request, timely weather information

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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.

ESTIMATED ELAPSED TIME — The estimated time required to proceed from one significant point to another.

ESTIMATED OFF-BLOCK TIME — The estimated time at which the aircraft will commence movement associated with departure.

ESTIMATED TIME OF ARRIVAL — For IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome. For VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome.

EXPECTED APPROACH TIME — The time at which ATC expects that an arriving aircraft, following a delay, will leave the holding point to complete its approach for a landing.

NOTE: The actual time of leaving the holding point will depend upon the approach clearance.

EXTENDED OPERATION (ETOPS) — Any flight by an aeroplane with two turbine power-units where the flight time at the one power-unit inoperative cruise speed (in ISA and still air conditions), from a point on the route to an adequate alternate aerodrome, is greater than the threshold time approved by the State of the Operator.

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).

FILED FLIGHT PLAN (FPL) — The flight plan as filed with an ATS unit by the pilot or a designated representative, without any subsequent changes.

FINAL APPROACH COURSE — A bearing/radial/track of an instrument approach leading to a runway or an extended runway centerline all without regard to distance.

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

a. at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
b. at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:
   1. a landing can be made; or
   2. a missed approach procedure is initiated.

FINAL APPROACH AND TAKE-OFF AREA (FATO) — A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by performance Class 1 helicopters, the defined area includes the rejected take-off area available.

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

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 circling approach/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 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.

FINAL APPROACH SEGMENT (FAS) — That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

FLIGHT CREW MEMBER — A licensed crew member charged with duties essential to the operation of an aircraft during flight time.

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FLIGHT DOCUMENTATION — Written or printed documents, including charts or forms, containing meteorological information for a flight.

FLIGHT INFORMATION CENTRE — A unit established to provide flight information service and alerting service.

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.

FLIGHT LEVEL (FL) — A surface of constant atmospheric pressure which is related to a specific pressure datum, 1013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

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NOTE 1: A pressure type altimeter calibrated in accordance with the Standard Atmosphere:

a. when set to a QNH altimeter setting, will indicate altitude;

b. when set to a QFE altimeter setting, will indicate height above the QFE reference datum;

c. when set to a pressure of 1013.2 hectopascals (hPa), may be used to indicate flight levels.

NOTE 2: The terms "height" and "altitude," used in NOTE 1 above, indicate altimetric rather than geometric heights and altitudes.

FLIGHT PATH MONITORING — The use of ATS surveillance systems for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path, including deviations from the terms of their air traffic control clearances.

NOTE: Some applications may require a specific technology, e.g. radar, to support the function of flight path monitoring.

FLIGHT PLAN — Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.

NOTE: Specifications for flight plans are contained in ICAO Rules of the Air, Annex 2. A Model Flight Form is contained in ICAO Rules of the Air and Air Traffic Services, PANS-RAC (Doc 4444), Appendix 2 and ATC section.

FLIGHT VISIBILITY — The visibility forward from the cockpit of an aircraft in flight.

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."

FLOW CONTROL — Measures designed to adjust the flow of traffic into a given airspace, along a given route, or bound for a given aerodrome, so as to ensure the most effective utilization of the airspace.

FORECAST — A statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace.

GAMET AREA FORECAST — An area forecast in abbreviated plain language for low-level flights for a flight information region or sub-area thereof, prepared by the meteorological office designated by the meteorological authority concerned and exchanged with meteorological offices in adjacent flight information regions, as agreed between the meteorological authorities concerned.

GBAS-LANDING SYSTEM (GLS) — A system for Approach and Landing operations utilizing GNSS, augmented by a Ground-Based Augmentation System (GBAS), as the primary navigational reference.

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

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

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

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

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

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

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.

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

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

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

GRID POINT DATA IN DIGITAL FORM — Computer processed meteorological data for a set of regularly spaced points on a chart, for transmission from a meteorological computer to another computer in a code form suitable for automated use.

NOTE: In most cases such data are transmitted on medium or high speed telecommunications channels.

GRIP-FLEX MICRO-SURFACING — A thermoplastic compound that uses highly refined, environmentally safe coal tar derivative for anti-oxidation and fuel-resistance qualities to create a stable wearing surface for pavements.

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 take-off. 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.

GROUND EFFECT — A condition of improved performance (lift) due to the interference of the surface with the airflow pattern of the rotor system when a helicopter or other VTOL aircraft is operating near the ground.

NOTE: Rotor efficiency is increased by ground effect to a height of about one rotor diameter for most helicopters.

GROUND VISIBILITY — The visibility at an aerodrome, as reported by an accredited observer.

HEADING — The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, compass or grid).

HEIGHT — The vertical distance of a level, a point or an object considered as a point, measured from a specified datum.

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 30MHz 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 60KT), 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.

HOLDING FIX, HOLDING POINT — A specified location, identified by visual or other means, in the vicinity of which the position of an aircraft in flight is maintained in accordance with air traffic control clearances.

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.

HOT SPOT — A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

HUMAN FACTORS PRINCIPLES — Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

HUMAN PERFORMANCE — Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

IFR FLIGHT — A flight conducted in accordance with the instrument flight rules.

ILS CATEGORIES (ICAO) —

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

b. ILS Category II (Special authorization required) — An ILS approach procedure which provides for an approach to a decision height lower than 60m (200ft) but not lower than 30m (100ft) and a runway visual range not less than 300m

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(1000ft) for aircraft categories A, B, C (D with auto landing), and not less than 350m (1200ft) for aircraft category D without auto landing.

c. ILS Category III (Special authorization required) —

1. IIIA — An ILS approach procedure which provides for approach with either a decision height lower than 30m (100ft) or with no decision height and with a runway visual range of not less than 175m (574ft).
2. IIIB — An ILS approach procedure which provides for approach with either a decision height lower than 15m (50ft) or with no decision height and with a runway visual range of less than 175m (574ft) but not less than 50m (150ft).
3. IIIC — An ILS approach procedure which provides for approach with no decision height and no runway visual range limitations.

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

ILS CATEGORIES (USA) —

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

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

c. ILS Category III —

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

INCERFA — The code word used to designate an uncertainty phase.

INDEPENDENT PARALLEL APPROACHES — Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are not prescribed.

INDEPENDENT PARALLEL DEPARTURES — Simultaneous departures from parallel or near-parallel instrument runways.

INITIAL APPROACH FIX (IAF) — A fix that marks the beginning of the initial segment and the end of the arrival segment, if applicable. In RNAV applications this fix is normally defined by a fly-by waypoint.

INITIAL APPROACH SEGMENT — 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.

INSTRUMENT APPROACH PROCEDURE (IAP) — A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

– Non-precision approach (NPA) procedure. An instrument approach procedure which utilizes lateral guidance but does not utilize vertical guidance.
– 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.
– Precision approach (PA) procedure. An instrument approach procedure using precision lateral and vertical guidance with minima as determined by the category of operation.

NOTE: Lateral and vertical guidance refers to the guidance provided either by:

a. a ground-based navigation aid; or
b. computer-generated navigation data.

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.

INSTRUMENT METEOROLOGICAL CONDITIONS (IMC) — Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions.

NOTE 1: The specified minima for visual meteorological conditions are contained in ICAO Rules of the Air, Annex 2, Chapter 4.

NOTE 2: In a control zone, a VFR flight may proceed under instrument meteorological conditions if and as authorized by air traffic control.

INTERMEDIATE APPROACH SEGMENT — 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, racetrack or dead reckoning track procedure and the final approach fix or point, as appropriate.

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GLOSSARY

INTERMEDIATE FIX (IF) — A fix that marks the end of an initial segment and the beginning of the intermediate segment. In RNAV applications this fix is normally defined by a fly-by waypoint.

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

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

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

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

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

INTERNATIONAL AIRWAYS VOLCANO WATCH (IAVW) — International arrangements for monitoring and providing warnings to aircraft of volcanic ash in the atmosphere.

NOTE: The IAVW is based on the co-operation of aviation and non-aviation operational units using information derived from observing sources and networks that are provided by States. The watch is coordinated by ICAO with the co-operation of other concerned international organizations.

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 (LAHSO) — Operations which include simultaneous take-offs and landings and/or simultaneous landings when a landing aircraft is able and is instructed by the controller to hold short of the intersecting runway / taxiway or designated hold short point. Pilots are expected to promptly inform the controller if the hold short clearance cannot be accepted.

LANDING AREA — That part of a movement area intended for the landing or take-off of aircraft.

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) — Provides the same level of service as the present GPS standalone 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.

LEVEL — A generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level.

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. The label LPV denotes minima lines associated with APV-I or APV-II performance on approach charts.

LOCATION INDICATOR — A four-letter code group formulated in accordance with rules prescribed by ICAO and assigned to the location of an aeronautical fixed station.

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

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

MAGNETIC VARIATION (VAR) — 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.

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GLOSSARY

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 5NM 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 5NM.

MANOEUVRING AREA — That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

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

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

METEOROLOGICAL AUTHORITY — The authority providing or arranging for the provision of meteorological service for international air navigation on behalf of a Contracting State.

METEOROLOGICAL BULLETIN — A text comprising meteorological information preceded by an appropriate heading.

METEOROLOGICAL INFORMATION — Meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions.

METEOROLOGICAL OFFICE — An office designated to provide meteorological service for international air navigation.

METEOROLOGICAL REPORT — A statement of observed meteorological conditions related to a specified time and location.

METEOROLOGICAL SATELLITE — An artificial earth satellite making meteorological observations and transmitting these observations to earth.

MILITARY OPERATIONS AREA (MOA) (USA) — [see SPECIAL USE AIRSPACE (SUA)].

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 (MDA) (FAA) — Is the lowest altitude specified in an instrument approach procedure, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering until the pilot sees the required visual references for the heliport or runway of intended landing.

MINIMUM DESCENT ALTITUDE (MDA) OR MINIMUM DESCENT HEIGHT (MDH) (ICAO) — A specified altitude or height in a non-precision approach or circling approach below which descent must not be made without the required visual reference.

NOTE 1: Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 2m (7ft) below the aerodrome elevation. A minimum descent height for a circling approach is referenced to the aerodrome elevation.

NOTE 2: 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. In the case of a circling approach the required visual reference is the runway environment.

NOTE 3: For convenience when both expressions are used they may be written in the form "minimum descent altitude/height" abbreviated "MDA/H."

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

MINIMUM FUEL — The term used to describe a situation in which an aircraft's fuel supply has reached a state where little or no delay can be accepted.

NOTE: This is not an emergency situation but merely indicates that an emergency situation is possible, should any undue delay occur.

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

a. In designated mountainous areas, 2000ft above the highest obstacle within a horizontal distance of 4NM from the course to be flown; or
b. Other than mountainous areas, 1000ft above the highest obstacle within a horizontal distance of 4NM from the course to be flown; or
c. As otherwise authorized by the Administrator or assigned by ATC.

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

MINIMUM OFF-ROUTE ALTITUDE (MORA) — This is an altitude derived by Jeppesen. The MORA provides known obstruction clearance 10NM either side of the route centerline including a 10NM 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/SECTOR ALTITUDE (MSA) (FAA) — Altitude depicted on an instrument chart and identified as the minimum safe altitude which

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provides 1000ft of obstacle clearance within a 25NM radius from the navigational facility upon which the MSA is predicated. If the radius limit is other than 25NM, it is stated. This altitude is for EMERGENCY USE ONLY and does not necessarily guarantee navaid reception. When the MSA is divided into sectors, with each sector a different altitude, the altitudes in these sectors are referred to as “minimum sector altitudes”.

MINIMUM SECTOR ALTITUDE (MSA) (ICAO) — The lowest altitude which may be used which will provide a minimum clearance of 300m (1000ft) above all objects located in an area contained within a sector of a circle of 46km (25NM) radius centered on a radio aid to navigation.

MINIMUM STABILIZATION DISTANCE (MSD) — The minimum distance to complete a turn manoeuvre and after which a new manoeuvre can be initiated. The minimum stabilization distance is used to compute the minimum distance between waypoints.

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.

MISSED APPROACH —

a. A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. The route of flight and altitude are shown on instrument approach procedure charts. A pilot executing a missed approach prior to the Missed Approach Point (MAP) must continue along the final approach to the MAP. The pilot may climb immediately to the altitude specified in the missed approach procedure.
b. A term used by the pilot to inform ATC that he/she is executing the missed approach.
c. At locations where ATC radar service is provided the pilot should conform to radar vectors, when provided by ATC, in lieu of the published missed approach procedure.

MISSED APPROACH HOLDING FIX (MAHF) — A fix used in RNAV applications that marks the end of the missed approach segment and the centre point for the missed approach holding.

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

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

MISSED APPROACH PROCEDURE — The procedure to be followed if the approach cannot be continued.

MODE (SSR) — The conventional identifier related to specific functions of the interrogation signals transmitted by an SSR interrogator. There are four modes specified in ICAO Annex 10 (not published herein): A, C, S and intermode.

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

MOVEMENT AREA — That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).

NEAR-PARALLEL RUNWAYS — Non-intersecting runways whose extended centre lines have an angle of convergence/divergence of 15 degrees or less.

NON PRECISION APPROACH (NPA) PROCEDURE — [see INSTRUMENT APPROACH PROCEDURE (IAP)]

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

NORMAL OPERATING ZONE (NOZ) — Airspace of defined dimensions extending to either side of an ILS localizer course and/or MLS final approach track. Only the inner half of the normal operating zone is taken into account in independent parallel approaches.

NOTAM (ICAO) — A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

NO-TRANSGRESSION ZONE (NTZ) — In the context of independent parallel approaches, a corridor of airspace of defined dimensions located centrally between the two extended runway centre lines, where a penetration by an aircraft requires a controller intervention to manoeuvre any threatened aircraft on the adjacent approach.

OBSERVATION (METEOROLOGICAL) — The evaluation of one or more meteorological elements.

OBSTACLE ASSESSMENT SURFACE (OAS) — A defined surface intended for the purpose of determining those obstacles to be considered in the calculation of obstacle clearance altitude/height for a specific APV or precision approach procedure.

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

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GLOSSARY

NOTE 1: Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches to the aerodrome elevation or the threshold elevation if that is more than 7ft (2m) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.

NOTE 2: For convenience when both expressions are used they may be written in the form "obstacle clearance altitude/height" and abbreviated "OCA/H."

OBSTACLE FREE ZONE (OFZ) (ICAO) — The airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.

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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.

OPERATIONAL CONTROL — The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

OPERATOR — A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

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 15min (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 15min lighting duration is available.

PILOT-IN-COMMAND (PIC) — The pilot responsible for the operation and safety of the aircraft during flight time.

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.

POINT-IN-SPACE APPROACH (PinS) — The point-in-space approach is based on a basic GNSS non-precision approach procedure designed for helicopters only. It is aligned with a reference point located to permit subsequent flight manoeuvring or approach and landing using visual manoeuvring in adequate visual conditions to see and avoid obstacles.

POINT-IN-SPACE REFERENCE POINT (PRP) — Reference point for the point-in-space approach as identified by the latitude and longitude of the MAPt.

PRECISION APPROACH (PA) PROCEDURE — [see INSTRUMENT APPROACH PROCEDURE (IAP)].

PRECISION APPROACH RADAR (PAR) — Primary radar equipment used to determine the position of an aircraft during final approach, in terms of lateral and vertical deviations relative to a nominal approach path, and in range relative to touchdown.

NOTE: Precision approach radars are designated to enable pilots of aircraft to be given guidance by radio communication during the final stages of the approach to land.

PRECISION OBJECT FREE ZONE (POFZ) (FAA) — A volume of airspace above an area beginning at the runway threshold, at the threshold elevation, and entered on the extended runway centerline. The standard POFZ is 200ft (60m) long and 800ft (240m) wide. The POFZ must be kept clear when an aircraft on a vertically guided final approach is within two nautical miles (NM) of the runway threshold and the reported ceiling is below 250ft and/or visibility less than ¾ statute miles (SM) (or runway visual range below 4000ft). The POFZ is considered clear even if the wing of the aircraft holding on a taxiway waiting for runway clearance penetrates the POFZ; however, neither the fuselage nor the tail may infringe on the POFZ. For approaching aircraft, in the event that a taxiing/parked aircraft or vehicle is not clear of the POFZ, air traffic control will provide advisories to the approaching aircraft regarding the position of the offending aircraft/vehicle. In this case the pilot of the approaching aircraft must decide to continue or abort the approach. When the reported ceiling is below 800ft or visibility less than 2SM, departing aircraft must do the following. When there is an air traffic control tower (ATCT) in operation, plan to hold at the ILS hold line and hold as directed by air traffic control. When there is no operating ATCT, honor the

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ILS hold line and do not taxi into position and take-off if there is an approaching aircraft within 2NM of the runway threshold.

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.

PRESSURE ALTITUDE — An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere.

PREVAILING VISIBILITY — The greatest visibility value, observed in accordance with the definition "visibility", which is reached within at least half the horizon circle or within at least half of the surface of the aerodrome. These areas could comprise contiguous or non-contiguous sectors.

NOTE: This value may be assessed by human observation and/or instrumented systems. When instruments are installed, they are used to obtain the best estimate of the prevailing visibility.

PRIMARY AREA — A defined area symmetrically disposed about the nominal flight track in which full obstacle clearance is provided. (See also **SECONDARY AREA**.)

PRIMARY RADAR — A radar system which uses reflected radio signals.

PRIMARY SURVEILLANCE RADAR (PSR) — A surveillance radar system which uses reflected radio signals.

PROCEDURE ALTITUDE/HEIGHT — Are recommended altitudes/heights developed in coordination with Air Traffic Control requirements flown operationally at or above the minimum altitude/height and established to accommodate a stabilized descent at a prescribed descent gradient/angle in the intermediate/final approach segment. Procedure altitudes/heights are never below the Segment Minimum Altitude (SMA) or Segment Minimum Safe Altitude (SMSA).

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

NOTE 2: Procedure turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual 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.

PROFILE — The orthogonal projection of a flight path or portion thereof on the vertical surface containing the nominal track.

PROGNOSTIC CHART — A forecast of a specified meteorological element(s) for a specified time or period and a specified surface or portion of airspace, depicted graphically on a chart.

PROHIBITED AREA (ICAO) (USA) — [see SPECIAL USE AIRSPACE (SUA)].

QFE — [see ALTIMETER SETTING]

QNE — [see ALTIMETER SETTING]

QNH — [see ALTIMETER SETTING]

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 — A radio detection device which provides information on range, azimuth and/or elevation of objects.

RADAR APPROACH — An approach, executed by an aircraft, under the direction of a radar controller.

RADAR CONTACT — The situation which exists when the radar position of a particular aircraft is seen and identified on a radar display.

RADAR SEPARATION — The separation used when aircraft position information is derived from radar sources.

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.

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RADIOTELEPHONY — A form of radio communication primarily intended for the exchange of information in the form of speech.

RADIOTELEPHONY NETWORK — A group of radiotelephony aeronautical stations which operate on and guard frequencies from the same family and which support each other in a defined manner to ensure maximum dependability of air-ground communications and dissemination of air-ground traffic.

REDUCED VERTICAL SEPARATION MINIMUMS (RVSM) — A reduction in the vertical separation between FL290 – FL410 from 2000ft to 1000ft.

REGIONAL AIR NAVIGATION AGREEMENT — Agreement approved by the Council of ICAO normally on the advice of a regional air navigation meeting.

REPETITIVE FLIGHT PLAN (RPL) — A flight plan related to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units.

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REPORTING POINT — A specified geographical location in relation to which the position of an aircraft can be reported.

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.

On FAA RNAV (RNP) charts, any requirement/capability notes are depicted below the fix/waypoint/NAVAID name. When the required RNP lateral accuracy value for any approach segment other than final approach (e.g. feeder, initial and/or 2 intermediate or missed) are less than standard (RNP 2.00 for feeder, RNP 1.00 for initial and/or intermediate and missed), a note stating the required RNP value may be placed adjacent to the applicable fix at the beginning of the Feeder Route (or charted in the PBN box). If there is more than one lateral accuracy value within these portions of the procedure, the lowest value is charted. These notes will take the form “RNP 0.XX, or Min RNP 0.XX” and will be located in close proximity to the relevant fix name (or be identified in the PBN Box).

RESCUE COORDINATION CENTER — A unit responsible for promoting efficient organization of search and rescue service and for coordinating the conduct of search and rescue operations within a search and rescue region.

RESCUE UNIT — A unit composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue.

RESTRICTED AREA (ICAO) (USA) — [see SPECIAL USE AIRSPACE (SUA)].

REVERSAL PROCEDURE — A procedure designed to enable aircraft to reverse direction during the initial approach segment of an instrument approach procedure. The sequence may include procedure turns or base turns.

REVISION DATE — Charts revisions are issued on Fridays. Charts are considered effective (usable) upon receipt. With regard to the coverages, charts are issued weekly or bi-weekly.

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

RNP TYPE — A containment value expressed as a distance in nautical miles from the intended position within which flights would be for at least 95 percent of the total flying time.

EXAMPLE: RNP 4 represents a navigation accuracy of plus or minus 7.4km (4NM) on a 95 percent containment basis.

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

RUNWAY — A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

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

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

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

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

a. The runway edge lights are white, except on instrument runways amber replaces white on the last 2000ft or half of the runway length, whichever is less, to form a caution zone for landings.
b. The lights marking the ends of the runway emit red light toward the runway to indicate the end of runway to a departing aircraft and emit green outward from the runway end to indicate the threshold to landing aircraft.

RUNWAY HOLDING POSITION — A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower.

NOTE: In radiotelephony phraseologies, the expression "holding point" is used to designate the runway holding position.

RUNWAY INCURSION — Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.

RUNWAY MARKINGS —

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

RUNWAY STRIP — A defined area including the runway and stopway, if provided, intended:

a. to reduce the risk of damage to aircraft running off a runway; and
b. to protect aircraft flying over it during take-off or landing operations.

RUNWAY VISUAL RANGE (RVR) — The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

SAFETY-SENSITIVE PERSONNEL — Persons who might endanger aviation safety if they perform their duties and functions improperly including, but not limited to, crew members, aircraft maintenance personnel and air traffic controllers.

SEARCH AND RESCUE SERVICES UNIT — A generic term meaning, as the case may be, rescue coordination center, rescue subcenter or alerting post.

SECONDARY AREA — A defined area on each side of the primary area located along the nominal flight track in which decreasing obstacle clearance is provided. (See also **PRIMARY AREA**).

SECONDARY RADAR — A radar system wherein a radio signal transmitted from a radar station initiates the transmission of a radio signal from another station.

SECONDARY SURVEILLANCE RADAR (SSR) — A surveillance radar system which uses transmitters/receivers (interrogators) and transponders.

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

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

ICAO —

a. Initial Approach — That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.
b. Intermediate Approach — That segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, race track or dead reckoning track procedure and the final approach fix or point, as appropriate.
c. Final Approach — That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.
d. Missed Approach Procedure — The procedure to be followed if the approach cannot be continued.

USA —

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

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

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

SEGREGATED PARALLEL OPERATIONS — Simultaneous operations on parallel or near-parallel instrument runways in which one runway is used exclusively for approaches and the other runway is used exclusively for departures.

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

SHORELINE — A line following the general contour of the shore, except that in cases of inlets or bays less than 30NM in width, the line shall pass directly across the inlet or bay to intersect the general contour on the opposite side.

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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 1200ft to either side of the runway to which the instrument approach was conducted.

SIGMET INFORMATION — Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en route weather phenomena which may affect the safety of aircraft operations.

SIGNAL AREA — An area on an aerodrome used for the display of ground signals.

SIGNIFICANT POINT — A specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes.

NOTE: There are three categories of significant points: ground-based navigation aid, intersection and waypoint. In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground-based navigation aids.

SLUSH — Water-saturated snow which with a heel-and-toe slap-down motion against the ground will be displaced with a splatter; specific gravity: 0.5 up to 0.8.

NOTE: Combinations of ice, snow and/or standing water may, especially when rain, rain and snow, or snow is falling, produce substances with specific gravities in excess of 0.8. These substances, due to their high water/ice content, will have a transparent rather than a cloudy appearance and, at the higher specific gravities, will be readily distinguishable from slush.

SNOW (on the ground) —

a. Dry snow. Snow which can be blown if loose or, if compacted by hand, will fall apart upon release; specific gravity: up to but not including 0.35.

b. Wet snow. Snow which, if compacted by hand, will stick together and tend to or form a snowball; specific gravity: 0.35 up to but not including 0.5.

c. Compacted snow. Snow which has been compressed into a solid mass that resists further compression and will hold together or break up into lumps if picked up; specific gravity: 0.5 and over.

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

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

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

c. Danger Area (ICAO) — An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

d. 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.

e. Prohibited Area (ICAO) — An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

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

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

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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.

g. Warning Area (USA) — A warning area is airspace of defined dimensions from 3NM 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.

SPECIAL VFR FLIGHT — A VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.

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 ISOBARIC SURFACE — An isobaric surface used on a world-wide basis for representing and analyzing the conditions in the atmosphere.

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.

STOPWAY — A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

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.

SURVEILLANCE RADAR — Radar equipment used to determine the position of an aircraft in range and azimuth.

TAKE-OFF DISTANCE AVAILABLE (TODA) (ICAO) — The length of the take-off 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.

TAXIING — Movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.

TAXIWAY — A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

Aircraft Stand Taxilane — A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.

Apron Taxiway — A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron.

Rapid Exit Taxiway — A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxi-ways and thereby minimizing runway occupancy times.

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 ARRIVAL ALTITUDE (TAA) (ICAO) — Provides a seamless and efficient transition from the enroute structure to the terminal environment to an underly-

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

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

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

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

THRESHOLD CROSSING HEIGHT (TCH) — The theoretical height above the runway threshold at which the aircraft's glide slope antenna (or equivalent position) would be if the aircraft maintains the trajectory of the ILS glide slope, MLS glide path or charted descent angle.

TOTAL ESTIMATED ELAPSED TIME — For IFR flights, the estimated time required from take-off to arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the destination aerodrome, to arrive over the destination aerodrome. For VFR flights, the estimated time required from take-off to arrive over the destination aerodrome.

TOUCHDOWN — The point where the nominal glide path intercepts the runway.

NOTE: “Touchdown” as defined above is only a datum and is not necessarily the actual point at which the aircraft will touch the runway.

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

TRACK — The projection on the earth’s surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid).

TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS) — An airborne collision avoidance system based on radar beacon signals which operates independent of ground-based equipment.

TCAS-I generates traffic advisory only;

TCAS-II generates traffic advisories, and resolution (collision avoidance) advisories in the vertical plane.

TRAFFIC AVOIDANCE ADVICE — Advice provided by an air traffic services unit specifying manoeuvres to assist a pilot to avoid a collision.

TRAFFIC INFORMATION — Information issued by an air traffic services unit to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision.

TRANSITION ALTITUDE (TA) — 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 — 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 depart-

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ing 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 (TL) — The lowest flight level available for use above the transition altitude.

TROPICAL CYCLONE — Generic term for a non-frontal synoptic-scale cyclone originating over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation.

TROPICAL CYCLONE ADVISORY CENTRE (TCAC) — A meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, world area forecast centres and international OPMET databanks regarding the position, forecast direction and speed of movement, central pressure and maximum surface wind of tropical cyclones.

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.

UNCERTAINTY PHASE — A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

UNMANNED FREE BALLOON — A non-power-driven, unmanned, lighter-than-air aircraft in free flight.

NOTE: Unmanned free balloons are classified as heavy, medium or light in accordance with specifications contained in ICAO Rules of the Air, Annex 2, Appendix 4.

UPPER-AIR CHART — A meteorological chart relating to a specified upper-air surface or layer of the atmosphere.

URGENCY — A condition concerning the safety of an aircraft or other vehicle, or of some person on board or within sight, but which does not require immediate assistance.

VECTORING — Provision of navigational guidance to aircraft in the form of specific headings, based on the use of an ATS surveillance system.

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

VERTICAL PATH ANGLE (VPA) (ICAO) — Angle of the published final approach descent in Baro-VNAV procedures.

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.)

VERY HIGH FREQUENCY (VHF) — The frequencies between 30MHz and 300MHz (200MHz – 3GHz is considered as UHF in the Aviation).

VFR FLIGHT — A flight conducted in accordance with the visual flight rules.

VIBAL — (Visibilité Balise) Is the method whereby a human observer (or pilot in take-off position) determines the RVR by counting specific markers adjacent to the runway or by counting runway edge lights.

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

a. Flight Visibility — The visibility forward from the cockpit of an aircraft in flight.
b. Ground Visibility — The visibility at an aerodrome as reported by an accredited observer.
c. Runway Visual Range (RVR) — The range over which the pilot of an aircraft on the centerline of a runway can see the runway surface markings or the lights delineating the runway or identifying its centerline.

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

a. Flight Visibility — The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.
b. Ground Visibility — Prevailing horizontal visibility near the earth's surface as reported by the United States National Weather Service or an accredited observer.
c. Prevailing Visibility — The greatest horizontal visibility equaled or exceeded throughout at least half the horizon circle which need not necessarily be continuous.
d. Runway Visibility Value (RVV) — The visibility determined for a particular runway by a transmissometer. A meter provides a continuous indication of the visibility (reported in miles or fractions of miles) for the runway. RVV is used in lieu of prevailing visibility in determining minimums for a particular runway.
e. Runway Visual Range (RVR) — An instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end; it is based on the sighting of either high intensity runway lights or on the visual contrast of other targets whichever yields the greater visual range. RVR, in contrast to prevailing or runway visibility, is based on what a pilot in a moving aircraft should see looking down the runway. RVR is horizontal visual range, not slant visual range. It is based on the measurement of a transmissometer made near the touchdown point of the instrument runway and is reported in hundreds of feet. RVR is used in lieu of RVV and/or prevailing visibility in determining minimums for a particular runway.

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GLOSSARY

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.
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 1000ft and visibility of 3 miles or greater.

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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.

VISUAL MANOEUVRING (CIRCLING) AREA — The area in which obstacle clearance should be taken into consideration for aircraft carrying out a circling approach.

VISUAL METEOROLOGICAL CONDITIONS (VMC) — Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling equal to or better than specified minima.

NOTE: The specified minima are contained in ICAO Rules of the Air, Annex 2, Chapter 4.

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

VOLCANIC ASH ADVISORY CENTRE (VAAC) — A meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, area control centres, flight information centres, world area forecast centres, relevant regional area forecast centres and international OPMET data banks regarding the lateral and vertical extent and forecast movement of volcanic ash in the atmosphere following volcanic eruptions.

VOLMET BROADCAST — Provision of current aerodrome meteorological reports (METAR) and special meteorological reports (SPECI), aerodrome forecasts (TAF), SIGMET by means of continuous and repetitive voice broadcasts for aircraft in flight.

VOLMET DATA LINK SERVICE (D-VOLMET) — Provision of current METAR, SPECI, TAF, SIGMET, special air-reports not covered by SIGMET and, where available, AIRMET via data link.

WARNING AREA (USA) — [see SPECIAL USE AIRSPACE (SUA)].

WAYPOINT — A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:

Fly-by waypoint — A fly-by waypoint requires the use of turn anticipation to avoid overshoot of the next flight segment; or

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.

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.

WIDE AREA AUGMENTATION SYSTEM (WAAS) — WAAS is a navigation system developed for civil aviation that provides extremely accurate horizontal and vertical navigation for all classes of aircraft in all phases of flight - including enroute navigation, airport departures, and airport arrivals. This includes vertically-guided landing approaches in instrument meteorological conditions at all qualified locations.

WORLD AREA FORECAST CENTRE (WAFC) — A meteorological centre designated to prepare and issue significant weather forecasts and upper-air forecasts in digital and/or pictorial form on a global basis direct States by appropriate means as part of the aeronautical fixed service.

WORLD AREA FORECAST SYSTEM (WAFS) — A world-wide system by which world area forecast centres provide aeronautical meteorological en-route forecasts in uniform standardized formats.

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ABBREVIATIONS USED IN AIRWAY MANUAL

DEFINITIONS

A/A	Air to Air
AAF	Army Air Field
AAIM	Aircraft Autonomous Integrity Monitoring
AAIS	Automated Aerodrome Information Service
AAL	Above Aerodrome Level
AAS	Airport Advisory Service
AAU	Authorized Approach UNICOM
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
ADNL	Additional
ADR	Advisory Route
ADS	Automatic Dependent Surveillance
ADS-B	Automatic Dependent Surveillance-Broadcast
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
AFIS	Automatic Flight Information Services (FAA)
AFLD	Airfield
AFN	American Forces Network
AFRS	Armed Forces Radio Stations
AFRU	Aerodrome Frequency Response Unit
AFS	Air Force Station
AFSS	Automated Flight Service Station
A/G	Air-to-Ground
AGL	Above Ground Level
AGNIS	Azimuth Guidance Nose-in-Stand
AH	Alert Height
AHP	Army Heliport
AIRAC	Aeronautical Information Regulation and Control
AIREP	Air-Report
AIS	Aeronautical Information Services
ALA	Aircraft Landing Area
ALF	Auxiliary Landing Field
ALS	Approach Light System
ALS	Low Intensity Approach Lights
ALT	Altitude
ALTN	Alternate
AMA	Area Minimum Altitude
AMSL	Above Mean Sea Level
ANGB	Air National Guard Base
AOC	Aircraft Operator Certificate
AOE	Airport/Aerodrome of Entry
AOM	Airport Operating Minimums
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
AR	Authorization Required
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
ASDE-X	Airport Surface Detection Equipment - Model X
ASMGCS	Advanced Surface Movement Guidance and Control System
ASOS	Automated Surface Observing System
ASR	Airport Surveillance Radar
ASSC	Airport Surface Surveillance Capability
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
ATND SKD	Attended Scheduled Hours

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ABBREVIATIONS USED IN AIRWAY MANUAL

ATS	Air Traffic Service
ATZ	Aerodrome Traffic Zone
AU	Approach UNICOM
AUP	Airspace Utilization Plane
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
BCM	Back Course Marker
BCN	Beacon
BCOB	Broken Clouds or Better
BCST	Broadcast
BDRY	Boundary
BLDG	Building
BM	Back Marker
BRG	Bearing
B-RNAV	Basic RNAV
BS	Broadcast Station (Commercial)
C	ATC IFR Flight Plan Clearance Delivery Frequency
C	Converted Met Visibility
CADIZ	Canadian Air Defense Identification Zone
CAE	Control Area Extension
CA/GRS	Certified Air/Ground Radio Service
CANPA	Constant Angle Non-Precision Approach
CARS	Community Aerodrome Radio Station
CAT	Category
CBA	Cross Border Area
CCN	Chart Change Notices
CDFA	Continuous Descent Final Approach
CDI	Course Deviation Indicator
CDR	Conditional Route
CDT	Central Daylight Time
CEIL	Ceiling
CERAP	Combined Center/Radar Approach Control
CFIT	Controlled Flight Into Terrain
CGAS	Coast Guard Air Station
CGL	Circling Guidance Lights
CH	Channel
CH	Critical Height
CHGD	Changed
CL	Centerline Lights
CMNPS	Canadian Minimum Navigation Performance Specification
CMV	Converted Met Visibility
CNF	Computer Navigation Fix
CO	County
COMLO	Compass Locator
COMMS	Communications
CONT	Continuous
CONTD	Continued
COORDS	Coordinates
COP	Change Over Point
CORR	Corridor
CP	Command Post
CPDLC	Controller Pilot Data Link Communications
Cpt	Clearance (Pre-Taxi Procedure)
CRC	Cyclical Redundancy Check
CRP	Compulsory Reporting Point
CRS	Course
CST	Central Standard Time
CTA	Control Area
CTAF	Common Traffic Advisory Frequency
CTL	Control
CTOT	Calculated Take-off Time
CTR	Control Zone
CVFP	Charted Visual Flight Procedure
CVFR	Controlled VFR
D	Day
DA	Decision Altitude
DA (H)	Decision Altitude (Height)
D-ATIS	Digital ATIS
DCL	Data Link Departure Clearance Service
DCT	Direct
DECMSND	Decommissioned
DEG	Degree
DEP	Departure Control/Departure Procedures
DER	Departure End of Runway
DEWIZ	Distance Early Warning Identification Zone
DF	Direction Finder
DISPL THRESH	Displaced Threshold
DIST	Distance
D_L	Category D (Large Aircraft)
DME	Distance-Measuring Equipment
DOD	Department of Defense

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ABBREVIATIONS USED IN AIRWAY MANUAL

DOM	Domestic
DP	Obstacle Departure Procedure
DRCO	Dial-up Remote Communications Outlet
E	East or Eastern
EAT	Expected Approach Time
ECOMS	Jeppesen Explanation of Common Minimum Specifications
EDT	Eastern Daylight Time
EET	Estimated Elapsed Time
EFAS	Enroute Flight Advisory Service
EFF	Effective
EFVS	Enhanced Flight Vision System
EGNOS	European Geostationary Navigation Overlay Services
EH	Eastern Hemisphere
ELEV	Elevation
EMAS	Engineered Materials Arresting System
EMERG	Emergency
ENG	Engine
EOBT	Estimated Off Block Time
EST	Eastern Standard Time
EST	Estimated
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
ETE	Estimated Time Enroute
ETOPS	Extended Range Operation with two-engine airplanes
EVS	Enhanced Vision System
FAA	Federal Aviation Administration
FACF	Final Approach Course Fix
FAF	Final Approach Fix
FAIL	Failure
FANS	Future Air Navigation System
FAP	Final Approach Point
FAR	Federal Aviation Regulation
FAS DB	Final Approach Segment Datablock
FAT	Final Approach Track
FATO	Final Approach and Take-off Area
FBL	Light (to qualify icing, turbulence, etc.)
FBO	Fixed Based Operator
FCP	Final Control Point
FIA	Flight Information Area
FIC	Flight Information Center
FIR	Flight Information Region
FIS	Flight Information Service
FL	Flight Level (Altitude)
FLARES	Flare Pots or Goosenecks
FLD	Field
FLG	Flashing
FLT	Flight
FM	Fan Marker
FMC	Flight Management Computer
FMS	Flight Management System
FOD	Foreign Object Damage
FOM	Flight Operation Manual
FPM	Feet Per Minute
FPR	Flight Planning Requirements
FRA	Free Route Airspace
FREQ	Frequency
FSS	Flight Service Station
FT	Feet
FTS	Flexible Track System
G	Guards only (radio frequencies)
GA	General Aviation
GBAS	Ground-Based Augmentation System
GCA	Ground Controlled Approach (radar)
GCO	Ground Communication Outlet
GEN	General
GLONASS	Global Orbiting Navigation Satellite System
GLS	Ground Based Augmentation System [GBAS] Landing System
GMT	Greenwich Mean Time
GND	Ground Control
GND	Surface of the Earth (either land or water)
GNSS	Global Navigation Satellite System
GP	Glidepath
GPA	Glidepath Angle
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
GS	Glide Slope
G/S	Ground Speed
GWT	Gross Weight
H	Non-Directional Radio Beacon or High Altitude
H24	24 Hour Service
HAA	Height Above Airport
HALS	High Approach Landing System
HAS	Height Above Site
HAT	Height Above Touchdown
HC	Critical Height
HDG	Heading
HF	High Frequency (3-30 MHz)
HGS	Head-up Guidance System
HI	High (altitude)
HI	High Intensity (lights)
HIALS	High Intensity Approach Light System
HIRL	High Intensity Runway Edge Lights
HIRO	High Intensity Runway Operations

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ABBREVIATIONS USED IN AIRWAY MANUAL

HIWAS	Hazardous Inflight Weather Advisory Service
HJ	Sunrise to Sunset
HN	Sunset to Sunrise
HO	By Operational Requirements
hPa	Hectopascal (one hectopascal = one millibar)
HPMA	High Performance Military Aircraft
HR	Hours (period of time)
HS	During Hours of Scheduled Operations
HST	High Speed Taxiway Turn-off
HSTIL	High Speed Taxiway Turn-off Indicator Lights
HUD	Head-Up Display
HUDLS	Head-Up Display Landing System
HX	No Specific Working Hours
Hz	Hertz (cycles per second)
I	Island
IAC	Instrument Approach Chart
IAF	Initial Approach Fix
IAML	Integrity Monitor Alarm
IAP	Instrument Approach Procedure
IAS	Indicated Airspeed
IATA	International Air Transport Association
IAWP	Initial Approach Waypoint
IBN	Identification Beacon
ICAO	International Civil Aviation Organization
IDENT	Identification
IF	Intermediate Fix
IFBP	Inflight Broadcast Procedure
IFR	Instrument Flight Rules
IGS	Instrument Guidance System
ILS	Instrument Landing System
IM	Inner Marker
IMAL	Integrity Monitor Alarm
IMC	Instrument Meteorological Conditions
IMTA	Intensive Military Training Area
INDEFLY	Indefinitely
IN or INS	Inches
INFO	Information
INOP	Inoperative
INS	Inertial Navigation System
INT	Intersection
INTL	International
IORRA	Indian Ocean Random RNAV Area
IR	Instrument Restricted Controlled Airspace
IS	Islands
ITWS	Integrated Terminal Weather System
I/V	Instrument/Visual Controlled Airspace
JAA	Joint Aviation Authorities
JAR-OPS	Joint Aviation Requirements–Operations
KGS	Kilograms
kHz	Kilohertz
KIAS	Knots Indicated Airspeed
KM	Kilometers
Kmh	Kilometer(s) per Hour
KT	Knots
KTAS	Knots True Airspeed
L	Locator (Compass)
LAA	Local Airport Advisory
LAAS	Local Area Augmentation System
LACFT	Large Aircraft
LAHSO	Land and Hold Short Operations
LAT	Latitude
LBCM	Locator Back Course Marker
LBM	Locator Back Marker
LBS	Pounds (Weight)
LCG	Load Classification Group
LCN	Load Classification Number
Lctr	Locator (Compass)
LDA	Landing Distance Available
LDA	Localizer-type Directional Aid
LDI	Landing Direction Indicator
LDIN	Lead-in Light System
LED	Light Emitting Diode
LGTH	Length
LIM	Locator Inner Marker
LIRL	Low Intensity Runway Lights
LLWAS	Low Level Wind Shear Alert System
LMM	Locator Middle Marker
LNAV	Lateral Navigation
LNDG	Landing
LO	Locator at Outer Marker Site
LOC	Localizer
LOM	Locator Outer Marker
LONG	Longitude
LP	Localizer Performance
LPV	Localizer Performance with Vertical Guidance
LSALT	Lowest Safe Altitude
LT	Local Time
LTP	Landing Threshold Point
LTS	Lights
LTS	Lower Than Standard
LVP	Low Visibility Procedures
LWIS	Limited Weather Information System
M	Meters

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ABBREVIATIONS USED IN AIRWAY MANUAL

MAA	Maximum Authorized Altitude
MACG	Missed Approach Climb Gradient
MAG	Magnetic
MAHF	Missed Approach Holding Fix
MALS	Medium Intensity Approach Light System
MALSF	Medium Intensity Approach Light System with Sequenced Flashing Lights
MALSR	Medium Intensity Approach Light System with Runway Alignment Indicator Lights
MAP	Missed Approach Point
MAX	Maximum
MB	Millibars
MCA	Minimum Crossing Altitude
16 MCAF	Marine Corps Air Facility
MCAS	Marine Corps Air Station
MCTA	Military Controlled Airspace
MDA	Minimum Descent Altitude
MDA(H)	Minimum Descent Altitude (Height)
MDT	Mountain Daylight Time
MEA	Minimum Enroute Altitude
MEHT	Minimum Eye Height Over Threshold
MEML	Memorial
MET	Meteorological
MF	Mandatory Frequency
MFA	Minimum Flight Altitude
MHA	Minimum Holding Altitude
MHz	Megahertz
MI	Medium Intensity (lights)
MIALS	Medium Intensity Approach Light System
MIL	Military
MIM	Minimum
MIN	Minute
MIPS	Military Instrument Procedure Standardization
MIRL	Medium Intensity Runway Edge Lights
MKR	Marker Radio Beacon
MLS	Microwave Landing System
MM	Millimeter
MM	Middle Marker
MNM	Minimum
MNPS	Minimum Navigation Performance Specifications
MOA	Military Operation Area
MOC	Minimum Obstacle/Obstruction Clearance
MOCA	Minimum Obstruction Clearance Altitude
MON	Minimum Operational Network
MORA	Minimum Off-Route Altitude (Grid or Route)
MRA	Minimum Reception Altitude
MROT	Minimum Runway Occupancy Time
MSA	Minimum Safe/Sector Altitude
MSL	Mean Sea Level
MST	Mountain Standard Time
MTA	Military Training Area
MTAF	Mandatory Traffic Advisory Frequency
MTCA	Minimum Terrain Clearance Altitude
MTMA	Military Terminal Control Area
MTOM	Maximum Take-off Mass
MTOW	Maximum Take-off Weight
MUN	Municipal
MVA	Minimum Vectoring Altitude
N	Night, North or Northern
NA	Not Authorized
NAAS	Naval Auxiliary Air Station
NADC	Naval Air Development Center
NAEC	Naval Air Engineering Center
NAF	Naval Air Facility
NALF	Naval Auxiliary Landing Field
NAP	Noise Abatement Procedure
NAR	North American Routes
NAS	Naval Air Station
NAT	North Atlantic Traffic
NAT/OTS	North Atlantic Traffic/Organized Track System
NATIONAL XXX	National Specific Criteria
NATL	National
NAVAID	Navigational Aid
NCA	Northern Control Area
NCN	NavData Change Notices
NCRP	Non-Compulsory Reporting Point
NDB	Non-Directional Beacon/Radio Beacon
NE	Northeast
NM	Nautical Mile(s)
No	Number
NoPT	No Procedure Turn
NOTAM	Notices to Airmen
NOTSP	Not Specified
NPA	Non-Precision Approach
NW	Northwest
NWC	Naval Weapons Center
OAC	Oceanic Area Control
OAS	Obstacle Assessment Surface
OCA	Oceanic Control Area
OCA (H)	Obstacle Clearance Altitude (Height)

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ABBREVIATIONS USED IN AIRWAY MANUAL

OCL	Obstacle Clearance Limit
OCNL	Occasional
OCTA	Oceanic Control Area
ODALS	Omni-Directional Approach Light System
ODP	Obstacle Departure Procedure
OFZ	Obstacle Free Zone
OM	Outer Marker
OPS	Operations or Operates
O/R	On Request
O/T	Other Times
OTR	Oceanic Transition Route
OTS	Other Than Standard
OTS	Out-of-Service
PA	Precision Approach
PAL	Pilot Activated Lighting
PANS-OPS	Procedures for Air Navigation Services - Aircraft Operations
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
PARK	Parking
PBN	Performance Based Navigation
PCL	Pilot Controlled Lighting
PCN	Pavement Classification Number
PCZ	Positive Control Zone
PDC	Pre-Departure Clearance
PDG	Procedure Design Gradient
PDT	Pacific Daylight Time
PERF	Performance
PERM	Permanent
PinS	Point In Space
PISTON	Piston Aircraft
PJE	Parachute Jumping Exercise
PLASI	Pulsating Visual Approach Slope Indicator
PNR	Prior Notice Required
POFZ	Precision Obstacle Free Zone
PPO	Prior Permission Only
PPR	Prior Permission Required
PRA	Precision Radar Approach
PRM	Precision Radar Monitor
P-RNAV	Precision RNAV
PROC	Procedure
PROP	Propeller Aircraft
PSP	Pierced Steel Planking
PST	Pacific Standard Time
PTO	Part Time Operation
PVT	Private Operator
QDM	Magnetic bearing to facility
QDR	Magnetic bearing from facility
QFE	Height above airport elevation (or runway threshold elevation) based on local station pressure
QNE	Altimeter setting 29.92" Hg or 1013.2 Mb.
QNH	Altitude above sea level based on local station pressure
R	R-063 or 063R Magnetic Course (radial) measured as 063 from a VOR station. Flight can be inbound or outbound on this line.
R	Radar capability (R) for Approach, Departure and Center in Communications band.
R	Runway Visual Range
RA	Radio Altimeter
RAI	Runway Alignment Indicator
RAIL	Runway Alignment Indicator Lights
RAIM	Receiver Autonomous Integrity Monitoring
RAPCON	Radar Approach Control
RASS	Remote Altimeter Source
RCAG	Remote Communications Air Ground
RCC	Rescue Coordination Center
RCL	Runway Centerline
RCLM	Runway Center Line Markings
RCO	Remote Communications Outlet
REF	Reference
REIL	Runway End Identifier Lights
RENL	Runway End Lights
REP	Reporting Point
RESA	Runway End Safety Area
REV	Reverse
REP	Ramp Entrance Point
RF	Radius to Fix
RFL	Requested Flight Level
RL	Runway (edge) Lights
RLLS	Runway Lead-in Light System
RMZ	Radio Mandatory Zone
RNAV	Area Navigation
RNP	Required Navigation Performance
RNP AR	Required Navigation Performance Authorization Required
RNPC	Required Navigation Performance Capability
ROC	Rate of Climb
RON	Remain Overnight
RPT	Regular Public Transport
RSA	Runway Safety Area
RTE	Route
RTF	Radiotelephony
RTS	Return to Service
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
RVV	Runway Visibility Values

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ABBREVIATIONS USED IN AIRWAY MANUAL

RW	Runway
RWSL	Runway Status Lights
RWY	Runway
S	South or Southern
SAAAR	Special Aircraft and Aircrew Authorization Required
SALS	Short Approach Light System
SALSF	Short Approach Light System with Sequenced Flashing Lights
SAP	Stabilized Approach
SAR	Search and Rescue
SATCOM	Satellite voice air-ground calling
SAWRS	Supplementary Aviation Weather Reporting Station
SBAS	Satellite-Based Augmentation System
17 SCA	Southern Control Area
SCOB	Scattered Clouds or Better
SDF	Simplified Directional Facility
SDF	Step-Down Fix
SE	Southeast
SEC	Seconds
SELCAL	Selective Call System
SFC	Surface of the earth (either land or water)
SFL	Sequenced Flashing Lights
SFL-V	Sequenced Flashing Lights - Variable Light Intensity
SID	Standard Instrument Departure
SIWL	Single Isolated Wheel Load
SKD	Scheduled
SLD	Sealed Runway
SLP	Speed Limiting Point
SM	Statute Miles
SMA	Segment Minimum Altitude
SMGCS	Surface Movement Guidance and Control System
SMSA	Segment Minimum Safe Altitude
SOC	Start of Climb
SODALS	Simplified Omnidirectional Approach Lighting System
SPAR	French Light Precision Approach Radar
SRA	Special Rules Area
SRA	Surveillance Radar Approach
SRE	Surveillance Radar Element
SR-SS	Sunrise-Sunset
SSALF	Simplified Short Approach Light System with Sequenced Flashing Lights
SSALR	Simplified Short Approach Light System with Runway Alignment Indicator Lights
SSALS	Simplified Short Approach Light System
SSB	Single Sideband
SSR	Secondary Surveillance Radar (in U.S.A. ATCRBS)
STAP	Parameter Automatic Transmission System
STAR	Standard Terminal Arrival Route (USA)
	Standard Instrument Arrival (ICAO)
STD	Indication of an altimeter set to 29.92" Hg or 1013.2 hPa (Mb) without temperature correction
Std	Standard
ST-IN	Straight-in
STOL	Short Take-off and Landing
SUPP	Supplemental/Supplementary
SW	Single Wheel Landing Gear
SW	Southwest
SYS	System
°T	True (degrees)
T	Terrain clearance altitude (MOCA)
T	Transmits only (radio frequencies)
T-VASI	Tee Visual Approach Slope Indicator
TA	Transition Altitude
TAA	Terminal Arrival Area (FAA)
TAA	Terminal Arrival Altitude (ICAO)
TACAN	Tactical Air Navigation (bearing and distance station)
TAR	Terminal Area Surveillance Radar
TAS	True Air Speed
TCA	Terminal Control Area
TCAS	Traffic Alert and Collision Avoidance System
TCH	Threshold Crossing Height
TCTA	Transcontinental Control Area
TDWR	Terminal Doppler Weather Radar
TDZ	Touchdown Zone
TDZE	Touchdown Zone Elevation
TEMP	Temporary
TERPS	United States Standard for Terminal Instrument Procedure
THR	Threshold
TIBA	Traffic Information Broadcast by Aircraft
TIZ	Traffic Information Zone
TL	Transition Level
TMA	Terminal Control Area
TML	Terminal
TMN	Terminates
TMZ	Transponder Mandatory Zone
TNA	Transition Area
TODA	Take-off Distance Available
TORA	Take-off Run Available

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ABBREVIATIONS USED IN AIRWAY MANUAL

TP	Turning Point
TRA	Temporary Reserved Airspace
TRACON	Terminal Radar Approach Control
TRANS	Transition(s)
TRANS ALT	Transition Altitude
TRANS LEVEL	Transition Level
TRCV	Tri-Color Visual Approach Slope Indicator
TSA	Temporary Segregated Area
TVOR	Terminal VOR
TWEB	Transcribed Weather Broadcast
TWIP	Terminal Weather Information for Pilots
TWR	Tower (Aerodrome Control)
TWY	Taxiway
U	Unknown/Unrestricted/Unspecified
U	UNICOM
UAS	Unmanned Aerial System
UAV	Unmanned Aerial Vehicle
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
UPR	User Preferred Route
U/S	Unserviceable
USAF	US Air Force
USB	Upper Sideband
USN	US Navy
UTA	Upper Control Area
UTC	Coordinated Universal Time
V	Visibility
VAL	Vertical Alert Limit
VAR	Magnetic Variation
VASI	Visual Approach Slope Indicator
VDA	Vertical Descent Angle
VDP	Visual Descent Point
VE	Visual Exempted
VFR	Visual Flight Rules
VGF	Visual Guidance Fix
VGSI	Visual Glide Slope Indicator
VHA	Volcanic Hazard Area
VHF	Very High Frequency (30-300 MHz)
VIS	Visibility
VMC	Visual Meteorological Conditions
VNAP	Vertical Noise Abatement Procedures
VNAV	Vertical Navigation
VOLMET	Meteorological Information for Aircraft in Flight
VOR	VHF Omnidirectional Range
VORTAC	VOR and TACAN co-located
VOT	Radiated Test Signal VOR
VPA	Vertical Path Angle
VPT	Visual Maneuvering with Prescribed Tracks
VSS	Visual Segment Surface
VV	Vertical Visibility
V/V	Vertical Velocity or speed
W	West or Western
WAAS	Wide Area Augmentation System
WATIR	Weather and Terminal Information Reciter
WH	Western Hemisphere
W/O	Without
WP	Area Navigation (RNAV) Waypoint
WSP	Weather Systems Processor
WX	Weather
X	Communication Frequency On Request
Z	Zulu Time/Coordinated Universal Time (UTC)

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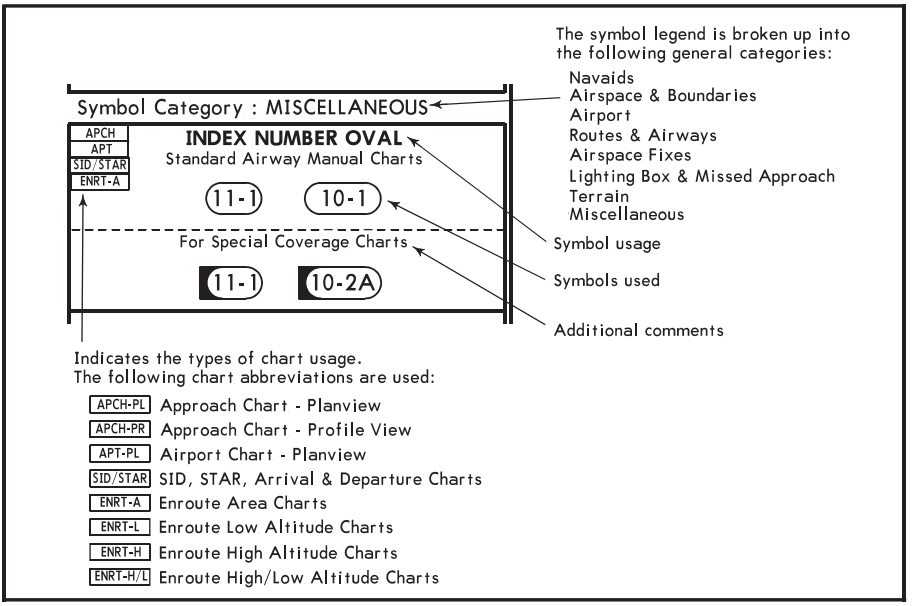
CHARTING SYMBOLS LEGEND

SYMBOLS



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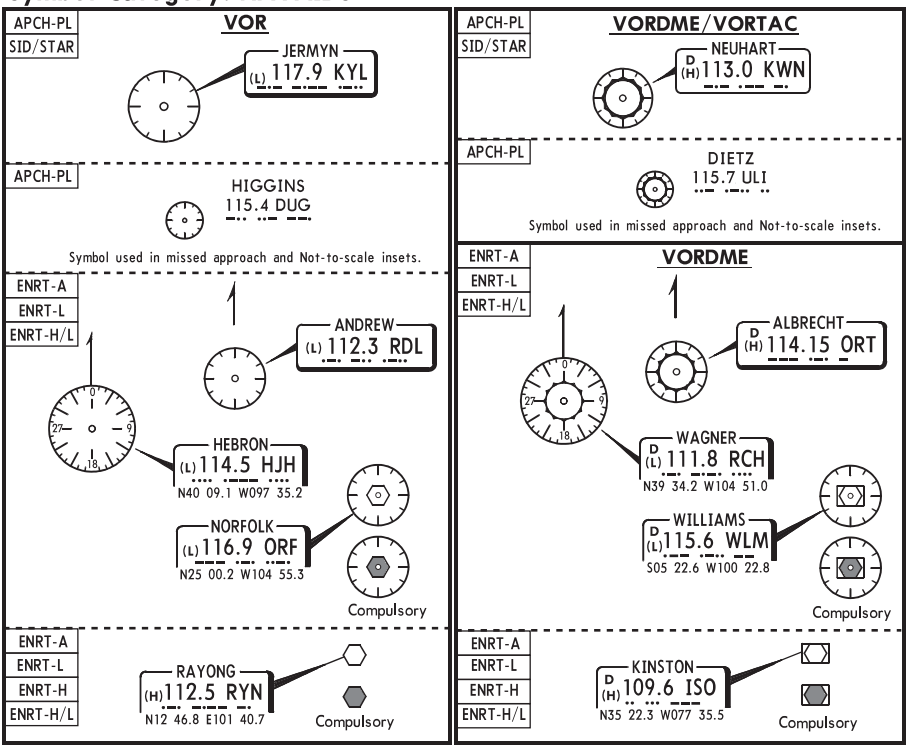
Symbol Category: NAVAIDS



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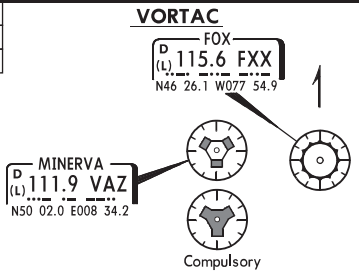
CHARTING SYMBOLS LEGEND

Symbol Category: NAVAIDS

ENRT-A
ENRT-L
ENRT-H/L

VORTAC



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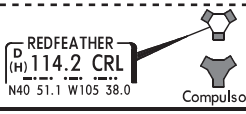
ENRT-H/L



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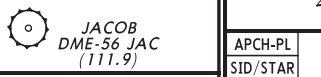
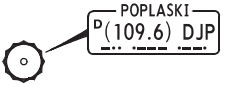
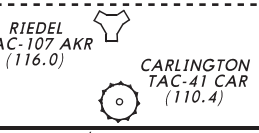


APCH-PL
SID/STAR

TACAN



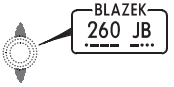
ENRT-A
ENRT-L
ENRT-H
ENRT-H/L



APCH-PL
SID/STAR

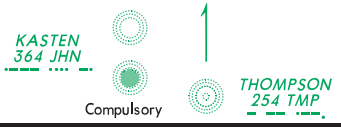
NDB/LOCATOR

APCH-PL
SID/STAR
ENRT-A
ENRT-L
ENRT-H/L



Locator co-located with a Marker (LOM)

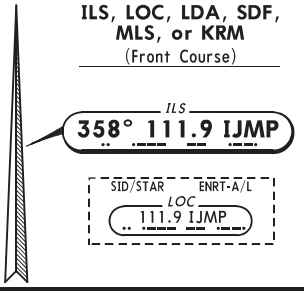
ENRT-A
ENRT-L
ENRT-H
ENRT-H/L



APCH-PL
SID/STAR
ENRT-A
ENRT-L

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

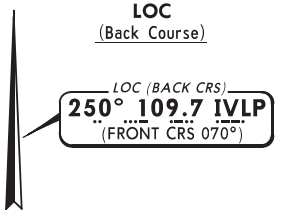
(Front Course)



APCH-PL
SID/STAR

LOC

(Back Course)



ENRT-A
ENRT-L
ENRT-H/L

APCH-PL

Offset Localizer

APCH-PL
SID/STAR

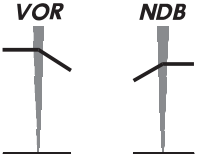
Markers

When co-located, the marker symbol is cleared from the associated waypoint or navaid.

APCH-PR

APCH-PR

VOR/VORDME/VORTAC/NDB



APCH-PR

ILS Glide Slope

APCH-PR

RNAV Glide Path

APCH-PR

GLS Glide Path

APT-PL

NAVAIDS

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CHARTING SYMBOLS LEGEND

Symbol Category: AIRSPACE & BOUNDARIES

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Special Use Airspace

Advisory Area (Canada), Alert Area, Caution Area, JDA Areas (Japan), Military Operations Area, Temporary Reserved Airspace, Training Area, Warning Area

APCH-PL
APT-PL
SID/STAR

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Special Use Airspace

Areas of Intense Air Activity, Danger Area, Flight Restricted Zones(FAA), Fuel Dumping Areas, High Intensity Radio Transmission Areas, Prohibited Area, Restricted Area

APCH-PL
APT-PL
SID/STAR

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Special Flight Rules Area (FAA)

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Class A Airspace

Control Area Extensions(Canada),Control Areas, Military Terminal Control Areas, Transition Areas(Canada), Terminal Control Areas, Upper Control Areas

A A

ENRT-A
ENRT-L
ENRT-H/L

Class B Airspace

Class B (FAA),Control Area Extensions(Canada), Control Areas,Military Terminal Control Areas, Transition Areas (Canada), Terminal Control Areas, Upper Control Areas

B B

ENRT-A
ENRT-L
ENRT-H/L

Class C Airspace

Class C (FAA),Control Area Extensions(Canada), Control Areas,Military Terminal Control Areas, Transition Areas (Canada), Terminal Control Areas, Upper Control Areas

C C

ENRT-A
ENRT-L
ENRT-H/L

Class D Airspace

Control Area Extensions(Canada),Control Areas, Military Terminal Control Areas, Transition Areas(Canada), Terminal Control Areas, Upper Control Areas

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Class G Airspace

ENRT-H

Control Area, Military Terminal Control Area, Terminal Control Area

ENRT-A
ENRT-L
ENRT-H/L

Air Traffic Services

Class D (FAA), Class E (FAA), Control Zone, Military Control Zone, Tower Control Area

ENRT-A
ENRT-L
ENRT-H/L

Air Traffic Services

Air Traffic Zone, Helicopter Protected Zone, Helicopter Traffic Zone, Military Air Traffic Zone, Positive Control Area, Special Rules Area/Zone, Traffic Information Area/Zone

ENRT-A
ENRT-L
ENRT-H

Oceanic Control Area, FAA Control Areas

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Air Defense Identification Zone

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L
SID/STAR

Flight Information Region / Upper Flight Information Region

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Air Route Traffic Control Center, Area Control Center,Area of Responsibility, Delegated Airspace, Upper Area Control Center

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

CNS/ATM Equipment Boundary (MNPS, RNP, RVSM)

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Random RNAV Area

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CHARTING SYMBOLS LEGEND

Symbol Category: AIRSPACE & BOUNDARIES

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Enroute Communications Sector

Low or High Altitude Sectors

ENRT-H

High Altitude Sectors (if vertically sectorized)

APT-PL

SID/STAR

Lost Comms

LOST COMMS LOST COMMS LOST COMMS

ENRT-A, ENRT-L, ENRT-H/L

Frequency Boundary - Class E FIA (Australia)

ENRT-A, ENRT-L, ENRT-H/L

Frequency Boundary - Class G FIA (Australia)

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Frequency Boundary - HF

ENRT-A, ENRT-H, ENRT-H/L

Free Route Airspace

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

International Boundary

APCH-PL, APT-PL, SID/STAR

ENRT-A, ENRT-L, ENRT-H/L

Mandatory Broadcast Zone

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L, SID/STAR

QNE/QNH Boundary

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

RVSM Transition Boundary

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Special VFR Not Authorized

ENRT-A, ENRT-L, ENRT-H/L

Speed Restriction Boundary

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Time Zone

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

State/Province Boundary

ENRT-H

Common Traffic Advisory Frequency Boundary (Australia)

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Advisory Radio Area, Radar Area/Zone

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Symbol Category: AIRPORT

APT-PL

Runway Number

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

27

APT-PL

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

27 267°

APT-PL

Seaplane operating area, or water runway

27W

APT-PL

Seaplane Operating Area

APT-PL

Paved Runway

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CHARTING SYMBOLS LEGEND

Symbol Category: AIRPORT

APT-PL **Unpaved Runway**

APT-PL **Displaced Threshold**

APT-PL **Hold Lines**

Hold Line

With Guard Lights

CAT II/III

With Stop Bars

Intermediate

APT-PL **Approach lights extending to displaced threshold**

APT-PL **Arrester Gear**

Unidirectional

APT-PL Bidirectional

APT-PL **Jet Barrier**

APT-PL **Closed Runway**

APT-PL **Stopway, Overrun, Blast Pad or Multiple use**

1005' Stopway

APT-PL **Area Under Construction**

APT-PL **Runway Shoulder (when readily noticeable)**

APT-PL **Standard ALSF-I**

APT-PL **Standard ALSF-II**

APT-PL **MALSR/SSALR**

APT-PL **MALS/MALSF**

APT-PL **SALS**

APT-PL **SSALF/SSALS**

APT-PL **ODALS**

APT-PL **HIALS (Calvert)**

APT-PL **HIALS (Calvert II)**

APT-PL **HIALS**

APT-PL **LDIN/RLLS**

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CHARTING SYMBOLS LEGEND

Symbol Category: AIRPORT

APT-PL

RAIL

APT-PL

Road

APT-PL

Trees

APT-PL

Bluff

APT-PL

Pole Line

APT-PL

Railroad

APT-PL

Ditch

APT-PL

Buildings

APT-PL

Lighted Pole

APT-PL

Unidentified Beacon

APT-PL

Permanently Closed Taxiway

APT-PL

Taxiway and Apron

APT-PL

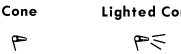
LAHSO Distance Points

APT-PL

RVR Measuring Site

APT-PL

Wind Indicator



APT-PL

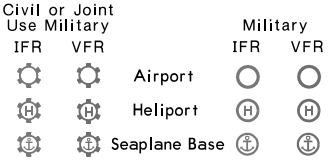
Tee

APT-PL

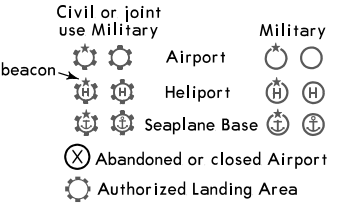
Tetrahedron

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Airports



APCH-PL
APT-PL
SID/STAR



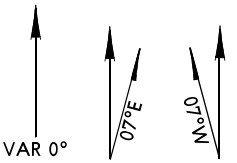
APCH-PL
ENRT-A

APT-PL

Helicopter Landing Pad

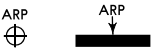
APT-PL

Magnetic Variation



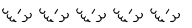
APT-PL

Airport Reference Point (ARP)



APT-PL

Tree Line



APT-PL

Building Area

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CHARTING SYMBOLS LEGEND

Symbol Category: ROUTES & AIRWAYS

APCH-PL, APCH-PR, SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Track/Airway

ENRT-L
Overlying High Altitude Airway

ENRT-L
Diversionary Route

APCH-PR
Non-precision when charted with precision approach

ENRT-A
Arrival/Departure Route

SID/STAR
Transition Track

APCH-PL
High Level Approach Track

APCH-PL, APCH-PR
Visual Track

APCH-PR
VNAV/VDA
Vertical descent angle and/or path

APCH-PR
Vertical descent angle and/or path to DA for approved operators

SID/STAR
Radar Vectors

APCH-PL
Missed Approach Course

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Navigational Signal Gap

SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Altitude Change "T"
MEA, MAA, MOCA, or MORA change.
Does not apply to GPS MEA's or at Navaids

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Total Milage
Total Mileage between Navaids
23

SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Change Over Point
Mileages indicate point to change Navaids
22
65

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Even and Odd Indicators
Even and Odd altitudes are used in direction indicated
<E E>
<O O>
<E&O E&O>
E&O

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Prior Permission Required
Prior Permission Required from ATC for flight in direction of arrow.
◄PPR

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Flight Planned Route
FPR►

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Airway By-Pass

APCH-PL, SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Airway Designator
Negative
V 102

APCH-PL
Positive
U 571

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
Route Suffix
Suffixes are added to indicate more restrictive segment along airway. Each suffix has a unique meaning.
J 225 R

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L
One Way Airway
V 76

21

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CHARTING SYMBOLS LEGEND

Symbol Category: ROUTES & AIRWAYS

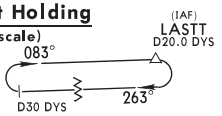
APCH-PL, SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Holding Patterns

APCH-PL

DME Limit Holding

(not to scale)



SID/STAR, ENRT-A, ENRT-L, ENRT-H/L

Intercept Route

SID/STAR, ENRT-A, ENRT-L, ENRT-H/L

DME and DME Radial Formation

APCH-PR

Non Precision Final Approach Fix

APCH-PR

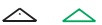
Non Precision Missed Approach Fix

Symbol Category: AIRSPACE FIXES

APCH-PL, SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Non-Compulsory

ENRT-H/L



APCH-PL, SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Compulsory

ENRT-H/L

APCH-PL, SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

RNAV Non-Compulsory/CNF

APCH-PL, SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

RNAV Compulsory

APCH-PL, SID/STAR, ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Mileage Break/CNF

Non-Compulsory Fix

APCH-PL, SID/STAR

Fly Over Fix

Indicated by circle around fix

ENRT-A, ENRT-L, ENRT-H, ENRT-H/L

Meteorological Report Point

Symbol Category: LIGHTING BOX & MISSED APPROACH

APCH-PR

Standard ALSF-I

APCH-PR

Standard ALSF-II

APCH-PR

MALSR

APCH-PR

SSALR

APCH-PR

MALS

APCH-PR

MALSF

APCH-PR

SALS

APCH-PR

SSALF

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CHARTING SYMBOLS LEGEND

Symbol Category: LIGHTING BOX & MISSED APPROACH

APCH-PR

SSALS

APCH-PR

HIALS (Calvert)

APCH-PR

HIALS (Calvert II)

APCH-PR

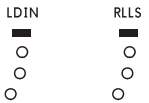
HIALS

APCH-PR

ODALS

APCH-PR

LDIN/RLLS



APCH-PR

RAIL

APCH-PR

Climb

APCH-PR

Left Turn (less than 45°)

APCH-PR

Left Turn (greater than 45°)

APCH-PR

Right Turn (less than 45°)

APCH-PR

Right Turn (greater than 45°)

APCH-PR

Direct

Symbol Category: TERRAIN

APCH-PL
APT-PL
SID/STAR
ENRT-A

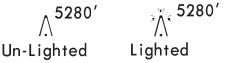
Natural Terrain High Point

APCH-PL
APT-PL
SID/STAR

Man-made High Point

APCH-PL
APT-PL
SID/STAR

Unidentified Man-made Structure



APCH-PL

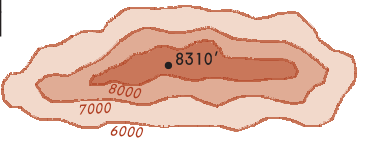
Highest Arrow

APCH-PL
APT-PL
SID/STAR

Hazard Beacon

APCH-PL
APT-PL
SID/STAR
ENRT-A

Generalized Terrain Contours



ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Grid MORA

APCH-PL
APT-PL
ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Water

22

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CHARTING SYMBOLS LEGEND

Symbol Category: MISCELLANEOUS

APCH
APT
SID/STAR
ENRT-A

Index Number Oval

Standard Airway Manual Charts

11-1 10-1

For Special Coverage Charts

11-1 10-2A

APCH-PL
SID/STAR

Holding Pattern Length

1 1½ 2

SID/STAR

Arrival/Departure Airport

APCH-PL

City Pattern

APCH-PL

Airline Chart Icon

APT-PL
ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

North Arrow

N

N

APT-PL

Bar Scale

Feet 0 1000 2000 3000 4000 5000

Meters 0 500 1000 1500

ENRT-L
ENRT-H
ENRT-H/L

Enroute Chart Overlap

4

ENRT-L
ENRT-H
ENRT-H/L

Area Chart Overlap

DENVER
KDEN

ENRT-L
ENRT-H
ENRT-H/L

Inset Boundary

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Remote Communications Outlet (RCO)

2.6-LEESBURG
FALLS CHURCH

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Grid

W090°

ENRT-A
ENRT-L
ENRT-H
ENRT-H/L

Isogonic Line

19°E

END OF SYMBOLS LEGEND

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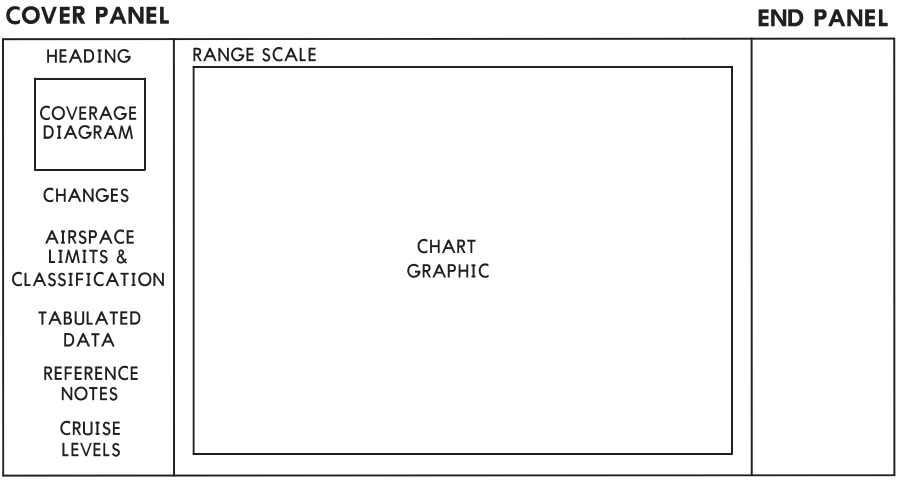
ENROUTE CHART LEGEND

ENROUTE

NOTE: This section of the Jeppesen legend pages provides a general overview regarding the layout and depiction of Enroute Charts.

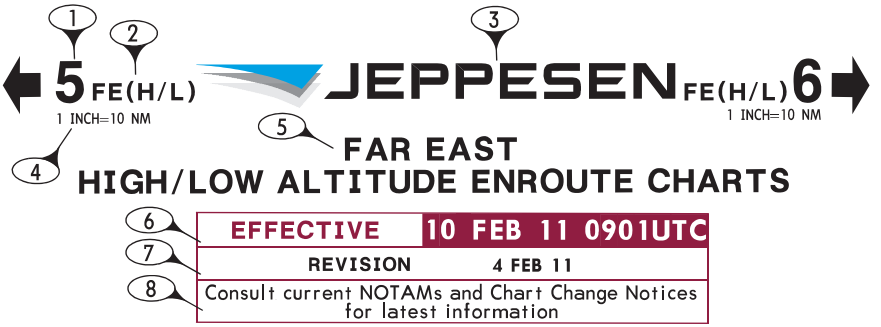
Jeppesen Enroute Charts are compiled and constructed using the best available aeronautical and topographical reference charts. Most Enroute Charts use the Lambert Conformal Conic projection. The design is intended primarily for airway instrument navigation to be referenced to cockpit instruments. The following pages briefly explain the information used on Enroute charts throughout the world. Not all items explained apply to all charts. The Enroute chart is divided into specific areas of information as illustrated below.

ENROUTE CHART FORMAT



23

HEADING



1 — Chart number.
2 — Chart name.
3 — Jeppesen company logo.
4 — Chart scale.
5 — Chart region and type.
6 — Chart effective date.
7 — Chart revision date.
8 — Chart Change Notice cross reference statement.

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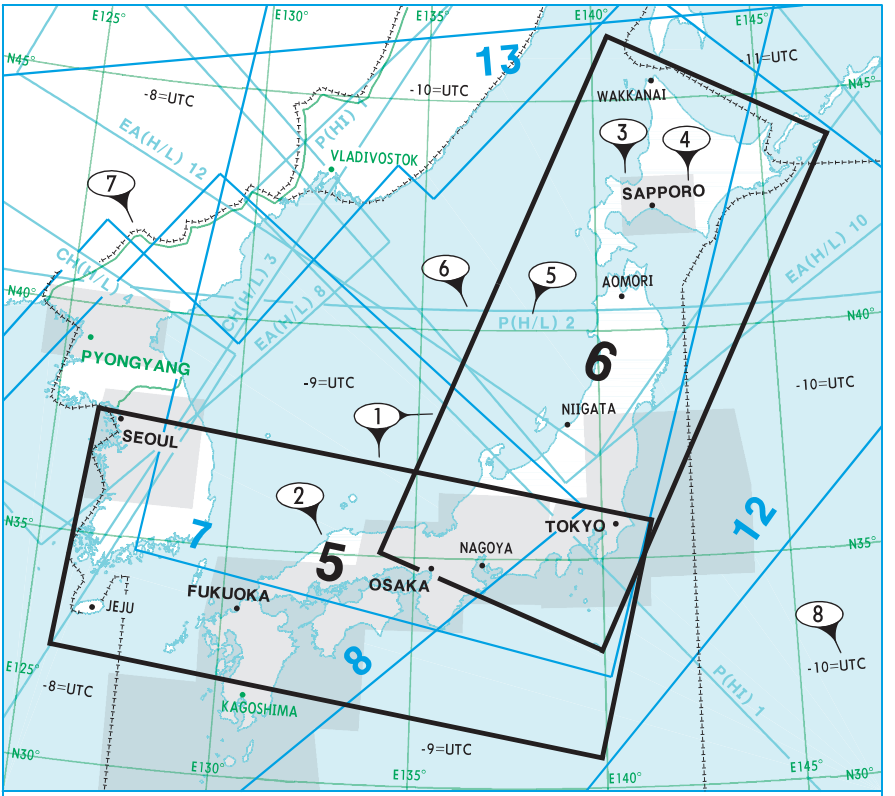
COVERAGE DIAGRAM



AIRWAYS/ROUTES/CONTROLLED AIRSPACE shown on these charts are generally effective at all altitudes. Listed below are FIRs, UIRs, UTAs etc. on these charts that are restricted by altitude limitations. Those FIRs, UIRs, UTAs etc. not listed have altitude control limitations designated as unlimited or no altitudes specified.

1 — Chart coverage neatline.
2 — Chart number.
3 — Area Chart geographic coverage.
4 — Area Chart location name.
5 — Overlapping Enroute Chart name.
6 — Overlapping Enroute Chart geographic coverage.
7 — Time Zone Boundary
8 — Time Zone Designator
9 — Chart intent note.

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CHANGES

1 2 3

CHANGES

FE(H/L)5 Training Areas desig, revoked (N of Pohang, Korea).

FE(H/L)6 Airways desig, realigned (Japan). Tokyo ACC sector limits changed.

1 — Chart name.
2 — Chart number.
3 — Change note providing main changes made since previous revision.

AIRSPACE LIMITS AND CLASSIFICATION

1 2 3

24

LIMITS AND CLASSIFICATIONS OF DESIGNATED AIRSPACE					
	CLASS	LOWER- **RNAV** -UPPER		CLASS	LOWER- **RNAV** -UPPER
INCHEON FIR AIRWAYS	**(E)**	GND - **FL195** - FL245	FUKUOKA FIR	**(A)**	FL290 - UNL
	(A)	FL200 - FL600		**(E)**	GND - FL290
	(D)	8000 - FL200	FUKUOKA OCEANIC CTA	**(A)**	FL200 - UNL
				(E)	GND - FL200

1 — FIR/UIR, Country or Controlled airspace name.
2 — Airspace classification.
3 — Airspace vertical limits.

TABULATED DATA

COMMUNICATIONS

1 2 3

ARACAJU, BRAZIL p6C
Santa Maria. **Aracaju Control (App)** 119.0 120.3

BELEM, BRAZIL p4B
Val De Cans/Julio Cezar Ribeiro Intl. **Belem Control App(R)** 119.05 119.5 **Twr** 118.7 ***Gnd** 121.9

BELO HORIZONTE, BRAZIL SBCF p2D
●Pampulha-Carlos Drummond De Andrade. **Belo Horizonte Control (App) (R)** 119.65 129.1 129.4 **Control (Dep) (R)** 120.2 **Twr** 118.0 **Gnd** 121.6

●Tancredo Neves Intl. **Belo Horizonte Control (App) (R)** 119.65 129.1 129.4 **Control (Dep) (R)** 120.2 **Confins Twr** 118.2 **Gnd** 121.9

BRASILIA, BRAZIL SBBR p2C
Pres Juscelino Kubitschek Intl. **Brasilia Control (App)(R)** 119.2 119.5 119.7 120.0 120.3 **Dep(R)** 119.5 **Twr** 118.1 118.45 **Gnd** 121.8

Curvelo, BRAZIL p2D
Curvelo *Twr 119.1 119.5

4 5 1

1 — Airport Location name. IFR = Upper case. VFR = Upper/Lower case.
2 — Airport name.
3 — Charted location is shown by Area chart and/or panel number-letter combination.
4 — Communication information (includes call name, App, Arr, Dep, Twr, Gnd).
BOLD NAME – Voice Call
T – Transmit only.
G – Guard only.
* – Part time operation.
X – On request.
(R) – Radar capability.
Airport Broadcast Service frequencies (ATIS, ASOS, AWOS, etc.) are positioned over the airport label on face of chart.
Common EMERGENCY 121.5 – not listed
Refer to Glossary and Abbreviations in Introduction pages for further explanations.
5 — Bullet indicates multiple airports under same Location name.

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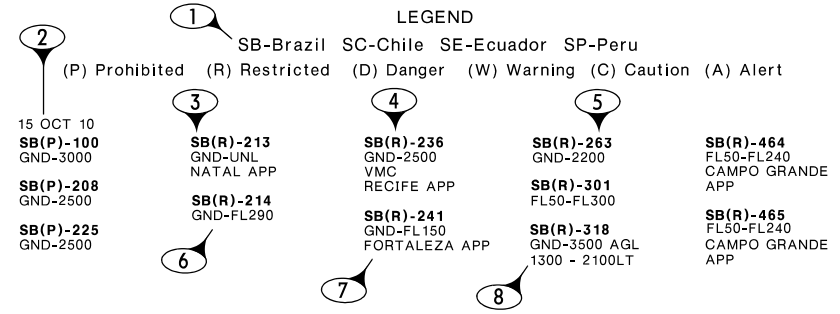
SPECIAL USE AIRSPACE

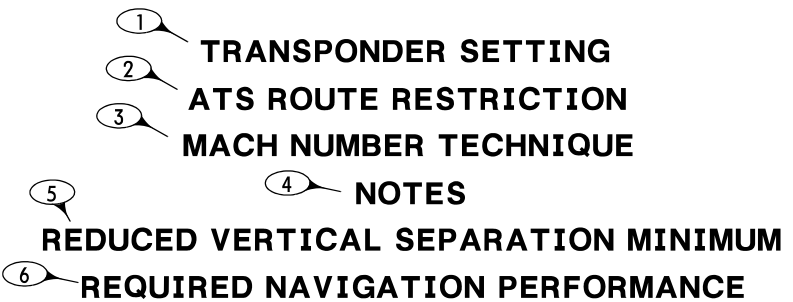
SPECIAL USE AIRSPACE



1 — Legend which includes:
Affected Country ICAO ident
Charted airspace types
2 — Tabulation change date.
3 — Country ICAO ident.
4 — Airspace type.
5 — Airspace ident.
6 — Airspace vertical limits.
7 — Airspace clearance approval agency.
8 — Times of Operation. H24 if not specified.

NOTE: Special use Airspace between GND/MSL and 2000' is not depicted on Enroute and Area charts in several regions.

REFERENCE NOTES



1 — Settings and Procedures for Transponder Operations.
2 — Restrictions associated with ATS routes within a given FIR or UIR.
3 — Procedures for Mach Number reporting within a region or FIR/UIR.
4 — Notes which have operational significance to charted features.
5 — Procedures for RVSM Operations within a region or FIR/UIR.
6 — Procedures and RNP values listed for airways within a region or FIR/UIR.

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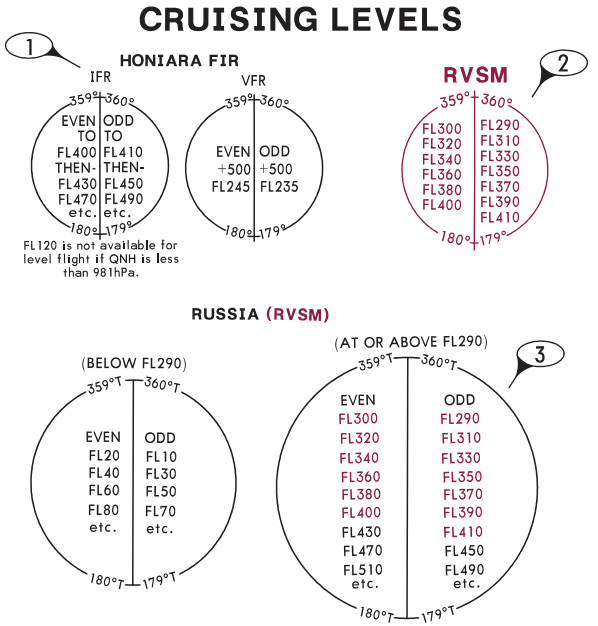
CRUISING LEVELS



1 — Country and/or ICAO specified cruising altitudes/levels.

2 — Standard RVSM Cruise Table associated with charted RVSM airspace. Non standard flight levels are depicted on the chart underneath the airway designator.

3 — Cruise Table which incorporates both Conventional and RVSM cruising altitudes/levels.

RANGE SCALE

1 — Chart scale in Nautical Miles.

2 — Chart Projection.

END PANEL

End Panels on Jeppesen Enroute Charts are primarily used for additional tabulated and reference information which can not all fit on the Cover Panel.

CHART GRAPHIC

The contents of an IFR Enroute chart include information provided by official government source, as well as, on rare occasion Jeppesen derived data. Charts are comprised of aeronautical data, cultural data, hydrography and on some charts terrain data.

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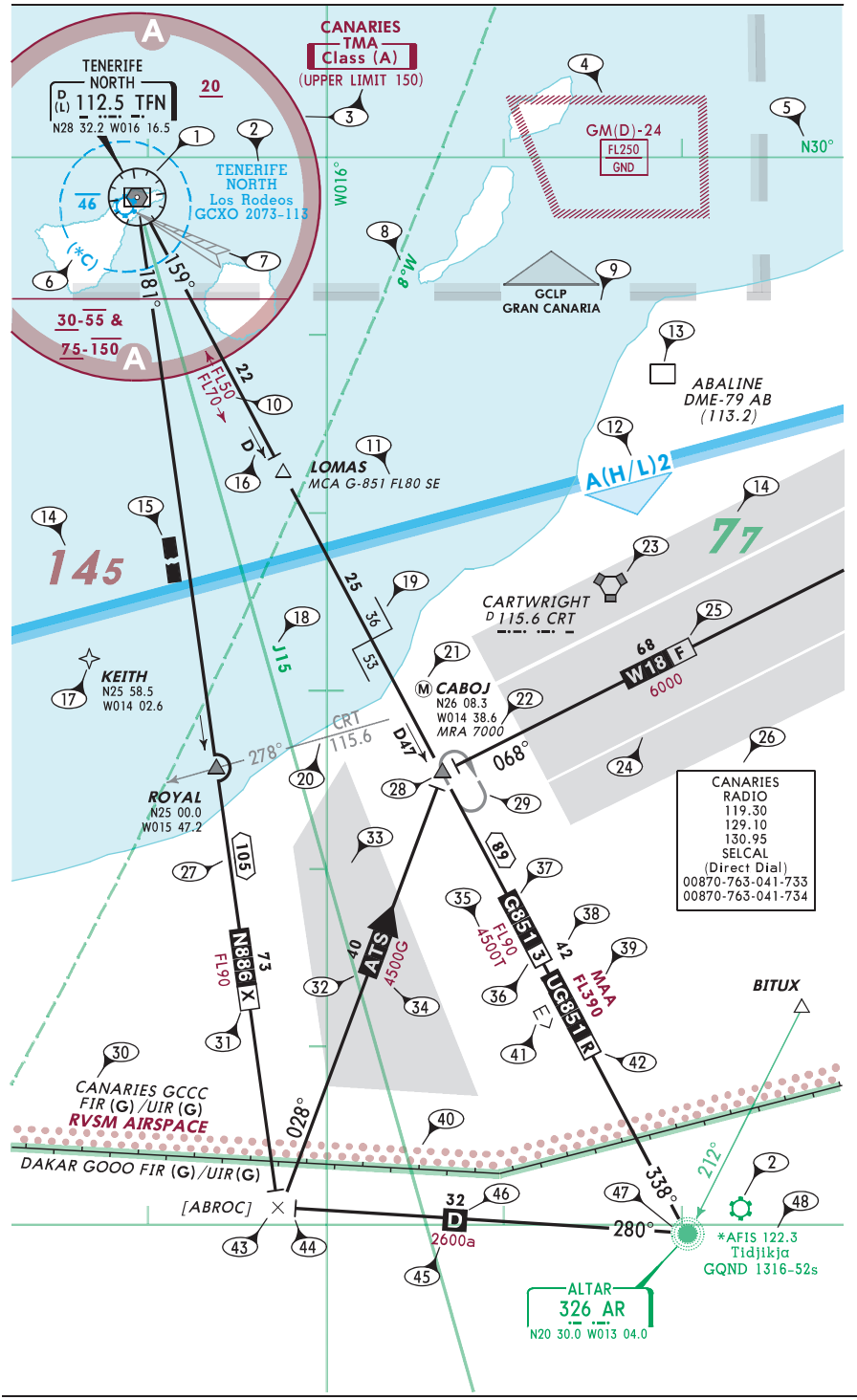

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1 — VORDME. Low and High/Low charts include a Compass Rose with VHF Navaids. Shadow box indicates navaid is airway component, with frequency, identifier, Morse code and INS coordinates. Small "D" indicates DME/TACAN. Class indicated by: (T) Terminal, (L) Low, (H) High.

2 — Airports - Location name, Airport name (if different than Location name), ICAO identifier, airport elevation and longest runway length to nearest 100 feet with 70 feet as the dividing point (add 00). "s" indicates soft surface, otherwise hard surface. IFR Airport in blue - Published procedures filed under the location name. VFR airport in green.

3 — Controlled Airspace. Limits add 00. When sectorized vertically, lower limit indicated by under bar, upper limit indicated by over bar.

4 — Special use airspace.

5 — Grid Lat-Long values.

6 — CTR. Asterisks are used in association with Class C, D and E airspace in the US only to indicate part time operations, otherwise hours are H24.

7 — ILS available at airport.

8 — Magnetic Variation.

9 — Area chart coverage.

26

10 — Directional MEAs.

11 — Minimum Crossing Altitude (MCA).

12 — Change to adjoining Enroute chart.

13 — DME.

14 — Grid MORA. Values 10,000 feet and greater are maroon. Values less than 10,000 feet are green. Values are depicted in hundreds of feet.

15 — Gap in Nav Signal coverage.

16 — "D" indicates DME/TACAN fix. Segment mileage is DME/TACAN distance from navaid. Arrow without a "D" designates a reporting point from facility.

17 — Non Compulsory RNAV Waypoint.

18 — High Altitude Route included on some low charts for orientation only.

19 — Changeover Point between two navaids.

20 — Intersection or fix formation (Bearing, frequency and ident of remote VHF or LF navaid).

21 — Met report required.

22 — Minimum Reception Altitude (MRA).

23 — VORTAC - High Altitude and off-route Navaids do not include a Compass Rose.

24 — Uncontrolled airway or advisory route.

25 — Route Suffix. D or F indicates ATC Advisory services only. F or G indicates Flight Information services only.

26 — Enroute Communications.

27 — Total mileage between Navaids.

28 — Compulsory Reporting Point represented by screened fill. Non Compulsory Reporting point is open, no fill.

29 — Holding pattern.

30 — FIR/UIR Boundary name, identifier and Airspace Class.

31 — Route usability by non B-RNAV equipped aircraft (within Europe only).

32 — Unnamed, official published ATS route with direction indication.

33 — Uncontrolled Airspace (Class F or G).

34 — GPS MEA.

35 — Minimum Obstruction Clearance Altitude (MOCA).

36 — Conditional Route Category (See Enroute Text pages Europe).

37 — Airway Designator.

38 — Segment mileage.

39 — Maximum Authorized Altitude (MAA).

40 — CNS/ATM Equipment Requirement Boundary.

41 — Non Standard Flight Levels (Even Flight Levels in direction indicated).

42 — RNAV ATS route when not identified by designator (used outside Europe).

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43 — Named or unnamed airspace fix or mileage break. Database identifiers are enclosed in square brackets *[ABROC]*. They may be designated by the State (country) as Computer Navigation Fixes (CNFs) or derived by Jeppesen. These identifiers should not be used in filing flight plans nor should they be used when communicating with ATC; however they are also included in computer planning systems. They are shown only to enable the pilot to maintain orientation when using charts in concert with database navigation systems.

44 — Altitude Change.

45 — Route Minimum Off-Route Altitude (Route MORA).

46 — Direct Route (Requires ATC Approval, will not be accepted in Flight Plans).

47 — NDB.

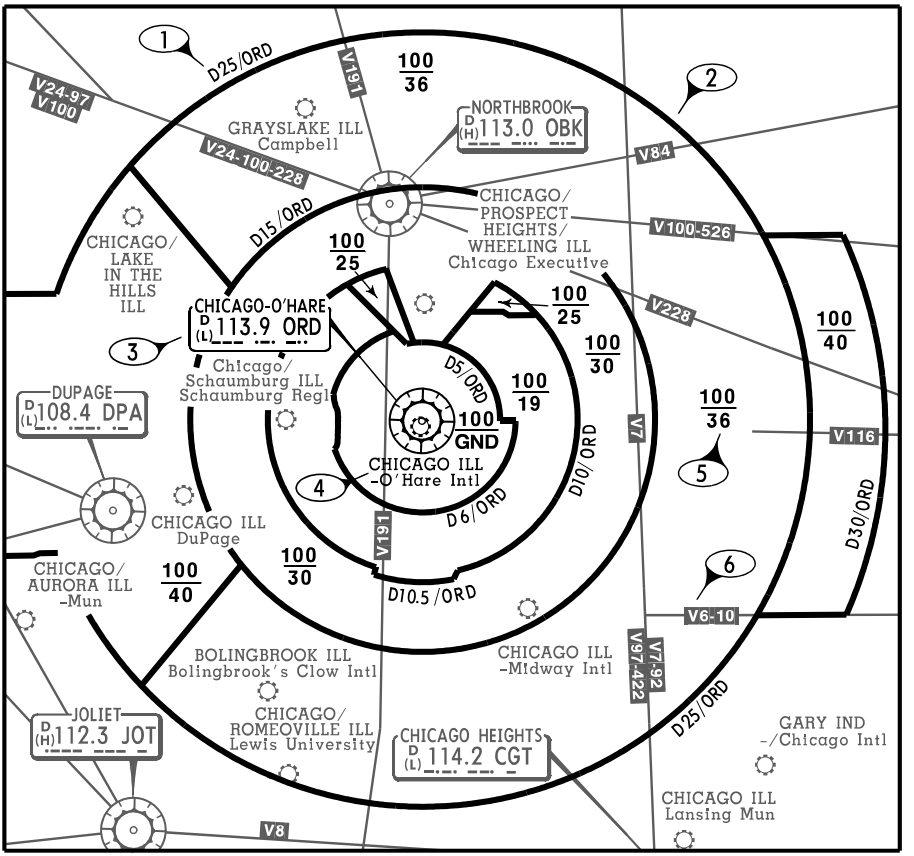
48 — Communications related to Airport listed above Airport label. App/Arr, Dep, Twr and Gnd listed in Chart tabulations. Asterisk indicates part time operation.

10–1B CHART LEGEND

10-1B charts depict the horizontal and vertical limits of Terminal airspace established by official source publications and provide orientation details for flights operating within the area. Associated airport communications are also included.

10-1B charts depicting US Class B airspace also includes general IFR and VFR Flight Procedures appropriate to that particular area.

SAMPLE 10–1B CONTENT



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1 — DME arc distances used to define the Terminal airspace.
2 — Bold line represents the horizontal limits of the Terminal airspace and airspace sectors.
3 — Primary navaid used to further define the horizontal limits of the Terminal airspace.
4 — Primary airport is shown in bold print.
5 — Vertical limits of the Terminal airspace within charted sector in hundreds of feet.
6 — Screened information provided for orientation purposes. This includes airway information, airports and navaids.

END OF ENROUTE CHART LEGEND

27

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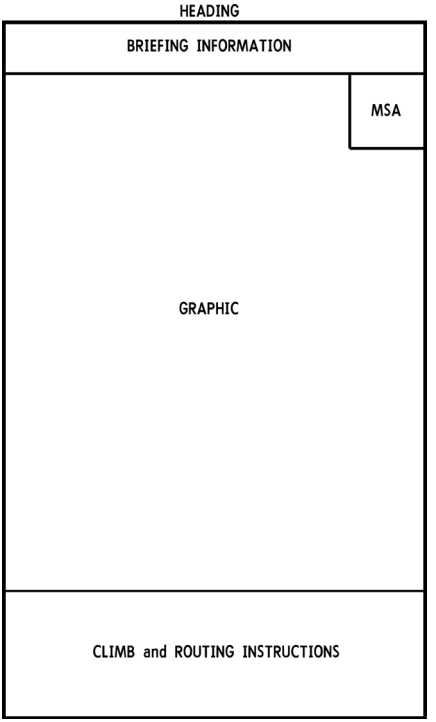
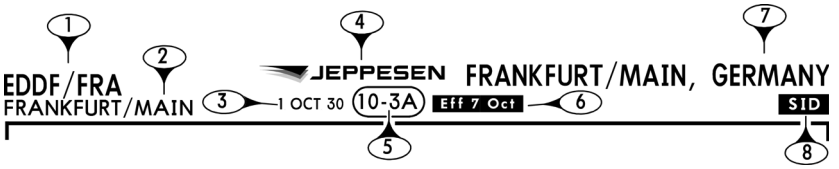
SID/DP AND STAR CHART LEGEND

The SID & STAR section of the Jeppesen legend provides a general overview and depiction of Standard Instrument Departure (SID), Departure (DP), Standard Terminal Arrival Route/Standard Instrument Arrival (STAR), and Arrival charts. 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 supplied by the governing authority. All altitudes shown on SID/DP and STAR charts are MSL unless otherwise specified. All mileages are nautical, all radials and bearings are magnetic unless otherwise specified.



HEADING



1 — ICAO indicators and IATA identifiers.
2 — Airport name.
3 — Chart revision date.
4 — Jeppesen company logo.
5 — Index number.
Charts are sequenced alphabetical or by runway number within similar type arrivals or departures.
6 — Chart effective date.
7 — Geographical location name.
8 — Chart type identifier.

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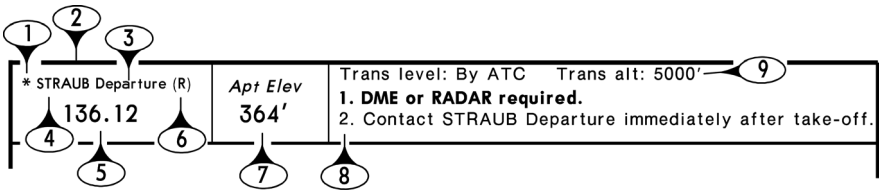
BRIEFING INFORMATION



1 — Indicates the service is part time.

2 — SID/DP Initial Departure Control Services or STAR Weather Services (e.g. ATIS) are depicted.

3 — Function of the service is shown when applicable.

4 — Service call sign is shown when transmit and receive, or transmit only ops are available. The call sign is omitted when the service is broadcast only or has a secondary function.

5 — All available primary frequencies are depicted.

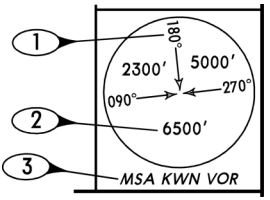
6 — Indicates that radar services are available.

7 — Airport elevation is provided for Arrival/Departure airport.

8 — Procedure restrictions and instructions. Required equipment notes are prominently displayed.

9 — Transition Level and Altitude.

MINIMUM SAFE or SECTOR ALTITUDE (MSA)



1 — Sector defining Radial/Bearing, always depicted inbound for the Navaid, Fix or Airport Reference Point (ARP).

2 — Minimum safe/sector altitude.

3 — Navaid/Fix/ARP the MSA is predicated on.

NOTE: Normal coverage is a 25 NM radius from the forming facility/fix. If the protected coverage is other than 25 NM, that radius is depicted below the forming facility/fix. MSA is provided when specified by the governing authority for any procedure serving the airport.

CLIMB and ROUTING INSTRUCTIONS TABULATED TEXT BOX

Text description might be provided, in addition to the graphic, when it is supplied by the governing authority. Text should be used in conjunction with the graphic to fully understand the procedure to be flown. Neither the text nor the graphic is a stand alone representation of all instructions, speed, and altitude restrictions, but are a combined representation of the procedure.

1 RWY	2 INITIAL CLIMB	4 ALTITUDE
6	Fly runway heading or as assigned for vectors to join filed route.	All aircraft **MAINTAIN 4000′** or assigned lower altitude
24	(SOUTHBOUND) Fly runway heading or as assigned for vectors to join filed route.	
	2 ROUTING	
	EXPECT further clearance to filed altitude within 10 minutes after departure.	

3

Tabulated Text boxes, which include a wide variety of actions, instructions, or restrictions for the pilot, have certain common elements of design for SID, DP and STAR procedures.

1 — General identification applying to certain sections of the procedure, such as Runway, Arrival or SID identification.

2 — Segment of flight, such as Initial Climb, Routing, or Landing may be identified.

3 — Textual description, which compliments the graphic-based depictions or unique instructions, that cannot be graphically represented.

4 — General restriction that cannot be incorporated in the graphic or that would enhance understanding of procedure.

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GRAPHIC — INFORMATION BOXES

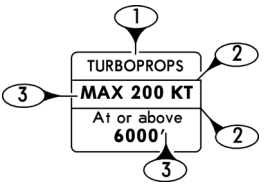
Information boxes are generally tied to the track, fix, or navaid to which the information applies. The content is associated with the graphic depiction on SID, DP, and STAR charts. Information boxes include a wide variety of actions, instructions, or restrictions.

Though information boxes vary widely based on the complexity of procedures, they do have certain common elements of design.

1 — Heading, if included, represent the who, what, where, or why of the information box.

2 — Instruction lines are used to separate instructions and conditions for improved clarity.

3 — Instructions or conditional statements associated with track, fix, navaid, or procedure.



29

GRAPHIC — LOST COMMUNICATIONS PROCEDURE

Unique lost communication instructions, provided by the governing authority for a procedure, are placed within the graphic and are outlined by the lost communication boundary.

GRAPHIC — SPEED RESTRICTIONS

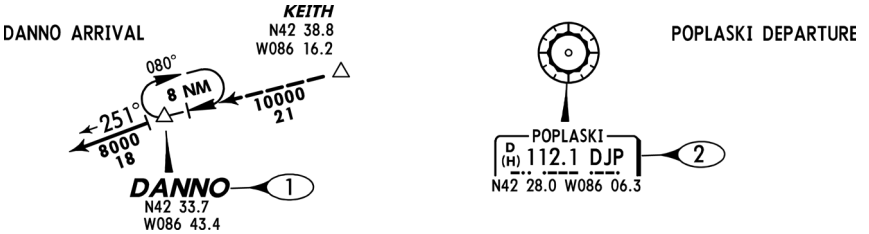
Speed restrictions that apply to the entire procedure are shown below the procedure title.

SPEED: *DO NOT EXCEED 230 KT UNTIL ADVISED BY ATC*

Speed restrictions vary widely within individual procedures. They can be in the tabulated text, boxed, and/or placed in information boxes at the associated track, fix or phase of flight.

GRAPHIC — STARTING POINT AND END POINT OF STAR, DP, AND SID PROCEDURES

Navaids, intersections, or waypoints identified in the procedure title are shown prominently for easy identification of the starting points on STARs, and the ending points on SID or DP procedures.



1 — Intersection or waypoint names are shown in larger text.

2 — Navaid boxes include a shadowed outline.

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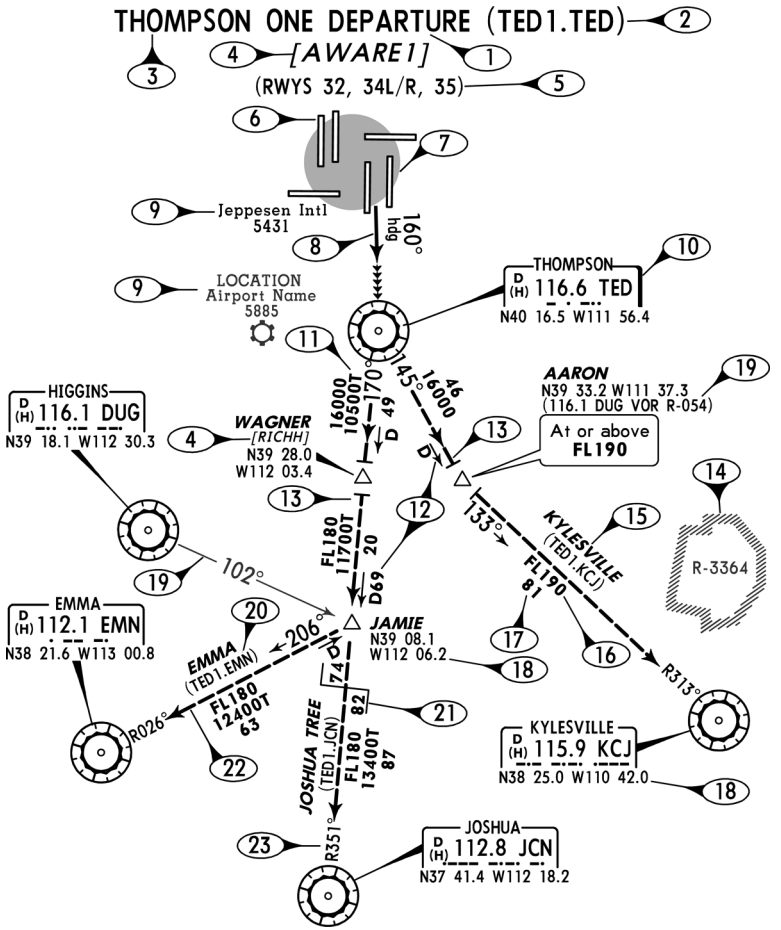
GRAPHIC



1 — Type of procedure.
2 — Arrival/Departure code.
3 — Arrival/Departure name.
4 — Database identifiers are included when different than the Arrival/Departure code or name.
5 — Specified qualifying statements, such as runways, navigational requirements, or aircraft type.
6 — Runway layout is provided for all hard surface runways.
7 — Arrival/Departure airport is highlighted with circular screen.
8 — Arrival/Departure track of procedure represents a common course used by multiple transitions.
9 — Airport is listed only when SID, DP, or STAR also serves multiple airports, which are screened.
10 — Starting Point of STAR and end point of SID/DP procedures are shown prominently.
11 — T placed after altitude denotes a Minimum Obstruction Clearance Altitude (MOCA).
12 — Radial and DME forms the fix. The DME, if not displayed is the segment distance, if shown it is the total distance from the forming Navaid.
13 — Altitude T is placed when the altitude changes along a track at other than a Navaid.
14 — Certain Special Use Airspace Areas are charted when referenced in procedure source.

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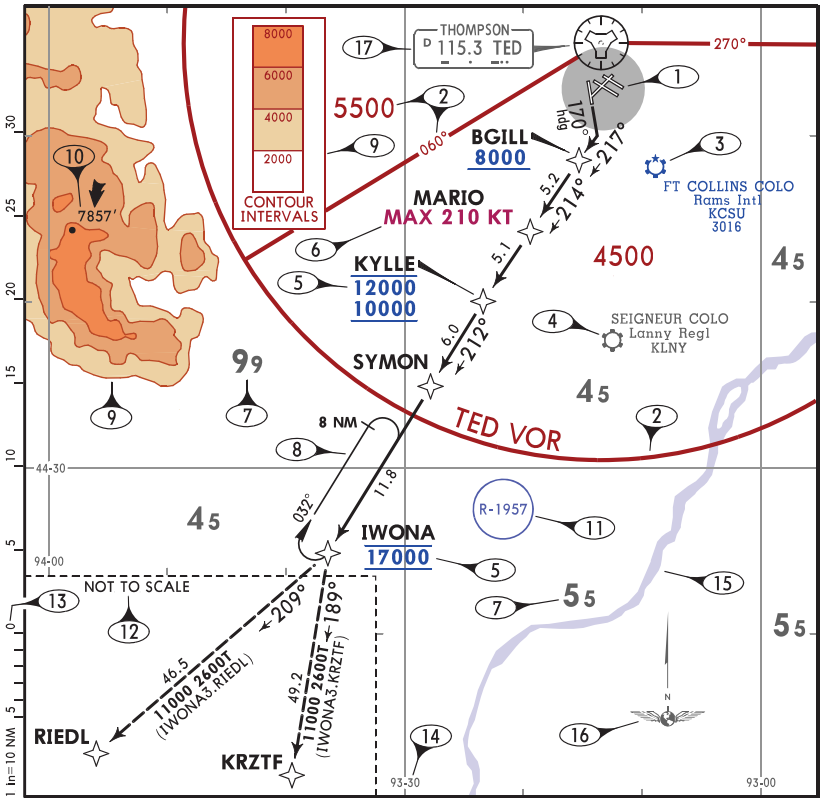
SID/DP AND STAR CHART LEGEND

15 — Transition name placed on the last segment of the SID/DP and the first segment of STAR procedures.
16 — Minimum Enroute Altitude (MEA) unless otherwise designated.
17 — Segment distance.
18 — Coordinates of fix or Navaids.
19 — Formation radials are presented in many ways based on Navaid position & compositional space.
20 — Route identification code.
21 — At the Changeover point, the pilot changes primary navigation to the next Navaid.
22 — Transition track.
23 — VOR radial on which aircraft is flying inbound towards the Navaid.

GRAPHIC — TO SCALE DEPICTION

30 Jeppesen has begun to use a To Scale graphical illustration for Standard Instrument Departure (SID), Departure (DP), Standard Terminal Arrival Route/Standard Instrument Arrival (STAR), and Arrival procedures to enhance terrain/situational awareness. The general philosophy is to depict as much of the area around the arrival/departure airport as possible To-Scale. As a result, there are several differences between our new To-Scale, and the traditional Not-To-Scale, graphic depictions. Those differences are explained below.



1 – Runway diagram of the primary airport is shown using the same scale as the to-scale area of the graphic.
2 – Minimum Sector Altitudes (MSA), indicating the sectors (to-scale) and corresponding altitudes are shown.
3 – For procedures that serve multiple airports, those airports served by the procedure but not considered as the primary are shown using a blue color.

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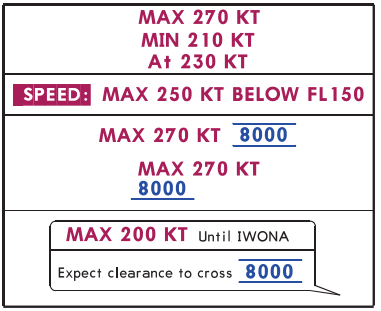
SID/DP AND STAR CHART LEGEND

4 – All IFR airports not served by the procedure that are located within the boundaries of the To-Scale portion of the procedure graphic are shown using a subdued grey color. For procedures under the jurisdiction of the FAA, only those airports not served by the procedure and with at least one hard surface runway 6000' or greater in length will be shown using a subdued grey color.

5 – Procedure altitude restrictions are depicted blue in color and use line-work above and or below the value to indicate usage. See the following table for the meaning of each depiction:

Depiction	Altitude Usage
8000	Minimum Altitude At or Above Altitude Above Altitude
8000	Maximum Altitude At or Below Altitude Below Altitude
8000	Recommended Altitude
8000	Mandatory Altitude At Altitude
12000 10000	Minimum & Maximum Altitudes Between Altitudes

6 – Speed restrictions are shown in magenta. Speed restrictions are at times, combined with procedure altitudes.



7 – Within To-Scale areas grid MORAs will be depicted with latitude/longitude defining the applicable sector. Sectors are formed by 30 minutes or one degree of latitude and longitude. The MORA value is shown using a large and small number. The large numbers represent thousands and the small numbers represent truncated hundreds. All Grid MORA values are shown using a grey color.

8 – Holding pattern leg lengths are depicted to scale. When a holding limit has been defined as a DME distance or NM leg length, those limits are shown along the outbound leg. A waypoint/intersection with an H represents an associated hold. An inset is placed on the procedure graphic with the associated hold.

9 – Generalized terrain contours may be depicted based on several geographic factors. The elevation values applicable to the contour lines shown are indicated within a contour legend.

10 – The highest terrain high point or man-made structure that falls within the To-Scale portion of the graphic is shown and highlighted with an arrow.

11 – Special use airspace that has been identified by the State Authority as having significance are shown with a blue line indicating the outer boundaries.

12 – NOT TO SCALE insets will be used for the depiction of transition information when the chart scale used does not facilitate a to-scale depiction of the entire procedure. Information within the area indicated is depicted not to scale.

13 – The scale used for graphic depiction is indicated.

14 – Latitude/Longitude tics are shown in 10 minute increments along the neat line. The appropriate 30 minute or 1 degree tics are extended to form the MORA grid.

15 – Large rivers and water bodies are shown.

16 – Normally the graphic will be oriented with north being towards the top of the chart. At times a much better depiction can be obtained by using a different orientation. A north arrow is always shown to indicate the type of orientation used.

17 – Secondary navaid boxes, for navaids not directly used for procedure navigation, will be depicted using a grey color to differentiate them from primary navaids.

END OF SID/DP AND STAR LEGEND

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AIRPORT QUALIFICATION/FAMILIARIZATION

AIRPORT QUALIFICATION PAGES

U.S. Federal Aviation Regulations (FAR) Part 121.445 specifies pilot in command special airport qualifications. The (FAA) Administrator may determine that certain airports (due to items such as surrounding terrain, obstructions, or complex approach or departure procedures) are special airports requiring special airport qualifications. These requirements do not apply when an entry to that airport (including a takeoff or a landing) is being made if the ceiling at that airport is at least 1,000 feet above the lowest MEA or MOCA, or initial approach altitude prescribed for the instrument approach procedure for that airport, and the visibility at that airport is at least 3 miles.

At other times, no certificate holder may use any person, nor may any person serve, as pilot in command to or from an airport determined to require special airport qualifications unless, within the preceding 12 calendar months:

31

a. The pilot in command or second in command has made an entry to that airport (including a takeoff and landing) while serving as a pilot flight crewmember; or
b. The pilot in command has qualified by using pictorial means acceptable to the Administrator for that airport.

Airport qualification pages, when approved by the certificate holder's Principal Operations Inspector (POI), provide an acceptable means of complying with the above requirement.

The list of special airports is found in the Handbook Bulletin for Air Transportation (HBAT) 03-07. The list is also accessible through the following web site:

http://www.opspecs.com/ops/SpecialPICAirports/

AIRPORT FAMILIARIZATION PAGES

Airport familiarization pages are similar to qualification pages, except the familiarization airports are not currently considered a special airport under FAR 121.445. However as with qualification pages, familiarization pages depict airports that are also unique due to items such as surrounding terrain, obstructions, or complex approach or departure procedures.

ICAO

DOC 7300, Annex 6 specifies that a pilot in command must be currently qualified to be used on a route or route segment. Each such pilot shall demonstrate to the operator an adequate knowledge of aerodromes which are to be used including such things as knowledge of terrain, minimum safe altitudes, and seasonal meteorological conditions. In another provision, an operator may qualify a pilot in command to land at an aerodrome by means of an adequate pictorial presentation.

According to the state authority's recommendation or on the operator's individual decision, both airport qualification and airport familiarization pages can be used for professional familiarization of specific airports.

DESCRIPTION OF SERVICE

The front side of the overview page provides an aerial image of the airport. The overview image will include key areas of interest surrounding the airport, such as obstructions that could affect flight operations. Below the image is a graphic presentation of the airport and surrounding area. The graphic portion includes airways, navigation aids, general terrain contours, water, roads and city patterns. The graphic also includes an overview arrow that indicates the direction from which the image is viewed.

The reverse side of the overview page provides a textual description of the airport and its surrounding area. The textual description points out key items of interest about the airport, as well as the surrounding area. An annual weather table is also provided on the second half of the page. This table is based on seasonal data and represents average monthly values.

Runway pages portray the airport's primary runways. The top portion of the page provides a view of the approach end of the runway, as seen during the landing phase of flight. Below is a narrative that provides specific information and unique features relating to the runway. The reverse side of the page provides the same type of information for the opposite end of the runway.

All airport pages are updated as significant changes dictate. In addition, Airport Qualification locations are reissued every 24 months.

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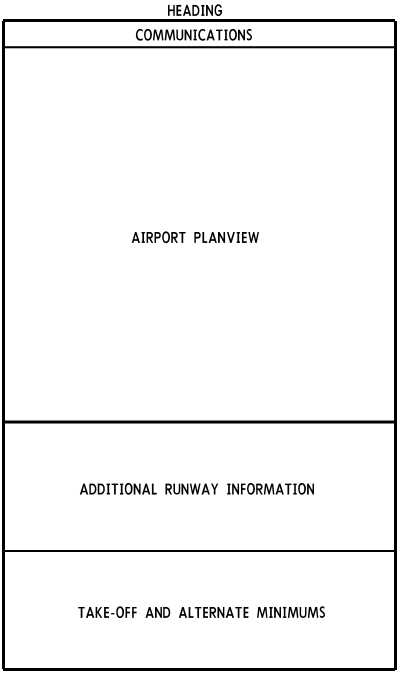
AIRPORT CHART LEGEND

AIRPORT

NOTE: This section of the Jeppesen legend provides a general overview regarding the depiction of airport diagrams and associated information.

The following briefly explains the symbology used on airport charts throughout the world. Not all items explained apply to all charts. The airport chart is divided into specific areas of information as illustrated below. To enhance the usability for larger airports, the Communications and Airport Planview sections are depicted on one side of the chart. An added Notes Section along with the Additional Runway Information, Take-off minimums, and Alternate minimums sections are depicted on the reverse side of the chart.

FORMAT



HEADING

1 — ICAO indicators and IATA airport identifiers.
2 — Airport elevation.
3 — Airport geographic latitude and longitude shown in degrees, minutes, and tenths of minutes.
4 — Chart index number. Same as the first approach chart when the airport chart is printed on the reverse side.
5 — Chart revision date.
6 — Chart effective date.
7 — Airport name.
8 — Geographic location name.
9 — Jeppesen company logo.

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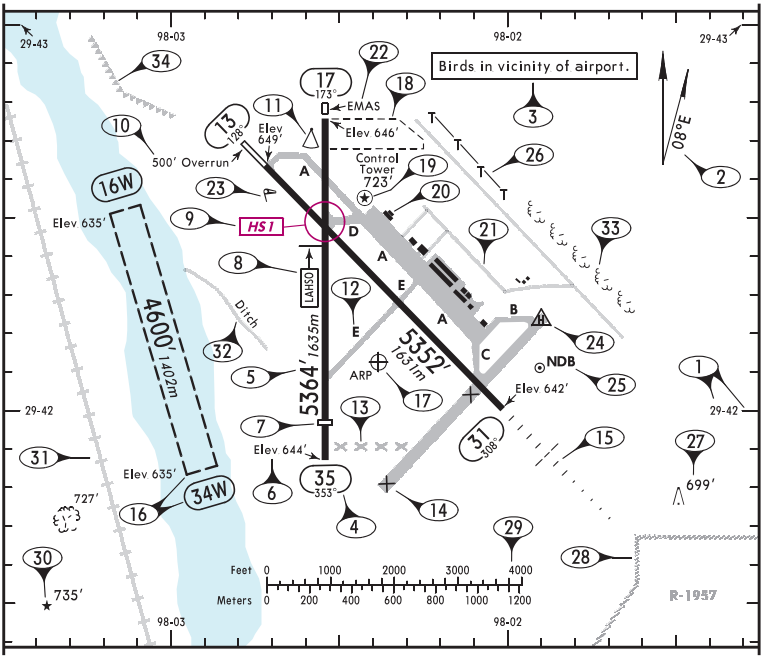
AIRPORT CHART LEGEND

COMMUNICATIONS

For Communications Information See Approach Chart Legend — Page APPROACH-2

AIRPORT PLANVIEW



1 — The planview is a "To Scale" graphical depiction of the airport layout, a latitude/longitude grid in degrees, minutes, and tenths of minutes is depicted along the inside of the neat line.

2 — The airport magnetic variation is graphically and numerically depicted.

3 — Airport operational notes are placed within the planview. Notes pertaining to a specific area are placed within the area or tied to it.

4 — Runway designators (numbers) are magnetic unless followed by a "T" for true. Runway bearings are included when known.

5 — Physical length of the runway which does not include stopways, overruns, or adjustments for displaced thresholds. Shown in feet with the meter equivalent included at International Airports.

6 — The runway end elevation is depicted when known.

7 — When applicable, the physical location of displaced thresholds along the runway are shown.

8 — Stopping points along the runway are depicted for Land and Hold Short Operations.

9 — "Hot Spot" areas are depicted along with a corresponding label when applicable. A textual description is included within the planview or below the additional runway information band.

10 — When available, stopways and overruns are depicted with the applicable length.

11 — When known, the location of RVR transmissometers are shown with any applicable identifiers.

12 — All active taxiways and ramp areas are depicted using a grey area fill color. All taxiway identifiers and ramp names are included when known.

13 — All known permanently closed taxiways are shown.

14 — One of two depictions is used for closed runways depending on the nature of the closure:

a. Lengths and designators (numbers) are retained when the closure is temporary.

b. Lengths and designators (numbers) are removed when the closure is permanent.

15 — The configuration and length of all known approach light systems are shown.

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AIRPORT CHART LEGEND

16 — All seaplane operating areas/water runways a re shown. Runway numbers are followed by a "W", the physical length is included along with elevations.

17 — The geographical location of the Airport Reference Point (ARP) is depicted when known.

18 — Areas under construction are outlined using a light dashed line.

19 — When known, the location of the airport identification beacon is shown.

20 — Buildings on or near the airport are depicted.

21 — Roads on or near the airport are depicted if referenced in a Caution, Alert or Be Aware note.

22 — Location of Engineered Materials Arresting System (EMAS) pads are shown and labeled.

23 — All known wind direction indicators are depicted.

24 — Helicopter landing pads/areas.

25 — The geographical location of on airport VORs and NDBs is indicated and labeled.

26 — Pole lines that are on or near the airport are depicted.

27 — All known terrain high points and man-made structures with an elevation 50 feet above the nearest rwy end elevation are depicted. The applicable symbol and elevation are shown.

28 — Special use airspace, area outline and designator are depicted. A note, "Entire Chart Lies Within R-XXXX", is shown when the entire chart planview falls within a particular area.

33

29 — A scale for both feet and meters that is equivalent to the chart scale is shown.

30 — Hazard beacons within the planview are depicted along with an elevation if known.

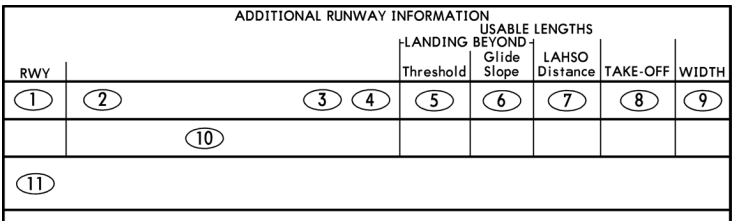
31 — Railroads on or near the airport are depicted if referenced in a Caution, Alert or Be Aware note.

32 — Ditches in the vicinity of the airport are depicted.

33 — Tree lines are depicted. An open ended tree line indicates the border of a forested area.

34 — Bluffs are shown with the arrows of the symbol pointing down, or toward lower elevation.

ADDITIONAL RUNWAY INFORMATION BAND



NOTE: For an explanation of the abbreviations used within the Additional Runway Information Band, see the Abbreviations Section. All distances depicted in the Additional Runway Information Band are in feet, the meter equivalent is also shown at International airports.

1 — Runway designators/numbers are depicted in the upper left and lower right corners of the box. All information shown to the right within the band applies to the indicated runways. When the information differs between runways, the band is separated with a line.

2 — All operational runway lighting and approach light systems are listed.

3 — Runway surface treatment (grooving) is indicated.

4 — "RVR" is depicted when one or more transmissometers are installed along the runway.

5 — When different from the physical runway length, landing distance beyond threshold is shown.

6 — When applicable, the distance from a point abeam the glide slope transmitter to the roll-out end of the rwy is shown. For PAR, the distance is from the GS interception with the runway.

7 — At airports with Land And Hold Short Operations (LAHSO), the distance from the runway threshold to the designated hold short point is shown.

8 — When take-off length is restricted, the physical rwy distance available for take-off is shown.

9 — The physical width of the runway is shown.

10 — This band is expanded to show information for all operational runways in numerical order.

11 — All notes related to the runway information depicted are shown in this section.

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AIRPORT CHART LEGEND

TAKE-OFF MINIMUMS (Eff Jan 2020)

Publication of take-off minimums does not constitute authority for their use by all operators. Each individual operator is responsible for ensuring that the proper minimums are used based on authorization specific to the type of operation.

Take-off minimums are supplied for all airports. When the Governing State Authority has not provided take-off visibilities, they will be derived by Jeppesen based on ICAO Doc 9365 Manual of All Weather Operations. For take-off minimums rules and tables refer to AIR TRAFFIC CONTROL — Aerodrome Operating Minimums JEPPESEN.

A “Std” label in the upper left corner of the minimums box indicates that the published visibilities are ICAO Doc 9365 compliant. Other labels, as described in Landing Minimums Legend, indicate compliance with other regulations.

Wide variations exist regarding take-off minimums depending on the governing agency, typically though they consist of a visibility/ceiling and associated required conditions for use.

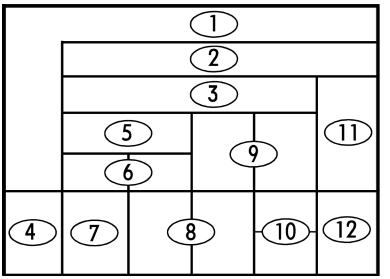
Generally, take-off minimums are shown in order of best (lowest) to worst (highest) starting at the top left and progressing to the bottom right of the format. This applies to the overall minimums box as well as for a particular runway or set of runways. Runway numbers will only be included if the State provides specific take-off minimums for a particular runway. The charted take-off minimums depend on runway lighting/equipment but may not be applicable for all runways. Pilots have to select the correct column according to the operational runway lights/equipment.

VIS and ceiling values are shown in feet, statute miles, meters or kilometers. RVR is shown in hundreds of feet or whole meters.

A VIS is always labeled with “V”, an RVR is always labeled “R” and values which could be both are labeled “R/V”.

Altitudes listed within climb gradients requirements are above Mean Sea Level (MSL). Ceilings specified for take-off are heights Above Airport Level (AAL).

Typical format used for charting take-off minimums:



1 — Take-off minimums header indicating the contents of the minimums box.

2 — If required, runway number/numbers, minimums below apply to the designated runway(s).

3 — General conditions, those that affect a wide range of the depicted minimums.

4 — If required, type of aircraft information is depicted here, typically in the form of number of aircraft engines or aircraft approach categories as published by the State.

5 — More specific conditions, those that affect only a few of the minimums.

6 — Very specific conditions, those that affect only the minimums directly below.

7 — Ceilings and RVR/met VIS authorized based on the conditions and runways listed above. When ceiling and visibilities are listed, both are required. In this format example, the minimums of this column would represent the best (lowest) available take-off minimums.

8 — Ceilings and visibilities authorized based on the conditions above, minimums typically become “higher” with less restrictions.

9 — The use of abbreviations is prevalent within the take-off minimums band given that many of the conditions/restrictions have lengthy explanations. See Chart Glossary and Abbreviations section for a more detailed description.

10 — The take-off minimums for a given set of conditions can differ based on aircraft type. Separate minimums are depicted for each aircraft type scenario.

11 — Usually the term “Other” is used to describe take-off minimums having no conditions.

12 — This being the farthest minimum box to the right, it would generally contain the highest set of take-off minimums with the least number of conditions for that particular runway.

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AIRPORT CHART LEGEND

13 Std/State	14 TAKE-OFF							
15 Rwys 07C/R, 18, 25L/C [2]								
16 Low Visibility Take-off								
[1] HIRL & CL (spacing 15m or less) & relevant RVR	RL & CL & relevant RVR	RL & CL	RL & RCLM	RL or CL	RL or RCLM	RL or CL	Adequate Vis Ref	
			DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
TDZ R125m Mid R125m Rollout R125m	TDZ R150m Mid R150m Rollout R150m	R200m	17 R300m		18 R/V400m		R/V500m	NA
[1] RWY 07C/R, 25L/C: RVR 75m with approved lateral guidance system or HUD/HUDLS. [2] RWY 07L/25R: NA								

19

13 — Minimums Label: Indicates that take-off minimums are compliant with a specific regulation, but never below State published values. For description of different labels refer to Landing Minimums Legend.

14 — Depending on the charted information the title simply refers to TAKE-OFF or contains additional information, e.g. DEPARTURE PROCEDURE.

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15 — Runway numbers will only be listed if take-off minimums for the runways are different or if a runway is not authorized for take-off. This could happen because of State provided take-off minimums or restrictions.

16 — All operators should be aware that in some cases (e.g. “Approved Operators”, “Low Visibility Take-off”) a special approval is required prior to the use of these minimums.

17 — “R” means RVR.

18 — “R/V” means that the value could be both, RVR and meteorological VIS.

19 — All notes that pertain directly and only to the charted take-off minimums are depicted directly under and adjacent to the take-off minimums box.

Samples

Std	TAKE-OFF						
[1] HIRL & CL (spacing 15m or less) & relevant RVR	RL & CL & relevant RVR	RL & CL	RL & RCLM	RL or CL	RL or RCLM	Adequate Vis Ref	
			DAY	NIGHT	DAY	DAY	NIGHT
TDZ R125m Mid R125m Rollout R125m	TDZ R150m Mid R150m Rollout R150m	R200m	R300m		R400m	R/V500m	NA
[1] RWY 18, 25L, 25R: TDZ/Mid/Rollout R75m with approved lateral guidance system.							

Std	TAKE-OFF						
[1] HIRL & CL (spacing 15m or less) & relevant RVR	RL & CL & relevant RVR	RL & CL	RL & RCLM	RL or CL	RL or RCLM	Adequate Vis Ref	
			DAY	NIGHT	DAY	DAY	NIGHT
TDZ R4 Mid R4 Rollout R4	TDZ R5 Mid R5 Rollout R5	R6	R10		R12	R16 or V1/4	NA
[1] RWY 18, 25L, 25R: TDZ/Mid/Rollout R3 with approved lateral guidance system.							

Depiction of Take-off Minimums based on ECOMS tables and rules

Refer to www.jeppesen.com/aom

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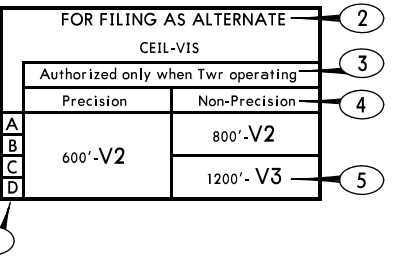
AIRPORT CHART LEGEND

ALTERNATE MINIMUMS (Eff Jan 2020)

Only those alternate minimums that have been published by the governing State Authority specifically for the landing airport will be charted. The values shown will be those supplied by the State.



1 — Typically alternate minimums are based on the landing minimums applicable to the available approach procedures at the landing airport. As a result, the subsequent alternate minimums relate to the aircraft approach categories. Aircraft categories are not shown if the same alternate minimums are applicable for all aircraft categories.

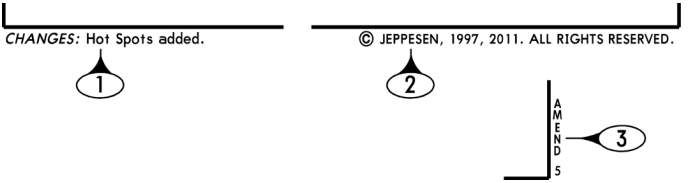
2 — The alternate minimums box is labeled as such.

3 — All applicable conditional notes are shown directly above the minimums they apply to.

4 — Approach procedure idents or classification for all appropriate procedures with the applicable alternate minimums charted directly below.

5 — Visibilities used in alternate minimums are shown in feet, statute/nautical miles, meters and kilometers as provided by the State. RVR values in feet and meteorological VIS values in statute/nautical miles are not labeled, for example: “R40” means RVR 4000 feet and “V2” means a meteorological VIS of 2 miles. Values in meters are labeled with an “m” and kilometers with a “km”. Ceiling values are always shown in feet or meter as reported by the State and are shown in front of the meteorological VIS.

CHART BOUNDARY LINE INFORMATION



1 — A brief summary of the changes applied to the chart during the last revision.

2 — Jeppesen Copyright label.

3 — Shown when source amendment information has been supplied by the State. Normally these amendment numbers directly relate to the take-off or alternate minimums.

END OF AIRPORT CHART LEGEND

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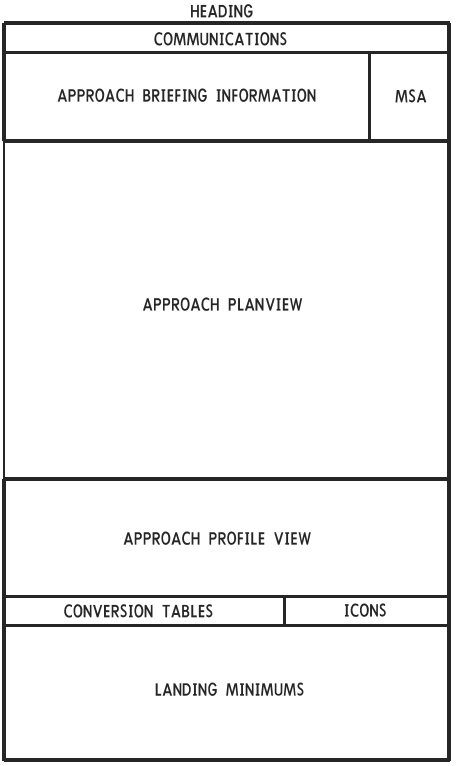
APPROACH CHART LEGEND

APPROACH

NOTE: This section of the Jeppesen legend provides a general overview regarding the depiction of approach procedures.

Approach charts are graphic representations of instrument approach procedures prescribed by the governing authority. All altitude depicted are minimum altitudes unless specified otherwise. All altitudes are MSL.
All mileages are nautical, all radials and bearings are magnetic unless otherwise specified. The following briefly explains the symbology used on approach charts throughout the world. Not all items explained apply to all charts. The approach chart is divided into specific areas of information as illustrated below.

FORMAT



HEADING

1 — ICAO indicators and IATA airport identifiers.
2 — Airport name.
3 — Index number. Charts are sequenced by runway number within similar type approaches.
4 — Chart revision date. Without effective date chart is effective on receipt.
5 — Chart effective date.
6 — Procedure identification.
7 — Geographical location name.
8 — Jeppesen company logo.

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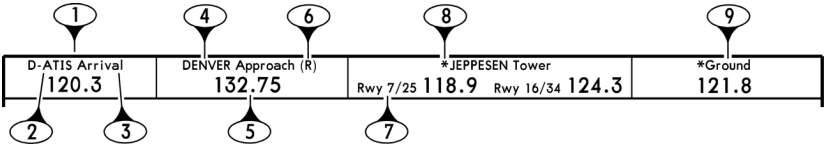
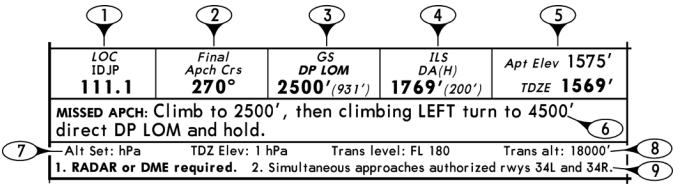
APPROACH CHART LEGEND

COMMUNICATIONS

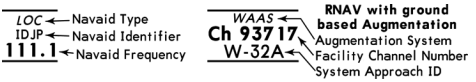


1 — Communications are shown left to right in the order of normal use.
2 — Communication service, call sign is omitted when the service is broadcast only.
3 — Functionality of the service is shown when applicable.
4 — The service call sign is shown when transmit & receive or transmit only operations are available.
5 — All available primary frequencies are depicted, when applicable G, T and X designations are added respectively for Guard, Transmit and Request.
6 — Indicates that radar services are available.
7 — Sectors are defined for each frequency when applicable.
8 — Indicates the service is part time.
9 — When the service is a secondary function, the call sign is omitted.

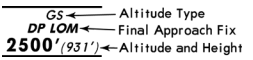
APPROACH BRIEFING INFORMATION



1 — Approach primary Navaid.



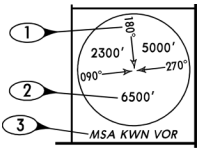
2 — Final approach course bearing.
3 — Crossing altitude at the FAF. Glide slope crossing altitude for precision approaches. Procedure altitude (Vertical Descent Altitude or Minimum Crossing Altitude) for non-precision approaches.



4 — Lowest DA(H) or MDA(H).
5 — Airport Elevation and Touchdown Zone/Threshold Elevation.
6 — Textual description of the Missed Approach Procedure.
7 — Altimeter Setting Information, Barometric Pressure Equivalents are included.
8 — Airport/Procedure Transition Level and Altitude.
9 — Notes applicable to the Approach Procedure.

MINIMUM SAFE or SECTOR ALTITUDE (MSA)

1 — Sector defining Radial/Bearing, always depicted to the Navaid/Fix or Airport Reference Point (ARP).
2 — Minimum safe/sector altitude.
3 — Navaid/Fix/ARP the MSA is predicated on.



NOTE: Normal coverage is a 25 NM radius from the forming facility/fix. If the protected coverage is other than 25 NM, that radius is depicted below the forming facility/fix.

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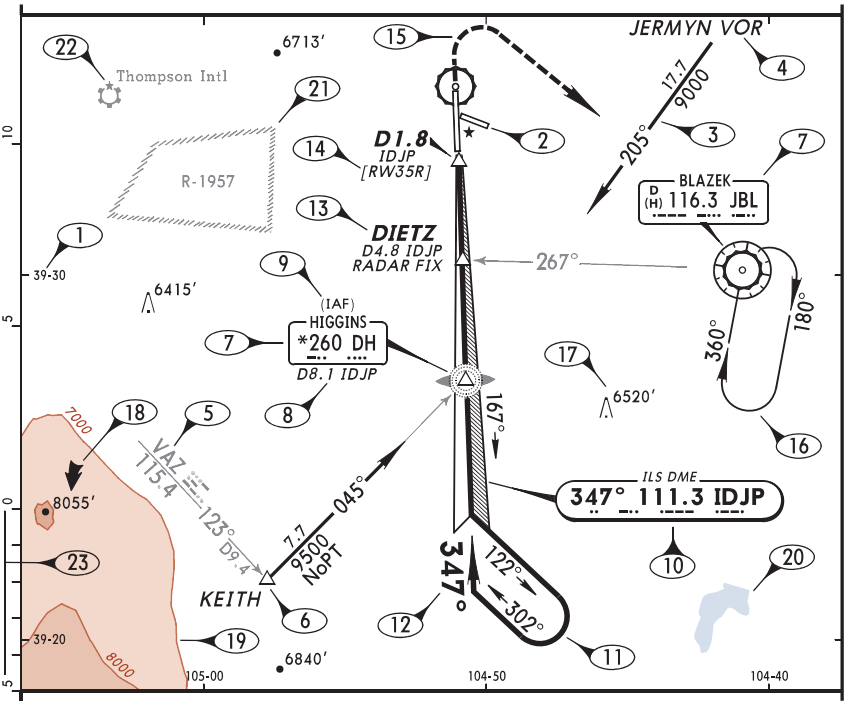
APPROACH PLANVIEW



1 — The planview is a graphical "To Scale" depiction of the approach procedure. Latitude and longitude tics are shown in 10 minute increments along the neatline.

2 — Complete runway layout is depicted for the primary airport.

3 — Approach transitions are depicted with a medium weight line. The bearing is normally inset within the track with the mileage and associated altitude placed along the track.

4 — Off-chart origination navaid/waypoint name. Navaid frequency, ident, and Morse code is shown when required for fix formation.

5 — VOR cross radials and NDB bearings used in forming a fix. DME formation distances are shown when applicable. Navaid frequency, ident, and Morse code shown as required.

6 — Airspace fixes depicted using several different symbols according to usage.

7 — Navaid boxes include the navaid name, identifier, Morse code, and frequency. A letter "D" indicates DME capability with an asterisk indicating part time.

8 — Substitute fix identification information located below facility box when applicable.

9 — Initial Approach Fixes and Intermediate Fixes are labeled as (IAF) and (IF) respectively.

10 — A shadowed navaid box indicates the primary navaid upon which lateral course guidance for the final approach segment is predicated.

11 — The final/intermediate approach course is indicated with a heavy weight line.

12 — The final approach course bearing shown in bold text, with a directional arrow as needed.

13 — Airspace fix names are shown near or tied to the fix, formational info is placed below name.

14 — Jeppesen-derived database identifiers are depicted when different from State-supplied name.

15 — The missed approach segment is shown with heavy weight dashed line work.

16 — Holding/Racetrack patterns are shown with both inbound and outbound bearings. Restrictions are charted when applicable, heavy weight tracks indicate the holding/racetrack is required.

17 — Some, but not all, terrain high points and man-made structures are depicted along with their elevations. Generally only high points 400’ or more above the airport elevation are shown.

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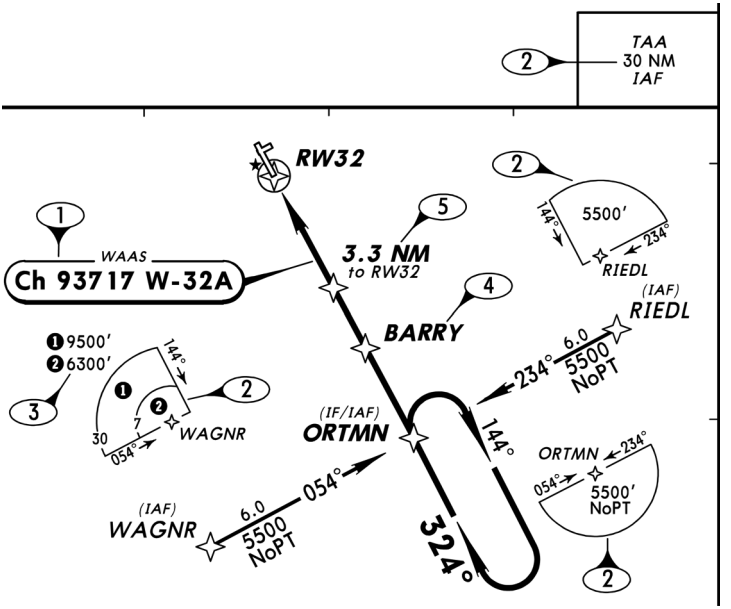
18 — Arrow indicates the highest of the portrayed high points within the planview area only.
19 — Generalized terrain contours may be depicted based on several geographic factors.
20 — Rivers/large water bodies are shown. Smaller and seasonal water areas are not depicted.
21 — Some, but not all, Special Use Airspace boundaries and identifiers are depicted.
22 — All secondary IFR airports, and VFR airports that lie under the final approach, are depicted.
23 — Charting scale used is indicated along the left side of the planview.

APPROACH PLANVIEW — RNAV PROCEDURE DIFFERENCES



1 — A primary navaid box is shown for RNAV approach procedures augmented by ground based facilities. The system type, channel, and system approach ID are shown.
2 — Some RNAV procedures utilize Terminal Arrival Area/Terminal Area Altitude (TAA). A graphical depiction of each TAA sector is placed within the planview in the corresponding area. The TAA's foundational waypoint is depicted along with the forming bearings, arrival altitudes, and applicable NoPT labels. Generally the TAA replaces the MSA as indicated in the MSA box.
3 — When the normal TAA coverage of 30 NM (25 NM ICAO) from the base waypoint is modified, the segmented areas are depicted with the applicable altitudes indicated.
4 — Due to the required use of a database, only waypoint names are shown. Formations and coordinates are omitted.
5 — Along track distances, normally to the next named waypoint, are shown per source for un-named waypoints.

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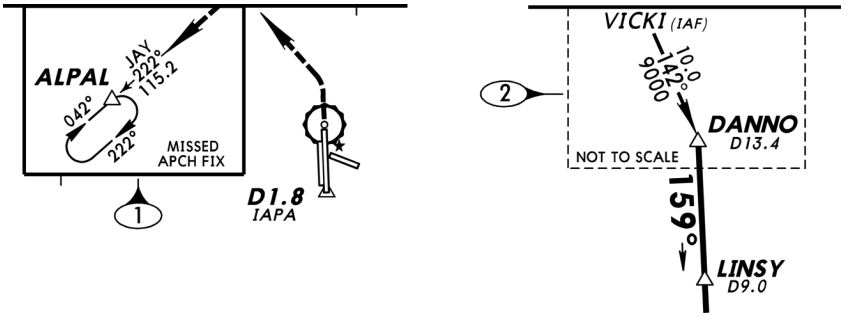
APPROACH CHART LEGEND

APPROACH PLANVIEW — NOT TO SCALE INSETS



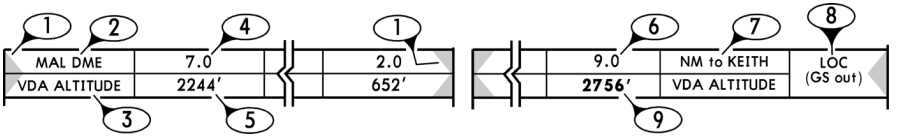
Insets are used to portray essential procedural information that falls outside of the planview boundary. The use of insets facilitates larger scales for depicting core segments of the procedure.

37

1 — A solid line is used to outline the inset when the information has been remoted from the associated "To Scale" tracks. Labels inside the inset indicate the usage of the contained procedural information.

2 — A dashed line is used to outline the inset when the information remains in line with the associated "To Scale" tracks. A NOT TO SCALE label is included inside the inset.

NON-PRECISION RECOMMENDED ALTITUDE DESCENT TABLE



General Description: The Recommended Altitude Descent table, shown to facilitate the CDFA technique, contains "check" altitudes that correlate directly to the Vertical Descent Angle (VDA) used in conjunction with the final approach segment of the procedure. When the State Authority has not supplied this information, Jeppesen will derive the altitudes based on the procedure VDA.

1 — The direction of the Recommended Altitude Descent table, top of descent down, is sequenced in the same direction as the flight tracks in the profile. A grey arrow indicates this left-to-right or right-to-left direction.

2 — The source for the DME "checkpoints" is indicated by the navaid ident. When the table is Jeppesen-derived, DME is used whenever possible for the establishment of the checkpoints.

3 — The row of recommended altitudes is labeled to indicate their associated use with the VDA.

4 — The DME distance that defines each checkpoint is depicted in whole and tenths of a NM.

5 — A recommended altitude, (which is defined by a position along the VDA at a given point) is supplied corresponding to each checkpoint in the table.

6 — When DME is not available, each checkpoint will be defined by a distance to a fix along the final approach course. This distance is shown in whole and tenths of a NM.

7 — The "to" waypoint is indicated when checkpoints are defined by a distance to a fix.

8 — When a Non-Precision approach is combined with a Precision approach, a qualifier is added to indicate that the depicted recommended altitudes relate to the non-precision approach only.

9 — Bold text indicates the altitude is charted in the FAF altitude box within the Briefing Strip.

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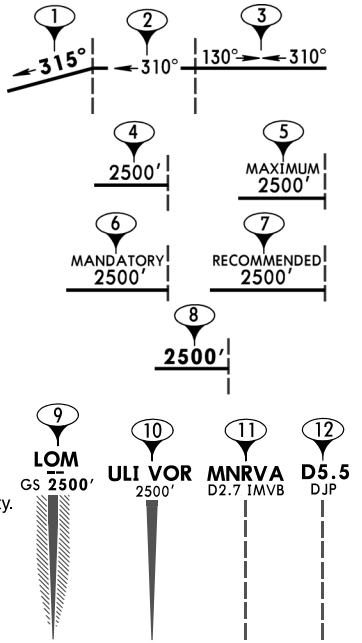
APPROACH CHART LEGEND

APPROACH PROFILE VIEW

The Profile View graphically portrays the Final/Intermediate segments of the approach. A Not To Scale horizontal and vertical cross section is used.



1 — All procedure bearings are shown. Bold text is used to emphasize the Final Approach Course. Arrowheads are added as needed to indicate direction of flight.

2 — Bearings are placed either above, below, or inset in the track.

3 — Both inbound and outbound bearings are depicted for procedure holding/racetrack patterns.

4 — All altitudes depicted in the profile view are MINIMUM altitudes unless specifically labeled otherwise. All altitudes are above mean sea level in feet (AMSL).

5 — Maximum altitudes: may be abbreviated "MAX".

6 — Mandatory altitudes: abbreviations are not used.

7 — Recommended altitudes: abbreviations are not used.

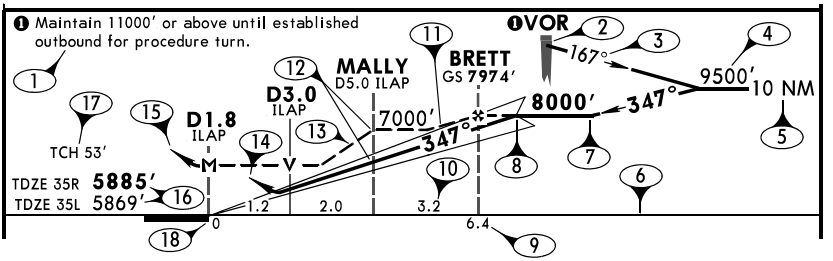
8 — Bold text is used to emphasize the procedure altitude at the FAF or the GS intercept altitude at the FAP/FAF. This is also the altitude shown in the Briefing Strip.

9 — The type of navaid is indicated. Identifying Morse code is shown for all markers. When known, glide slope crossing altitudes are included.

10 — The Navaid ident or name is included where confusion may occur. Crossing altitudes associated with a vertical descent angle are included when applicable, may be labeled for clarity.

11 — All fix names are shown along with any DME formations. The ident of the source DME is included when multiple DME sources are charted.

12 — Stand-alone DME fixes are depicted similar to named waypoints.



1 — Procedure notes that relate directly to information portrayed in the profile view are charted within the profile view, normally placed in the upper right or left corners.

2 — A "broken" navaid or fix symbol indicates that it does not fall directly in line with the final approach track.

3 — Outbound bearings associated with procedure turns are included for situational awareness.

4 — Minimum altitude while executing the procedure turn.

5 — The distance to remain within while executing the procedure turn. Distance is measured from the initiating navaid/fix unless otherwise indicated.

6 — Profile view "ground line". Represents an imaginary straight line originating from the runway threshold. No terrain high points or man-made structures are represented in the profile view.

7 — Procedure flight tracks are portrayed using a thick solid line. Multiple separate procedures using the same altitudes are represented by a single line.

8 — Final Approach Point (FAP). Beginning of the final approach segment for precision approaches.

9 — Nautical Mile (NM) distance to the "0" point. Not included at DME fixes.

10 — Nautical Mile (NM) distance between two navaids and or fixes.

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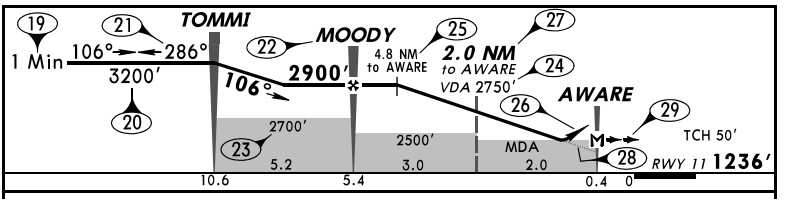
APPROACH CHART LEGEND

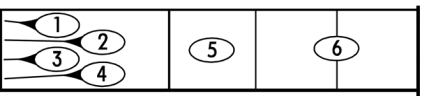
11 — Final Approach Course bearing. Only repeated if a change in course occurs.
12 — Tracks are placed relative to each other based on the corresponding crossing altitudes.
13 — Non-precision procedure flight tracks that deviate from the Glide Slope and or the Vertical Descent Angle are depicted as a dashed line.
14 — Pull-up representing the DA/MDA or when reaching the descent limit along the GS/VDA.
15 — Pull-up arrow associated to a non-precision approach not using a CDFA technique.
16 — Touchdown zone, runway end, or threshold elevation labeled accordingly.
17 — Threshold crossing height associated to the charted glide slope or vertical descent angle.
18 — Runway block symbolizing the runway. The approach end represents the runway threshold.



19 — Time limit applicable to the outbound leg of the procedure holding/racetrack.
20 — Minimum altitude while executing the procedure holding/racetrack.
21 — Outbound and inbound bearings associated to the procedure holding/racetrack.
22 — RNAV waypoints are identified by their five character identifier only.
23 — Segment Minimum Altitudes (SMA) are represented by a shaded rectangle bordered by the two defining fixes. The minimum altitude is shown along the top edge of the sector.
24 — Altitudes that correspond to the VDA.
25 — Nautical miles to the next fix is supplied for the “Top of Descent” when not at a fix.
26 — Pull up along the VDA at the DA/MDA is depicted relative to the missed approach point.
27 — Nautical miles and name of "to" fixes are supplied for all along track distance fixes.
28 — A dotted gray line illustrates the VNAV path from the FAF to the Landing Threshold Point (LTP) TCH. The VNAV path supports CDFA flight techniques between the FAF and MAP only. The VNAV path is NOT intended to be used below the DA/MDA. In accordance with FAA and ICAO regulations, descent below DA/MDA is strictly prohibited without visual reference to the runway environment.
29 — Visual flight track is shown when the missed approach point is prior to the runway threshold.

DESCENT/TIMING CONVERSION TABLE — LIGHTING BOX — MISSED APPROACH ICONS

Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	377	484	538	646	753	861
VDA	3.10°	384	494	548	658	768	878
FAF to MAP	6.3	5:24	4:12	3:47	3:09	2:42	2:22



1 — Indicates Ground Speed in Knots for several common aircraft approach speeds.
2 — For precision approaches, Glide Slope angle is shown in degrees along with relative descent rates in feet per minute.
3 — For non-precision approaches, Vertical Descent Angle is shown, when applicable, in degrees along with relative descent rates in feet per minute.
4 — The location of the Missed Approach Point is defined, the distance and associated timing is included only when applicable.
5 — Installed approach lights, visual approach slope indicators, and runway end identification lights (REIL) are depicted for the straight-in landing runway.
6 — Missed approach Icons which symbolize the initial “up and out” actions associated with the missed approach procedure are depicted. The complete missed approach instructions are shown in textual form in the Briefing Strip.

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APPROACH CHART LEGEND

LANDING MINIMUMS (Eff Jan 2020)

Publication of landing minimums does not constitute authority for their use by all operators. Each individual operator is responsible for ensuring that the proper minimums are used based on authorization specific to the type of operation.

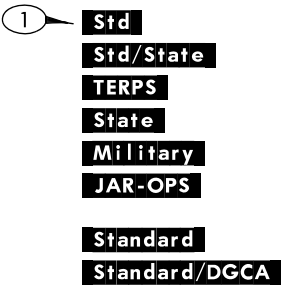
Landing minimums are supplied for all approach procedures and known approach conditions. When the Governing State Authority has not provided landing visibilities for a particular approach procedure, they will be derived by Jeppesen based on ICAO Doc 9365 Manual of All Weather Operations. For landing minimums rules and tables refer to AIR TRAFFIC CONTROL — Aerodrome Operating Minimums JEPPESEN.

A "Std" label in the upper left corner of the minimums box indicates that the published visibilities are ICAO Doc 9365 compliant. Other labels, as described below, indicate compliance with other regulations.

Visibilities that have been derived by Jeppesen for straight-in procedures are all RVR, State provided VIS or CMV values will be labeled as such. Visibilities for circling procedures are always VIS. Operators using these visibilities should be aware of this. If ATC does not report RVR, pilots have to convert the reported meteorological VIS into a CMV, to compare it against the charted RVR (refer to the table at the end of this section and to AIR TRAFFIC CONTROL — Aerodrome Operating Minimums JEPPESEN).

Visibility values are reported and thus depicted in the form of nautical/statute miles, feet, meters and kilometers.

1 — Minimums Label: Indicates that landing minimums are compliant with a specific regulation, but never below State published values.



Std – Minimums are based on tables and rules from ICAO Doc 9365 (Manual of All Weather Operations). No comparison has been done to any other landing minimums criteria.

Std/State – Minimums are based on tables and rules from a State Regulation which is similar/close to ICAO Doc 9365 (e.g. EASA AIR OPS, Indian CAR), refer also to AIR TRAFFIC CONTROL — Aerodrome Operating Minimums JEPPESEN for identified differences to ICAO Doc 9365. No comparison has been done to any other landing minimums criteria.

TERPS – Minimums are based on TERPS change 20 or later. U.S. OPSPEC requirement for non-CDFA penalty applies. No comparison has been done to any other landing minimums criteria.

State – Minimums are shown as supplied by the State (unknown rules and tables). State minimums may be supplemented by visibilities based on ICAO Doc 9365 for specific conditions (e.g. ALS out) or for procedures if visibilities are not provided by the State (e.g. ILS minimums State provided, LOC only minimums not State provided). Therefore, not all of the depicted visibilities are necessarily State provided values. No comparison has been done to any other landing minimums criteria.

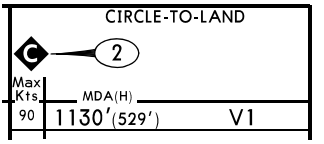
Military – Minimums are shown as supplied by a State Military. No comparison has been done to any other landing minimums criteria.

JAR-OPS – Minimums are based on tables and rules from JAR-OPS 1. No comparison has been done to any other landing minimums criteria.

No label indicates that the landing minimums are **not** yet converted to the new Jeppesen Standard AOM and are still based on ECOMS rules and tables (refer to www.jeppesen.com/aom).

A **Standard** or **Standard/DGCA** label indicates that the minimums are based on EASA AIR OPS, EU-OPS/CAR-OPS or Indian CAR, but are **not** yet converted to the new Jeppesen Standard AOM. During conversion to the new Standard AOM the new **Std/State** label and the new layout will be applied, the visibilities will remain unchanged. No comparison has been done to any other landing minimums criteria.

2 — Indicates that the published Circle-To-Land minimums are based on TERPS 8260.3B change 21 or later version. Expanded circling approach areas apply. For expanded circling approach area radii refer to AIR TRAFFIC CONTROL — United States — Rules and Procedures. The "C" is also depicted for circling minimums outside of the United States if applicable.



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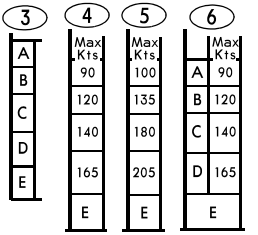
APPROACH CHART LEGEND



3 — Aircraft categories ABCD are normally shown. If indicated by source, the following categories could be shown in addition to categories ABCD or instead of categories ABCD:

- E (category E)
- H or COPTER (Helicopter only)
- HPMA (High Performance Military Aircraft)
- DL (Large Aircraft)

4 — TERPS **maximum** circling speeds.

5 — ICAO **maximum** circling speeds.

Note: Known deviations from the TERPS or ICAO maximum circling speeds will be shown. For countries that do not supply maximum circling speeds, aircraft approach categories will be shown.

6 — For Circle-To-Land only approaches, both the aircraft approach categories and the maximum circling speeds are shown just prior to the circling minimums.

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7 — Decision Altitude (Height) label, Decision Altitude and Decision Height for Precision approach and APV operations.
A charted DA(H) on Non-precision approaches which are converted to the new AOM Standard **(State** label) indicates that the DA(H) is published by the State, and only in this case a height loss might be incorporated by the State.

7 DA(H) **720'** (100')

Note: The difference between DA and DH normally reflects the threshold elevation, touchdown elevation or airport elevation. Some States provide rounded values for DA and DH. In such cases Jeppesen depicts the State values and the difference between DA and DH may not correspond to the reference datum.

8 — Minimum Descent Altitude (Height) label, Minimum Descent Altitude and Minimum Descent Height for Non-precision approach operations. The MDA(H) is shown for non-CDFA minimums or if the State has supplied an MDA(H) on the procedure source.

8 MDA(H) **720'** (339')

Note: The difference between MDA and MDH normally reflects the threshold elevation, touchdown elevation or airport elevation. Some States provide rounded values for MDA and MDH. In such cases Jeppesen depicts the State values and the difference between MDA and MDH may not correspond to the reference datum.

9 — DA/MDA(H) label is shown, when either Decision Altitude (Height) or Minimum Descent Altitude (Height) can be used on Non-precision approaches depending on operational approval. This label is normally associated with CDFA minimums.

9 DA/MDA(H) **720'** (251')

Note: Jeppesen charted DA/MDA(H) values do not include a height loss adjustment. Pilots have to check their operator's policy for the application of add-ons.

10 — Radio Altimeter height, associated with CAT II precision approaches. In some cases a specific Radio Altitude is supplied by the State as part of CAT III State minimums.

10 **RA 97'**
DA(H) **720'** (100')

11 — Nautical or Statute mile VIS are depicted in whole and fractions of a mile. No units label is shown. A specified visibility of "V3/4" means "3/4 mile", "V2 1/2" means "2 1/2 miles".

11 V3/4

12 — Equivalent Runway Visual Range (RVR) values associated with nautical/statute mile VIS represent readings in hundreds of feet, "R40" means RVR 4000ft. Equivalent RVR values are shown when supplied or authorized by the State, applicable to a specific approach procedure.

12 R40 or V3/4

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APPROACH CHART LEGEND

13 — Visibilities in meters are labeled with an “m” while values in kilometers are labeled with a “km”. There are only RVR values shown, except if a VIS is provided by the State. An RVR is labeled “R”, a VIS value is labeled “V”. An “R/V” label indicates that the charted value is either RVR or VIS.

(13) R550m V800m R/V1200m

14 — The particular condition is **Not Authorized**. If necessary it will be abbreviated by “NA”.

(14) NOT AUTHORIZED NA

15 — The particular condition does **not apply**.

(15) NOT APPLICABLE

16 — Indicates that a ceiling is required according to the State source as part of the overall landing minimums. Some States simply provide ceiling values as advisory information. Ceilings are shown as height above ground level in feet or meters depending on the unit used for reporting.

(16) CEILING REQUIRED

17 — When provided by source, ceilings are depicted prior to the associated visibility. Ceiling is always shown in smaller size in front of the RVR or VIS.

(17) 1000′-V2 105m-R2000m

State	(21) STRAIGHT-IN LANDING RWY					(23) 2 CIRCLE-TO-LAND	
	(18) ILS DA(H) 285′ (270′)		1 LOC (GS out) MDA(H) 390′ (375′)			(22) Not Authorized South of Airport	
(19)		ALS out		ALS out	Max Kts	MDA(H) (24)	
A	R600m	R1000m	R900m	R1500m	100	430′ (415′)	V1500m
B			R1000m		135	520′ (505′)	V1600m
C				R1800m	180	620′ (605′)	V2400m
D	R650m	R1200m	R1400m	R2000m	205	720′ (705′)	V3600m

1 Missed approach requires minmum climb of 305/NM to 4000′.
2 Circling heights based on rwy 24 thresh elev of 15′. (20)

18 — Type of approach is indicated when multiple types are shown in minimums box.

19 — Known conditions or requirements that affect the minimums are shown above the visibilities. This may include combinations of state specific components such as TDZ, CL, RAIL or simply ALS out. Columns stated as “ALS out” represent inoperative approach light components or visual aids impacting visibilities.

20 — Notes that only apply to the charted minimums are shown within the minimums box.

21 — Label for landing minimums, STRAIGHT-IN-LANDING, LANDING or SIDESTEP may be used. This represents the minimums for the runway/s associated to the procedure not the type of approach or alignment to final.

22 — Notes that apply to a given set of minimums are shown above the affected values.

23 — The set of minimums applicable when a circling maneuver is required are labeled as such.

24 — The MDA(H) label for circle-to-land minimum descent altitudes and the associated height is shown at the top of the column.

ICAO DOC 9365 **does not** require the add-on, therefore the visibilities in minimums boxes with the “Std” label are charted as provided in Table 6-3 (refer to AIR TRAFFIC CONTROL — Aerodrome Operating Minimums JEPPESEN).

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APPROACH CHART LEGEND

Labels used in conjunction with landing visibility values

R — An “R” label indicates that the associated value is an RVR.

When the State Authority has supplied landing visibilities, and has indicated that the value supplied is an RVR, the “R” label is applied.

Since all straight-in visibility values in ICAO Doc 9365 are in the form of an RVR, all values depicted when the State Authority has not supplied visibilities will be labeled with an “R”. This does not depend on the availability of RVR transmissometer. How these values are used is dependent on each individual operator’s regulations.

V — A “V” label indicates that the associated value is a metric or nautical/statute mile meteorological VIS. For straight-in procedures only VIS that have been supplied by the State Authority will be labeled with a “V”. Circling visibilities are always VIS and therefore labeled with a “V”.

R/V — An “R/V” label indicates that the associated value can be either an RVR or met VIS depending on what is reported by ATC. Only RVR/VIS values that have been supplied by the State Authority will be labeled with an “R/V”.

C — A “C” label indicates that the associated value is a converted meteorological visibility (CMV). A CMV is equivalent to an RVR and is derived from the meteorological visibility which is reported by ATC. Only CMV values that have been supplied by the State Authority will be labeled with a “C”.

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Guide for Visibility Label Usage

Charted Visibility Label	Reported by ATC	Probable Pilot action (Note 1)
R or **C**	RVR	Reported RVR is compared directly to the R or C value on the chart.
	Met VIS	Reported met VIS is converted into CMV and then compared to the R or C value on the chart. **(Note 2)**
V	RVR	RVR in ft needs to be converted to sm, then compared directly to the V value on the chart. A metric RVR is compared directly to the V value on the chart.
	Met VIS	Reported met VIS is compared directly to the V value on the chart.
R/V	RVR	Reported RVR is compared directly to the R value on the chart.
	Met VIS	Reported met VIS is compared directly to the V value on the chart.

Note 1: Refer to AIR TRAFFIC CONTROL — Aerodrome Operating Minimums JEPPESEN for conversion factors depending on available approach and runway lights during day and night.

Note 2: An operator must ensure that a conversion of a reported met VIS to RVR/CMV is not used for take-off, for calculating any other required RVR minimum less than 800m, or when a reported RVR is available.
Conversion of met VIS to RVR may depend on individual operator's regulations.

Depiction of Landing Minimums based on ECOMS tables and rules

Refer to www.jeppesen.com/aom

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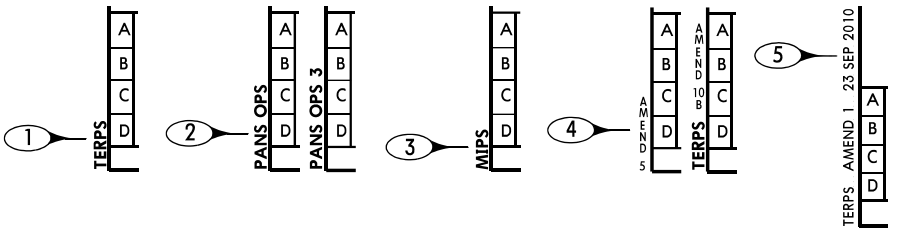
APPROACH CHART LEGEND

CHART BOUNDARY LINE INFORMATION



1 — Label indicates the State has specified that the approach procedure complies with the United States Standard for Terminal Procedures criteria as it relates to aircraft handling speeds and circling area development.

2 — Labels indicate the State has specified that the approach procedure complies with the ICAO PANS-OPS criteria as it relates to aircraft handling speeds and circling area development.

3 — Label indicates the MIPS design criteria when it is known that the procedure is designed according to Military Instrument Procedures Standardization, which is the short form for AATCP–1, NATO Supplement to ICAO Document 8168-0PS/611 Volume II.

4 — Shown when procedure source amendment information has been supplied by the State (USA).

5 — Currently only shown on U.S. approach procedures, the Procedure Amendment Reference Date is supplied on charts with an Effective Date later than 22 OCT 2009. This reference date is used to establish electronic database currency.

CHANGES: Airport and TDZ elevations, notes. © JEPPESEN, 1997, 2008. ALL RIGHTS RESERVED.

6 7

6— A brief summary of the changes applied to the chart during the last revision.

7 — Jeppesen Copyright label.

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APPROACH CHART LEGEND

APPROACH CHART DESIGN ENHANCEMENTS

Design enhancements will be added to Military Approach procedures initially.
You will also see them on civilian and mixed use procedures in the future.

UHF Communications

ATIS	NEW ORLEANS Approach (R)		NAVY NEW ORLEANS Tower		Ground	
279.55	123.85	256.9	123.8	340.2	121.6	270.35

Navaid Symbols

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Type	TACAN	VORTAC	VOR DME	VOR	DME	NDB
Non Compulsory						
Compulsory						

Navaid Boxes

	TACAN procedure based on VORTAC or TACAN Navaid	VOR DME or TACAN ; VOR or TACAN procedure based on VORTAC Navaid	VOR DME procedure based on VORTAC or VOR DME Navaid	ILS DME ; LOC DME procedure
Navaid Box	(XXX.XX) XXXX D (H) CH XXX XXX	XXXX D (L) XXX.X XXX CH XXX	(CH XXX) XXXX D XXX.X XXX	(CH XXX) XXX XXX XXX° XXX.X IXXX

(Navaid boxes are not shadowed if they do not provide course guidance on final)

Crossing Altitudes in the Chart Planview

10000 FL100
8000 FL80

8000 FL80

10000 FL100

8000 FL80

8000 FL80

Speed Restrictions in the Chart Planview

MAX 250 KT
MIN 210 KT
AT 230 KT

Between
260 - 280 KT

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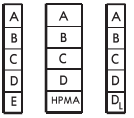
APPROACH CHART LEGEND

Speed Restrictions in the Chart Planview

Speed Depiction
MIN 210 KT
MAX 250 KT
MANDATORY 230 KT
AT 230 KT
Between 260 - 280 KT

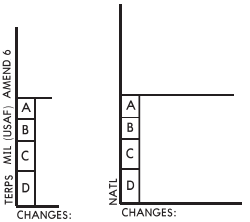
Minimums

Cat E, HPMA, and D_L



Instrument Procedure Design Indicator

Additionally, if the procedure AIP indicates the procedure design was based on mixed criteria, TERPs and PANS OPS, the chart would indicate a NATL label.



OPR (Office of Primary Responsibility) Label

An OPR label will be included on *all* military procedure charts:

MIL (USAF) — procedures designed by the United States Air Force
MIL (USN) — procedures designed by the United States Navy
MIL (USA) — procedures designed by the United States Army
MIL — any procedure based on a Host Nation military AIP

Note: If a procedure does not include an OPR label, the Host Nation Civil Authority publication was used.

END OF APPROACH CHART LEGEND

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CHART LEGEND - EASA AIR OPS AERODROME OPERATING MINIMUMS (AOM) - EFFECTIVE 30 OCTOBER 2022

The publication of EASA Air Ops landing and take-off minimums on Jeppesen charts does not constitute authority for their use by every operator. Each individual operator is responsible for validating that the appropriate approval has been obtained for their use.

GENERAL

On 5 October 2012 the Commission Regulation (EU) No 965/2012 and related documents were published, laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.

The European Aviation Safety Agency (EASA) publishes Regulations on Air Operations with the associated Decisions containing Acceptable Means of Compliance (AMC) and Guidance Material (GM).

On JEPPESEN approach and airport charts an inverse printed **"Standard"** label in the upper left corner of the minimums band indicates that the minimums are derived according to the requirements described in EASA Air Operations documents.

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From 2020 the**"Standard"** label will be replaced by a **"Std/State"** label to be aligned with the new Jeppesen Standard AOM policy. The label indicates that the minimums are determined according to a State Regulation, which is, in general, similar to the guidance from ICAO Doc 9365.

EASA AIR OPS minimums may be published on minimums listings (indexed as 10-9S, 10-9S1,...) if requested by an operator. As the pages are created especially for EASA AIR OPS operators, an inversely printed "EASA AIR OPS" label is depicted in the upper right corner of this page.

For a detailed excerpt of **latest** EASA AIR OPS minimums refer to Jeppesen ATC-Chapter "AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS - Effective 30 October 2022" and "HELICOPTER AERODROME OPERATING MINIMUMS – EASA AIR OPS OPERATIONS".

Jeppesen charted minimums are not below any State-provided minimums. RVR/CMV/VIS values are shown in measuring units as reported by the governing agency.

AOM for take-off and landing are either shown on Jeppesen instrument approach or airport charts or on a separate minimums listing.

Straight-in landing minimums will be shown as RVR with prefix "R", as provided within the EASA tables. A Visibility, prefixed "V", will only be charted if a VIS value is published as State minimum. The prefix "VIS" may still be used on older charts.

A Converted Meteorological Visibility, prefixed "C", will only be charted if a CMV value is published as State minimum. The prefix "CMV" may still be used on older charts.

Circling minimums are always visibilities and depicted with prefix "V".

Take-off minimums are shown as RVR "R", as VIS "V" or as RVR/VIS "R/V". Values which could be either RVR or VIS may be depicted without any prefix on older charts.

A Visibility, prefixed "V", will only be charted for take-off if a VIS value is published as State minimum.

For separate minimums listings (like 10-9S pages) RVR, CMV and VIS are always abbreviated as "R", "C" and "V".

NOTE: Most of the samples in this document are intended to illustrate only the relevant information of the related paragraph. Other sections (like circling minimums) within the samples are intentionally left blank.

TAKE-OFF MINIMUMS

According to AMC2 SPA.LVO.105(c)(b)(7)(ii) low visibility procedures (LVP) are required for LVTO with RVR less than 400m.

Operators need an approval to conduct low visibility take-off operations with an RVR below 400m. Night operations always require runway end lights (RENL). This is not indicated in the take-off minimums box as all runways which are equipped with RL are required to have runway end lights per ICAO Annex 14.

Jeppesen depicts the lowest possible take-off minimums (including Low Visibility Take-off minimums) based on the best runway lighting (RL, TDZ, CL) as the information about LVP is not always available in the AIP. The take-off minimums box does not differentiate between the specific runways unless there are State provided values available which do not depend on the availability of runway lights.

Pilots have to select the lowest RVR for take-off depending on the active runway lighting of the take-off runway.

Jeppesen depicts a take-off RVR of 75m only if the runway is approved for CAT III operations with RVR 75m (no restrictions).

Take-off minimums below 400m are depicted as RVR. This is independent of the availability of transmissometers because the pilot can determine the RVR at the beginning of the take-off roll by counting visible lamps of RL or TDZ.

Only if there is a clear statement within the AIP that LVP are not available for the specific airport, the take-off minimum will be "R400m" or the State provided minimum (e.g. R550m or R550m/V800m).

According to AMC1 SPA.LVO.100(a)(c), the minimum RVR should be achieved for all reporting points representative of the parts of the runway from the point at which the aircraft commences the take-off until the calculated accelerate-stop distance from that point.

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CHART LEGEND - EASA AIR OPS AERODROME OPERATING MINIMUMS (AOM) - EFFECTIVE 30 OCTOBER 2022

Std/State	TAKE-OFF						
Low Visibility Procedures required				RCLM or RL or CL	RL or CL	Adequate Vis Ref	
Approval for Low Visibility Take-off required							
RCLM & RL & CL (spacing 15m or less) & RVR	RCLM & RL & CL & RVR	RCLM & RL & RVR	RCLM & RVR & RL or CL				
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
1 R125m	R150m	R300m		R/V400m		R/V500m	NA
1 RWY xx: R75m with approved lateral guidance system.							

CIRCLING MINIMUMS

Circling minimums are only shown if a circling OCA(H), MDA(H) or circling minimums are provided by the procedure source. Otherwise, the circling box is removed. If circling is not authorized by the procedure source, it will be noted in the Briefing Strip header. Where straight-in minimums are higher than circling minimums (DH/MDH or RVR/VIS), a note is added to remind the pilot that the higher straight-in minimums have to be used.

CIRCLE-TO-LAND		
Max Kts	MDA(H)	
100	690′(575′)	V1500m
135	690′(575′)	V1600m
180	870′(755′)	V2400m
205	870′(755′)	V3600m

NON-PRECISION APPROACH MINIMUMS AND CHART PROFILE VIEW

According to the EASA AIR OPS CAT.OP.MPA.115(b)(1) requirement for Commercial Air Transport Operations (Part CAT), non-precision approaches shall be flown using the continuous descent final approach (CDFA) technique. Not applying the CDFA technique may result into higher minimums.

The lowest non-precision approach minimums (R550m or R750m) depend on type of operation, two dimensional (2D) or three-dimensional (3D). In both cases, a CDFA label in the minimums box and a “DA/MDA(H)” will be depicted.

This label is intended to remind pilots to use the MDA(H) to determine the VNAV DA(H). Jeppesen does not depict it as DA(H) as operators may have to apply different methods to determine VNAV DA(H) according to State regulations.

If a descent angle is depicted in the profile view, the minimums are based on the rules for 3D operations. Without a descent angle in the profile view, or with an “MDA(H)” label in the minimums box the minimums are based on the rules for 2D operations.

The NPA minimums for CDFA 2D and CDFA 3D are identical for DH/MDH above 320’. The higher CDFA 2D RVR of 750m for DH/MDH at or below 320’ will be indicated by a note at the bottom of the minimums box.

There will be no CDFA label if the minimums are based on a different flight technique. On older charts this is indicated by a “non-CDFA” label.

A “non-CDFA” label will only be depicted if this condition is provided by source. The add-on of 200m (CAT A & B) or 400m (CAT C & D) is only incorporated if there is the “non-CDFA” label depicted in the minimums box. In all other cases the add-on is not included.

Approach Type	Flight Technique	Descent Limit Label	Type of Operation
Non-precision	CDFA *(onboard equipment)* Descent angle depicted in profile view	DA/MDA(H)	3D, type A
Non-precision	CDFA *(manual calculation)* No Descent angle depicted in profile view	DA/MDA(H) or MDA(H)	2D, type A
Non-precision	Other than CDFA	MDA(H)	2D, type A
Non-precision	Non-CDFA *(per source or on older charts)*	MDA(H)	2D, type A

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CHART LEGEND - EASA AIR OPS AERODROME OPERATING MINIMUMS (AOM) - EFFECTIVE 30 OCTOBER 2022

Sample of Non-precision Minimums (CDFA, 3D, FALS+TDZ+CL)

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Std/State	STRAIGHT-IN LANDING		
	XXX CDFA 1 DA/MDA(H) XXX'(xxx')		
		TDZ or CL out	ALS out
A B C D	3 Rxxxm	2 3 Rxxxm	Rxxxm

1 VNAV DA(H) in lieu of MDA(H) depends on operator policy.
2 R750m when a Flight Director or Autopilot or HUDLS to DA is not used.
3 R750m for CDFA 2D operations.

The note "R750m when a Flight Director or Autopilot or HUDLS to DA is not used." indicates that the use of flight director or autopilot or HUDLS is required if TDZ and/or CL are not available. Otherwise the RVR is 750m. The note "R750m for CDFA 2D operations." indicates the RVR is 750m if the type of operation is 2D (CDFA with manual calculation of the required rate of descent). The "VNAV DA(H)…" note is a reminder to determine the VNAV DA(H) from MDA(H) according to the operator specific requirements.

Sample of Non-precision Minimums (CDFA, 2D)

Std/State	STRAIGHT-IN LANDING	
	XXX CDFA 1 DA/MDA(H) XXX'(xxx')	
		ALS out
A B C D	Rxxxm	Rxxxm

1 VNAV DA(H) in lieu of MDA(H) depends on operator policy.

The "VNAV DA(H)…" note is a reminder to determine the VNAV DA(H) from MDA(H) according to the operator specific requirements.

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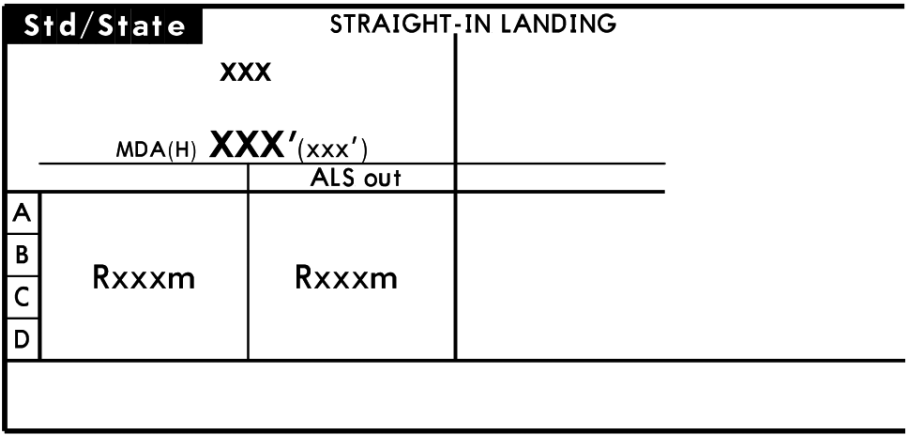
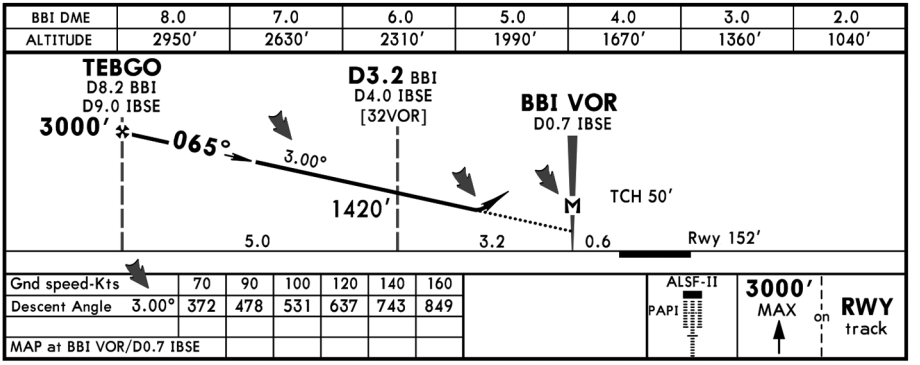
CHART LEGEND - EASA AIR OPS AERODROME OPERATING MINIMUMS (AOM) - EFFECTIVE 30 OCTOBER 2022

Sample of Non-precision Minimums (other than CDFA, 2D)



The profile depiction is modified to show the continuous descent track on final approach. Source published minimum altitudes are shown as segment minimum altitudes in the profile (grey shaded box). These minimum altitudes are typically provided for obstacle clearance and must not be violated to remain clear of obstacles or terrain. If not published by the procedure source, a table depicting distance vs altitude or DME vs altitude information will be calculated by Jeppesen and shown above the profile view.

The missed approach pull-up arrow is shown at the point where the decision height is reached (not to scale). There is no level segment depicted prior to the MAP, the MAP symbol “M” is shown at the same position as published by the procedure source.



In exceptional cases it may be necessary to include both, CDFA and non-CDFA/other than CDFA flight path. In this case, a level segment is shown prior to the missed approach point and the pull-up arrow is shown at the MAP to depict the non-CDFA/other than CDFA procedure.

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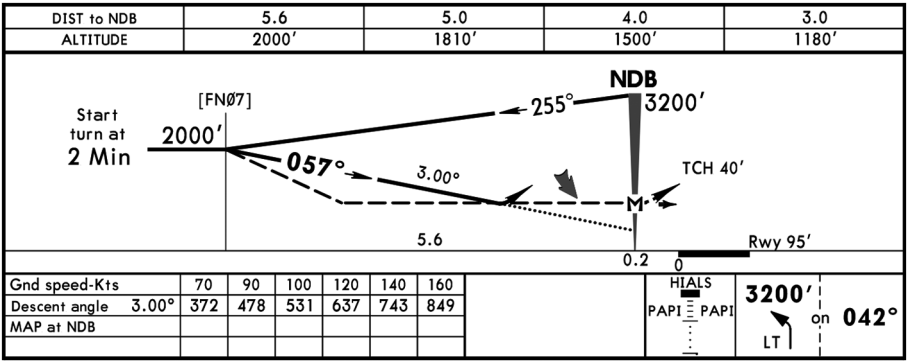
CHART LEGEND - EASA AIR OPS AERODROME OPERATING MINIMUMS (AOM) - EFFECTIVE 30 OCTOBER 2022

CDFA 3D together with non-CDFA/other than CDFA



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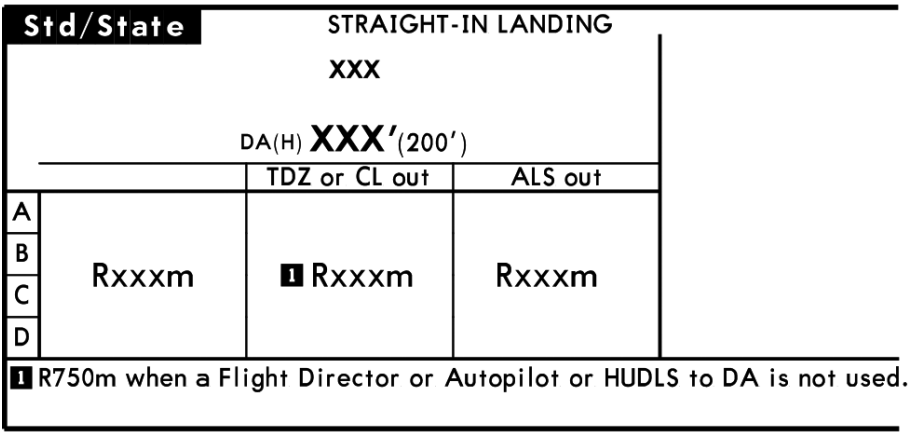
CAT I PRECISION APPROACH AND APV MINIMUMS

The minimums for CAT I Precision approaches and for APV are determined according to the rules for 3D operations and depend on available approach and runway lighting.

CAT I (ILS, GLS, PAR, LPV) or APV (LPV, LNAV/VNAV) with FALS+TDZ+CL



The note “R750m when a Flight Director or Autopilot or HUDLS to DA is not used.” indicates that the use of flight director or autopilot or HUDLS is required if TDZ and/or CL are not available. Otherwise the RVR is 750m.

“LPV (VAL 35m)” is only depicted if required according to the FAS datablock of the related LPV procedure (type A or B). The first column depicts the minimums with all approach and runway lights operating. The term “FULL” will no longer be used on ILS procedures and will be removed.

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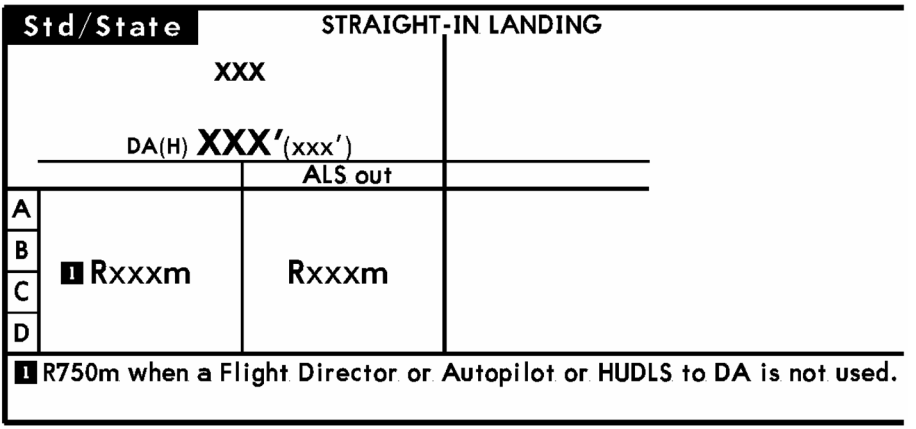
CHART LEGEND - EASA AIR OPS AERODROME OPERATING MINIMUMS (AOM) - EFFECTIVE 30 OCTOBER 2022

CAT I (ILS, GLS, PAR, LPV) or APV (LPV, LNAV/VNAV) without TDZ and/or CL



The note "R750m when a Flight Director or Autopilot or HUDLS to DA is not used." indicates that the use of flight director or autopilot or HUDLS is required. Otherwise the RVR is 750m.

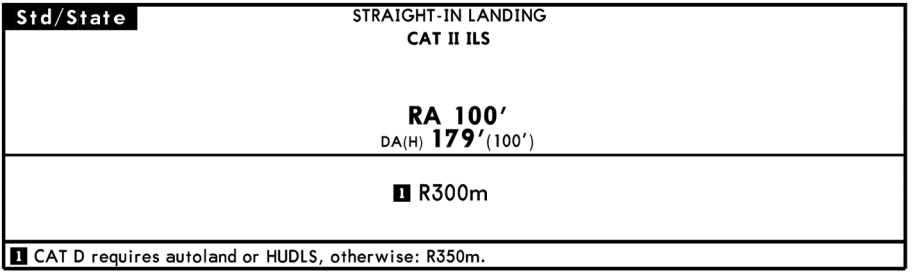
CAT II PRECISION APPROACH MINIMUMS

CAT II minimums will be provided if a CAT II instrument approach procedure source is officially published by the State.

The radio altitude (RA) is based on the decision height and takes the underlying terrain into account. The RVR is based on the decision height. The RVR 350m for CAT D aircraft not using autoland and not using HUDLS is depicted as note unless the required RVR is already higher than 350m.

If not source provided, the RA will be determined according to the data on the Precision Approach Terrain Chart (PATC). If a PATC is not available, the RA cannot be charted and a note will indicate this situation.

The operator is responsible to provide guidance to the pilots on how the RA has to be substituted (refer to GM10 SPA.LVO.110).



CAT III PRECISION APPROACH MINIMUMS

CAT III minimums will be provided if a CAT III instrument approach procedure source is officially published by the State.

Only the lowest CAT III RVR of 75m is depicted because EASA does no longer refer to CAT IIIA and CAT IIIB. The pilots have to compare the RVR which they are approved for against the RVR in the minimums box and have to use the higher of both.

A decision height (or RA) will only be depicted if it is required by the State source. The pilots have to use the DH which they are approved for unless they are approved to operate with no DH.

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CHART LEGEND - EASA AIR OPS AERODROME OPERATING MINIMUMS (AOM) - EFFECTIVE 30 OCTOBER 2022

Std/State	STRAIGHT-IN LANDING	
	CAT III ILS	
	R75m	

If the State source still differentiates between CAT IIIA and CAT IIIB, the minimums box will depict CAT IIIA and CAT IIIB minimums. Eff 30 October 2022, the lowest minimums values for CAT IIIA are RVR 175m and DH 50'. These are the same values as for "CAT III" without a roll-out control/guidance system.

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Std/State	STRAIGHT-IN LANDING	
CAT IIIB ILS	CAT IIIA ILS DH 50'	
R75m	R175m	

SPECIAL AUTHORIZATION CAT I (SA CAT I) MINIMUMS

SA CAT I minimums will only be provided on request for approved operators unless an SA CAT I instrument approach procedure source is officially published by the State.

The depiction of minimums depends on operator requirements and guidance. A decision height below 200' requires the use of a radio altimeter or other device capable of providing equivalent performance. Source providers normally do not publish a precision approach terrain chart (PATC) for a CAT I precision approach runway, but a PATC would be needed to determine the radio altitude (RA).

SPECIAL AUTHORIZATION CAT II (SA CAT II) MINIMUMS

SA CAT II minimums will only be provided on request for approved operators unless an SA CAT II instrument approach procedure source is officially published by the State.

It is expected that the current Other Than Standard CAT II procedures will be converted into SA CAT II by the source provider.

The radio altitude (RA) is based on the decision height and takes the underlying terrain into account. The RVR depends on the decision height.

Std/State	STRAIGHT-IN LANDING
	SA CAT II ILS RA 112' DA(H) 1293' (100')
	1 R350m
1 R400m if CL out.	

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CHART LEGEND - EASA AIR OPS AERODROME OPERATING MINIMUMS (AOM) - EFFECTIVE 30 OCTOBER 2022

PLANNING MINIMUMS

Planning minimums will not be depicted on Jeppesen Standard charts. Planning minimums can be provided on request and require guidance from the requesting operator.

MINIMUMS LISTING (10-9S)

On customer request, the EASA AIR OPS minimums can be made available for airports outside of the EASA AIR OPS application area on a minimums listing page.

The listings are indexed as 10-9S/10-9S1, 20-9S/20-9S1, etc.

The pages depict the descent limit and visibilities for every procedure. The minimums are determined according to the EASA AIR OPS rules and take State provided values into account.

Because of applying different rules to determine aerodrome operating minimums, the minimums on 10-9S pages might be equal to, higher or lower than the minimums on Jeppesen Standard Airport or Instrument Approach Procedure charts.

TERPS change 20 was harmonized with the EASA minimum tables for CAT I, APV and NPA (CAT C and D aircraft only). Those procedures with the TERPS label on the approach procedure chart are therefore EASA AIR OPS compliant because the minimums are not lower than EASA AIR OPS minimums and a 10-9S page is normally not required.

For non-precision approaches with a TERPS label on the approach procedure chart, CAT A or B aircraft operators should compare the charted CAT A or B minimums against the charted CAT C minimums. By selecting the higher of both, the operator meets the TERPS and the EASA AIR OPS minimum RVR and VIS values.

DEPICTION OF EASA AIR OPS AOM IN CASE OF EXISTING STATE MINIMUMS

If State minimums are officially published, the depiction of AOM may differ from the standard depiction. The RVR or VIS values which are reported by ATC have to be equal to or higher than the RVR or VIS values which are depicted in the minimums box.

a. If RVR and VIS are charted together, the RVR value is compulsory. If RVR is not reported by ATC, the reported VIS has to be used. Conversion of reported VIS into CMV is not allowed. (e.g. R550m V800m, old format: RVR 550m VIS 800m)
b. The “R/V” prefix is used if RVR and VIS is identical. The reported RVR is compulsory. If RVR is not reported by ATC, the reported VIS has to be used. Conversion of reported VIS into CMV is not allowed. (e.g. R/V1200m, old format: 1200m)
c. If only VIS is charted, the reported VIS has to be used. (e.g. V2500m, old format: 2500m)
d. If CMV is charted, the pilot converts a reported VIS and compare this value against the charted CMV. (e.g. C2500m, old format: CMV 2500m)

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS

General and Aeroplane Specific Material (2016)

1 GENERAL

On 5 October 2012 the Commission Regulation (EU) No 965/2012 and related documents were published, laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.

The European Aviation Safety Agency (EASA) publishes Regulations on Air Operations with the associated Decisions containing Acceptable Means of Compliance (AMC) and Guidance Material (GM).

On JEPPESEN approach and aerodrome charts an inverse printed **"Standard"** label in the upper left corner of the minimums band indicates that the minimums are derived according to the requirements described in EASA Air Operations documents.

46 TERPS change 20 was harmonized with the EASA minimum tables for CAT I, APV and NPA (CAT C and D aircraft only). Those procedures with the TERPS label are therefore EASA AIR OPS compliant for CAT C and D aircraft operators.

The following explanation is an excerpt to summarize only the relevant parts of the EASA Air Operations (EASA Air OPS) regarding the methods used to determine Aerodrome Operating Minimums (Rules, AMC or GM). It is not intended to provide all the requirements of the EASA Air OPS related documents.

The publication of EASA Air Operations landing and take-off minimums on Jeppesen charts does not constitute authority for their use by every operator. Each individual operator is responsible for validating that the appropriate approval has been obtained for their use.

In addition, the minimums are only considered applicable if:

– the required ground equipment for the intended procedure is operative; and
– the required aircraft systems for the type of approach are operative; and
– the required aircraft performance criteria are met; and
– the crew is qualified accordingly.

2 TERMINOLOGY

Acceptable Means of Compliance (AMC) — means non-binding standards adopted by the Agency to illustrate means to establish compliance with Regulation (EC) No 216/2008 and its Implementing Rules.

CAT.OP.MPA.xxx — Implementing rule (IR) from regulation for PART-CAT (Commercial Air Transport Operations)

SPA.LVO.xxx — Implementing rule from regulation for PART-SPA (Specific Approvals)

AMC1 CAT.OP.MPA.115 — Acceptable Means of Compliance to the related IR CAT.OP.MPA.115

GM1 CAT.OP.MPA.110 — Guidance Material to the related IR CAT.OP.MPA.110

3 OPERATORS RESPONSIBILITY

CAT.OP.MPA.110 Aerodrome operating minimums

a. An operator shall establish aerodrome operating minimums for each departure, destination or alternate aerodrome planned to be used. These minimums shall not be lower than those established for such aerodromes by the State in which the aerodrome is located, except when specifically approved by that State. Any increment specified by the competent authority shall be added to the minimums.
b. The use of a head-up display (HUD), head-up guidance landing system (HUDLS) or enhanced vision system (EVS) may allow operations with lower visibilities than the established aerodrome operating minimums if approved in accordance with SPA.LVO.
c. When establishing aerodrome operating minimums, the operator shall take the following into account:
    1. the type, performance and handling characteristics of the aircraft;
    2. the composition, competence and experience of the flight crew;
    3. the dimensions and characteristics of the runways/final approach and take-off areas (FATO) that may be selected for use;
    4. the adequacy and performance of the available visual and non-visual ground aids;
    5. the equipment available on the aircraft for navigation and/or control of the flight path during the take-off, the approach, the flare, the landing, the roll-out and the missed approach;
    6. for the determination of obstacle clearance, the obstacles in the approach, missed approach and the climb-out areas necessary for the execution of the contingency procedures;
    7. the obstacle clearance altitude/height for the instrument approach procedure;
    8. the means to determine and report meteorological conditions; and
    9. the flight technique to be used during the final approach.
d. The operator shall specify the method of determining aerodrome operating minimums in the operations manual.
e. The minimums for a specific approach and landing procedure shall only be used if all the following conditions are met:
    1. the ground equipment shown on the chart required for the intended procedure is operative;
    2. the aircraft systems required for the type of approach are operative;
    3. the required aircraft performance criteria are met; and
    4. the crew is appropriately qualified.

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GM1 CAT.OP.MPA.110(a) Aerodrome operating minimums

INCREMENTS SPECIFIED BY THE COMPETENT AUTHORITY

Additional increments to the published minimums may be specified by the competent authority to take into account certain operations, such as downwind approaches and single-pilot operations.

4 LOW VISIBILITY OPERATIONS

SPA.LVO.100 Low visibility operations

The operator shall only conduct the following low visibility operations (LVO) when approved by the competent authority:

a. low visibility take-off (LVTO) operation;
b. lower than standard category I (LTS CAT I) operation;
c. standard category II (Cat II) operation;
d. other than standard category II (OTS CAT II) operation;
e. standard category III (CAT III) operation;
f. approach operation utilising enhanced vision systems (EVS) for which an operational credit is applied to reduce the runway visual range (RVR) minimums by no more than one third of the published RVR.

SPA.LVO.115 Aerodrome related requirements

a. The operator shall not use an aerodrome for LVOs below a visibility of 800m unless:
    1. the aerodrome has been approved for such operations by the State of the aerodrome; and
    2. low visibility procedures (LVP) have been established.
b. If the operator selects an aerodrome where the term LVP is not used, the operator shall ensure that there are equivalent procedures that adhere to the requirements of LVP at the aerodrome. This situation shall be clearly noted in the operations manual or procedures manual including guidance to the flight crew on how to determine that the equivalent LVP are in effect.

5 APPROACH FLIGHT TECHNIQUE

CAT.OP.MPA.115 Approach flight technique - aeroplanes

a. All approaches shall be flown as stabilised approaches unless otherwise approved by the competent authority for a particular approach to a particular runway.
b. Non-precision approaches:
    1. The continuous descent final approach (CDFA) technique shall be used for all non-precision approaches.
    2. Nothwithstanding 1., another approach flight technique may be used for a particular approach/runway combination if approved by the competent authority. In such cases, the applicable minimum runway visual range (RVR):
        i. shall be increased by 200m for category A and B aeroplanes and by 400m for category C and D aeroplanes; or
        ii. for aerodromes where there is a public interest to maintain current operations and the CDFA technique cannot be applied, shall be established and regularly reviewed by the competent authority taking into account the operator's experience, training programme and flight crew qualification.

AMC1 CAT.OP.MPA.115 Approach flight technique - aeroplanes

CONTINUOUS DESCENT FINAL APPROACH (CDFA)

a. Flight techniques:
    1. The CDFA technique should ensure that an approach can be flown on the desired vertical path and track in a stabilized manner, without significant vertical path changes during the final approach segment descent to the runway. This technique applies to an approach with no vertical guidance and controls the descent path until the DA/H. This descent path can be either:
        i. a recommended descent rate, based on estimated ground speed;
        ii. a descent path depicted on the approach chart; or
        iii. a descent path coded in the flight management system in accordance with the approach chart descent path.
    2. The operator should either provide charts which depict the appropriate cross check altitudes/heights with the corresponding appropriate range information, or such information should be calculated and provided to the flight crew in an appropriate and usable format. Generally, the MAPt is published on the chart.
    4. The required descent path should be flown to the DA/H, observing any step-down crossing altitudes if applicable.
    5. This DA/H should take into account any add-on to the published minimums as identified by the operator's management system and should be specified in the OM (aerodrome operating minimums).
    7. The operator should establish a procedure to ensure that an appropriate callout is made when the aeroplane is approaching DA/H. If the required visual references are not established at DA/H, the missed approach procedure is to be executed promptly.
    9. The missed approach should be initiated no later than reaching the MAPt or at the DA/H, whichever comes first. The lat-

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eral part of the missed approach should be flown via the MAPt unless otherwise stated on the approach chart.

AMC2 CAT.OP.MPA.115 Approach flight technique - aeroplanes

NPA OPERATIONS WITHOUT APPLYING THE CDFA TECHNIQUE

a. In case the CDFA technique is not used, the approach should be flown to an altitude/height at or above the MDA/H where a level flight segment at or above MDA/H may be flown to the MAPt.

e. The procedures that are flown with level flight at/or above MDA/H should be listed in the OM.

6 MET VISIBILITY/RVR/CMV

CAT.OP.MPA.305 - Commencement and continuation of approach

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c. Where the RVR is not available, RVR values may be derived by converting the reported visibility.

AMC10 CAT.OP.MPA.110 Aerodrome operating minimums

CONVERSION OF REPORTED METEOROLOGICAL VISIBILITY TO RVR

a. A conversion from meteorological visibility to RVR/CMV should not be used:
   1. when reported RVR is available;
   2. for calculating take-off minimums; and
   3. for any RVR minimums less than 800m.

b. If the RVR is reported as being above the maximum value assessed by the aerodrome operator, e.g. “RVR more than 1500m”, it should not be considered as a reported value for a.1.

c. When converting meteorological visibility to RVR in circumstances other than those in a., the conversion factors specified in Table 8 should be used.

AMC10 CAT.OP.MPA.110 Table 8 Conversion of reported MET VIS to CMV

Light Elements in Operation	CMV = Reported Meteorological Visibility x Conversion Factor	
	Day	Night
High intensity approach and runway lights	1.5	2.0
Any type of light installation other than above	1.0	1.5
No lights	1.0	Not applicable

7 APPROACH LIGHT SYSTEMS

AMC5 CAT.OP.MPA.110 Aerodrome operating minimums

APPROACH LIGHTING SYSTEMS

AMC5 CAT.OP.MPA.110 Table 4 Approach Lighting Systems

Class of Lighting Facilities	Length, Configuration and Intensity of Approach Lights
FALS	CAT I approach lighting system (HIALS ≥ 720m) distance coded centerline, Barrette centerline
IALS	Simple approach lighting system (HIALS 420-719m) single source, Barrette
BALS	Any other approach lighting system (HIALS or MIALS or ALS 210-419m)
NALS	Any other approach lighting system (HIALS, MIALS or ALS < 210m) or no approach lights

8 DETERMINATION OF AOM FOR TAKE-OFF

AMC1 CAT.OP.MPA.110 Aerodrome operating minimums

TAKE-OFF OPERATIONS - AEROPLANES

a. General
   1. Take-off minimums should be expressed as visibility or runway visual range (RVR) limits, taking into account all relevant factors for each aerodrome planned to be used and aircraft characteristics. Where there is a specific need to see and avoid obstacles on departure and/or for a forced landing, additional conditions, e.g. ceiling, should be specified.
   2. The commander should not commence take-off unless the weather conditions at the aerodrome of departure are equal to or better than the applicable minimums for landing at that aerodrome unless a weather-permissible take-off alternate aerodrome is available.
   3. When the reported meteorological visibility (VIS) is below that required for take-off and RVR is not reported, a take-off should only be commenced if the commander can determine that the visibility along the take-off runway is equal to or better than the required minimum.
   4. When no reported meteorological visibility or RVR is available, a take-off should only be commenced if the commander can determine that the visibility along the take-off runway is equal to or better than the required minimum.

VISUAL REFERENCE

AMC1 CAT.OP.MPA.110 Aerodrome operating minimums

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS

TAKE-OFF OPERATIONS - AEROPLANES

b. Visual Reference

1. The take-off minimums should be selected to ensure sufficient guidance to control the aircraft in the event of both a rejected take-off in adverse circumstances and a continued take-off after failure of the critical engine.
2. For night operations, ground lights should be available to illuminate the runway and any obstacles.

REQUIRED RVR/VIS

AMC1 CAT.OP.MPA.110 Aerodrome operating minimums

TAKE-OFF OPERATIONS - AEROPLANES

c. Required RVR/VIS - aeroplane

1. For multi-engined aeroplanes, with performance such that in the event of a critical engine failure at any point during take-off the aeroplane can either stop or continue that take-off to a height of 1500ft above the aerodrome while clearing obstacles by the required margins, the take-off minimums specified by the operator should be expressed as RVR/VIS values not lower than those specified in Table 1.A.
2. For multi-engined aeroplanes without the performance to comply with the conditions in c.1. in the event of a critical engine failure, there may be a need to re-land immediately and to see and avoid obstacles in the take-off area. Such aeroplanes may be operated to the following take-off minimums provided they are able to comply with the applicable obstacle clearance criteria, assuming engine failure at the height specified. The take-off minimums specified by the operator should be based upon the height from which the one-engine-inoperative (OEI) net take-off flight path can be constructed. The RVR minimums used should not be lower than either of the values specified in Table 1.A or Table 2.A.

AMC1 CAT.OP.MPA.110 Table 1.A Take-off RVR/VIS - Aeroplanes (without an Approval for Low Visibility Take-off)

Facilities		RVR/VIS
Day only	NIL	500m
Day	at least runway edge lights or centerline marking	400m
Night	at least runway edge lights and runway end lights or runway centerline lights and runway end lights	

The reported RVR/VIS value representative of the initial part of the take-off run can be replaced by the pilot assessment.

During day with Nil facilities: The pilot is able to continuously identify the take-off surface and maintain directional control.

AMC1 CAT.OP.MPA.110 Table 2.A Take-off - Aeroplanes Assumed Engine Failure Height above the Runway versus RVR/VIS

Assumed Engine Failure Height above the Take-off Runway	RVR/VIS
≤ 50ft	400m (200m with LVTO approval)
51ft-100ft	400m (300m with LVTO approval)
101ft-150ft	400m
151ft-200ft	500m
201ft-300ft	1000m
More than 300ft	1500m

1500m is also applicable if no positive take-off flight path can be constructed.

The reported RVR/VIS value representative of the initial part of the take-off run can be replaced by pilot assessment.

AMC1 SPA.LVO.100 Low visibility operations

LVTO OPERATIONS - AEROPLANES

For a low visibility take-off (LVTO) with an aeroplane the following provisions should apply:

a. for an LVTO with a runway visual range (RVR) below 400m the criteria specified in Table 1.A below;
b. for an LVTO with an RVR below 150m but not less than 125m:
   1. high intensity runway centerline lights spaced 15m or less apart and high intensity edge lights spaced 60m or less apart that are in operation;
   2. a 90m visual segment that is available from the flight crew compartment at the start of the take-off run; and
   3. the required RVR value is achieved for all of the relevant RVR reporting points;
c. for an LVTO with an RVR below 125m but not less than 75m:
   1. runway protection and facilities equivalent to CAT III landing operations are available; and
   2. the aircraft is equipped with an approved lateral guidance system.

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS

AMC1 SPA.LVO.100 Table 1.A LVTO - Aeroplanes

Facilities	RVR
Day: runway edge lights and runway centerline markings	300m
Night: runway edge lights and runway end lights or runway centerline lights and runway end lights	
Runway edge lights and runway centerline lights	200m
Runway edge lights and runway centerline lights and relevant RVR	TDZ, MID, rollout 150m
High intensity runway centerline lights spaced 15m or less and high intensity edge lights spaced 60m or less are in operation	TDZ, MID, rollout 125m
Runway protection and facilities equivalent to CAT III landing operations are available **and** the aircraft is equipped either with an approved lateral guidance system or an approved HUD/HUDLS for take-off	TDZ, MID, rollout 75m

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The reported RVR value representative of the initial part of the take-off run can be replaced by pilot assessment.

The RVR values are valid for multi-engined aeroplanes that in the event of an engine failure at any point during take-off can either stop or continue the take-off to a height of 1500ft above the aerodrome while clearing obstacles by the required margin.

The required RVR value to be achieved for all relevant RVRs.

9 DETERMINATION OF AOM FOR CIRCLING

AMC7 CAT.OP.MPA.110 Aerodrome operating minimums

CIRCLING OPERATIONS - AEROPLANES

a. Circling Minimums

The following standards should apply for establishing circling minimums for operations with aeroplanes:

1. The MDH for circling operation should not be lower than the highest of:
   i. the published circling OCH for the aeroplane category;
   ii. the minimum circling height derived from Table 7; or
   iii. the DH/MDH of the preceding instrument approach procedure;
2. The MDA for circling should be calculated by adding the published aerodrome elevation to the MDH, as determined by a.1.; and
3. The minimum visibility for circling should be the highest of:
   i. the circling visibility for the aeroplane category, if published;
   ii. the minimum visibility derived from Table 7; or
   iii. the RVR/CMV derived from Tables 5 and 6.A for the preceding instrument approach procedure.

AMC7 CAT.OP.MPA.110 Table 7 Circling - Aeroplanes MDH and Minimum Visibility vs. Aeroplane Category

Aircraft Category	A	B	C	D
MDH (ft)	400	500	600	700
VIS (m)	1500	1600	2400	3600

b. Conduct of flight - general

1. The MDH and OCH included in the procedure are referenced to aerodrome elevation;
2. The MDA is referenced to Mean Sea Level;
3. For these procedures, the applicable visibility is the meteorological visibility; and
4. Operators should provide tabular guidance of the relationship between height above threshold and the in-flight visibility required to obtain and sustain visual conduct during the circling maneuver.

c. Instrument approach followed by visual manoeuvring (circling) without prescribed tracks

1. When the aeroplane is on the initial instrument approach, before visual reference is stabilised, but not below MDA/H, the aeroplane should follow the corresponding instrument approach procedure until the appropriate instrument MAPt is reached.
2. At the beginning of the level flight phase at or above the MDA/H, the instrument approach track determined by radio navigation aids, RNAV, RNP, ILS, MLS or GLS should be maintained until the pilot:
   i. estimates that, in all probability, visual contact with the runway of intended landing or the runway environment will be maintained during the entire circling procedure;
   ii. estimates that the aeroplane is within the circling area before commencing circling; and
   iii. is able to determine the aeroplane's position in relation to the runway of intended landing with the aid of the appropriate external references.
5. Flight maneuvers should be carried out at an altitude/height that is not less than the circling MDA/H.
6. Descent below MDA/H should not be initiated until the threshold of the runway to be used has been appropriately identified.

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The aeroplane should be in a position to continue with a normal rate of descent and land within the touchdown zone.

d. Instrument approach followed by a visual manoeuvring (circling) with prescribed tracks
   1. The aeroplane should remain on the initial instrument approach procedure until one of the following is reached:
      i. the prescribed divergence point to commence circling on the prescribed track; or
      ii. the MAPt.
   4. When commencing the prescribed circling maneuver at the published divergence point, the subsequent maneuvers should be conducted to comply with the published routing and published heights/altitudes.

AMC9 CAT.OP.MPA.110 Aerodrome operating minimums

VISUAL APPROACH OPERATIONS

The operator should not use an RVR of less than 800m for a visual approach operation.

10 DETERMINATION OF AOM FOR CAT I PRECISION, APV AND NON-PRECISION APPROACHES

DECISION HEIGHT/MINIMUM DESCENT HEIGHT

AMC3 CAT.OP.MPA.110 Aerodrome operating minimums

NPA, APV, CAT I OPERATIONS

a. The decision height (DH) to be used for a non-precision approach (NPA) flown with the continuous descent final approach (CDFA) technique, approach procedure with vertical guidance (APV) or CAT I operation should not be lower than the highest of:
   1. the minimum height to which the approach aid can be used without the required visual reference;
   2. the obstacle clearance height (OCH) for the category of aircraft;
   3. the published approach procedure DH where applicable;
   4. the system minimum specified in Table 3; or
   5. the minimum DH specified in the aircraft flight manual (AFM) or equivalent document, if stated.
b. The minimum descent height (MDH) for an NPA operation flown without the CDFA technique should not be lower than the highest of:
   1. the OCH for the category of aircraft;
   2. the system minimum specified in Table 3; or
   3. the minimum MDH specified in the AFM, if stated.

AMC3 CAT.OP.MPA.110 Table 3 System Minimums

Facility	Lowest DH/MDH (ft)
ILS/MLS/GLS/PAR GNSS/SBAS CAT I (LPV)	200
GNSS (LNAV) GNSS/Baro-VNAV (LNAV/VNAV) LOC with or without DME SRA (terminating at 0.5nm) VOR/DME	250
SRA (terminating at 1nm) VOR NDB/DME	300
SRA (terminating at 2nm or more) NDB VDF	350

GM3 CAT.OP.MPA.110 Aerodrome operating minimums

SBAS OPERATIONS

a. SBAS CAT I operations with a DH of 200ft depend on an SBAS system approved for operations down to a DH of 200ft.

REQUIRED RVR

AMC4 CAT.OP.MPA.110 Aerodrome operating minimums

CRITERIA FOR ESTABLISHING RVR/CMV

a. Aeroplanes

   The following criteria for establishing RVR/CMV should apply:
   1. In order to qualify for the lowest allowable values of RVR/CMV specified in Table 6.A the instrument approach should meet at least the following facility specifications and associated conditions:
      i. Instrument approaches with designated vertical profile up to and including 4.5° for category A and B aeroplanes, or 3.77° for category C and D aeroplanes where the facilities are:
         A. ILS/MLS/GLS/PAR or
         B. APV; and

         where the final approach track is offset by not more than 15° for category A and B aeroplanes or by not more than 5° for category C and D aeroplanes.
      ii. Instrument approach operations flown using the CDFA technique with a nominal vertical profile, up to and including 4.5° for category A and B aeroplanes, or 3.77° for cate-

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS

gory C and D aeroplanes, where the facilities are NDB, NDB/DME, VOR, VOR/DME, LOC, LOC/DME, VDF, SRA or GNSS/LNAV, with a final approach segment of at least 3NM, which also fulfil the following criteria:

A. the final approach track is offset by not more than 15° for category A and B aeroplanes or by not more than 5° for category C and D aeroplanes;

B. the final approach fix (FAF) or another appropriate fix where the descent is initiated is available, or distance to threshold (THR) is available by flight management system/GNSS (FMS/GNSS) or DME; and

C. if missed approach point (MAPt) is determined by timing, the distance from FAF or another appropriate fix to THR is ≤ 8nm.

iii. Instrument approaches where the facilities are NDB, NDB/DME, VOR, VOR/DME, LOC, LOC/DME, VDF, SRA or GNSS/LNAV, not fulfilling the criteria in a.1.ii., or with an MDH ≥ 1200ft.

AMC5 CAT.OP.MPA.110 Aerodrome operating minimums

DETERMINATION OF RVR/CMV MINIMUMS FOR NPA, APV, CAT I - AEROPLANES

a. Aeroplanes

The RVR/CMV/VIS minimums for NPA, APV and CAT I operations should be determined as follows:

1. The minimum RVR/CMV should be the highest of the values specified in Table 5 or Table 6.A but not greater than the maximum values specified in Table 6.A, where applicable.
3. If the approach is flown with a level flight segment at or above MDA/H, 200m should be added for category A and B aeroplanes and 400m for category C and D aeroplanes to the minimum RVR/CMV value resulting from the application of Tables 5 and 6.A.
4. An RVR of less than 750m as indicated in Table 5 may be used:
   i. for CAT I operations to runways with full approach lighting systems (FALS), runway touchdown zone lights (RTZL) and runway centerline lights (RCLL);
   ii. for CAT I operations to runways without RTZL and RCLL when using an approved head-up guidance landing system (HUDLS), or equivalent approved system, or when conducting a coupled approach or flight-director flown approach to a DH. The ILS should not be published as a restricted facility; and
   iii. for APV operations to runways with FALS, RTZL and RCLL when using an approved head-up display (HUD).
5. Lower values than those specified in Table 5, for HUDLS and auto-land operations may be used if approved in accordance with Annex V (Part-SPA), Subpart E (SPA. LVO) of the regulation.

RVR RELATED TO DH/MDH AND LIGHTING SYSTEM

AMC5 CAT.OP.MPA.110 Table 5 RVR vs. DH/MDH and Lights - All Aircraft Categories

	RVR (m) depending on Class of Lighting Facilities			
DH or MDH (ft)	FALS	IALS	BALS	NALS
200-210	550	750	1000	1200
211-220	550	800	1000	1200
221-230	550	800	1000	1200
231-240	550	800	1000	1200
241-250	550	800	1000	1300
251-260	600	800	1100	1300
261-280	600	900	1100	1300
281-300	650	900	1200	1400
301-320	700	1000	1200	1400
321-340	800	1100	1300	1500
341-360	900	1200	1400	1600
361-380	1000	1300	1500	1700
381-400	1100	1400	1600	1800
401-420	1200	1500	1700	1900
421-440	1300	1600	1800	2000
441-460	1400	1700	1900	2100
461-480	1500	1800	2000	2200
481-500	1500	1800	2100	2300

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AMC5 CAT.OP.MPA.110 Table 5 RVR vs. DH/MDH and Lights - All Aircraft Categories (continued)

	RVR (m) depending on Class of Lighting Facilities			
DH or MDH (ft)	FALS	IALS	BALS	NALS
501-520	1600	1900	2100	2400
521-540	1700	2000	2200	2400
541-560	1800	2100	2300	2500
561-580	1900	2200	2400	2600
581-600	2000	2300	2500	2700
601-620	2100	2400	2600	2800
621-640	2200	2500	2700	2900
641-660	2300	2600	2800	3000
661-680	2400	2700	2900	3100
681-700	2500	2800	3000	3200
701-720	2600	2900	3100	3300
721-740	2700	3000	3200	3400
741-760	2700	3000	3300	3500
761-800	2900	3200	3400	3600
801-850	3100	3400	3600	3800
851-900	3300	3600	3800	4000
901-950	3600	3900	4100	4300
951-1000	3800	4100	4300	4500
1001-1100	4100	4400	4600	4900
1101-1200	4600	4900	5000	5000
1200 and above	5000	5000	5000	5000

AMC5 CAT.OP.MPA.110 Table 6.A CAT I, APV, NPA - Aeroplanes
Minimum and Maximum applicable RVR (lower and upper Cut-off Limits)

Facility/Conditions	RVR (m)	Aeroplane Category			
		A	B	C	D
ILS, MLS, GLS, PAR, GNSS/SBAS, GNSS/VNAV	Min	According to AMC5 CAT.OP.MPA.110 Table 5			
	Max	1500	1500	2400	2400
NDB, NDB/DME, VOR, VOR/DME, LOC, LOC/DME, VDF, SRA, GNSS/LNAV with a procedure that fulfils the criteria in AMC4 CAT.OP.MPA.110 a.1.(ii)	Min	750	750	750	750
	Max	1500	1500	2400	2400
NDB, NDB/DME, VOR, VOR/DME, LOC, LOC/DME, VDF, SRA, GNSS/LNAV: – not fulfilling the criteria in AMC4 CAT.OP.MPA.110 a.1.(ii); or – with a DH or MDH ≥ 1200ft.	Min	1000	1000	1200	1200
	Max	According to AMC5 CAT.OP.MPA.110 Table 5 if flown using the CDFA technique, otherwise an add-on of 200m for category A and B aeroplanes and 400m for category C and D aeroplanes applies to the values in AMC5 CAT.OP.MPA.110 Table 5 but not to result in a value exceeding 5000m.			

11 DETERMINATION OF AOM FOR LOWER THAN STANDARD CAT I OPERATIONS

SPA.LVO.100 Low visibility operations

The operator shall only conduct the following low visibility operations (LVO) when approved by the competent authority:

b. Lower than standard category I (LTS CAT I) operations.

SPA.LVO.110 General operating requirements

a. The operator shall only conduct LTS CAT I operations if:

1. each aircraft concerned is certified for operations to conduct CAT II operations; and
2. the approach is flown:
   i. auto-coupled to an auto-land that needs to be approved for CAT IIIA operations; or
   ii. using an approved head-up display landing system (HUDLS) to at least 150ft above the threshold.

SPA.LVO.115 Aerodrome related requirements

a. The operator shall not use an aerodrome for LVOs below a visibility of 800m unless:

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1. the aerodrome has been approved for such operations by the State of the aerodrome; and
2. low visibility procedures (LVP) have been established.

AMC3 SPA.LVO.100 Low visibility operations

LTS CAT I OPERATIONS

a. For lower than standard category I (LTS CAT I) operations the following provisions should apply:
   1. The decision height (DH) of an LTS CAT I operation should not be lower than the highest of:
      i. the minimum DH specified in the AFM, if stated;
      ii. the minimum height to which the precision approach aid can be used without the specified visual reference;
      iii. the applicable obstacle clearance height (OCH) for the category of aeroplane;
      iv. the DH to which the flight crew is qualified to operate; or
      v. 200ft.
   2. An instrument landing system/microwave landing system (ILS/MLS) that supports an LTS CAT I operation should be an unrestricted facility with a straight-in course ≤ 3° offset, and the ILS should be certified to:
      i. class I/T/1 for operations to a minimum of 450m RVR; or
      ii. class II/D/2 for operations to less than 450m RVR.

      Single ILS facilities are only acceptable if level 2 performance is provided.
   3. The following visual aids should be available:
      i. standard runway day markings, approach lights, runway edge lights, threshold lights and runway end lights;
      ii. for operations with an RVR below 450m, additionally touch-down zone and/or runway centerline lights.
   4. The lowest RVR minimums to be used are specified in Table 2.

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AMC3 SPA.LVO.100 Table 2 RVR LTS CAT I Operation Minimums
RVR vs. Approach Lighting System

DH (ft)	RVR (m) depending on Class of Light Facility			
	FALS	IALS	BALS	NALS
200-210	400	500	600	750
211-220	450	550	650	800
221-230	500	600	700	900
231-240	500	650	750	1000
241-249	550	700	800	1100

12 DETERMINATION OF AOM FOR STANDARD AND OTHER THAN STANDARD CAT II OPERATIONS

SPA.LVO.110 General operating requirements

b. The operator shall only conduct CAT II, OTS CAT II … operations if:
   1. each aircraft concerned is certified for operations with a decision height (DH) below 200ft, or no DH, and equipped in accordance with the applicable airworthiness requirements;
   2. a system for recording approach and/or automatic landing success and failure is established and maintained to monitor the overall safety of the operation;
   3. the DH is determined by means of a radio altimeter;
   4. the flight crew consists of at least two pilots;
   5. all height call-outs below 200ft above the aerodrome threshold elevation are determined by a radio altimeter.

AMC4 SPA.LVO.100 Low visibility operations

CAT II AND OTS CAT II OPERATIONS

a. For CAT II and other than standard category II (OTS CAT II) operations the following provisions should apply:
   1. The ILS/MLS that supports OTS CAT II operation should be an unrestricted facility with a straight-in course ≤ 3° offset and the ILS should be certified to class II/D/2.

      Single ILS facilities are only acceptable if level 2 performance is provided.
   2. The DH for CAT II and OTS CAT II operation should not be lower than the highest of:
      i. the minimum DH specified in the AFM, if stated;
      ii. the minimum height to which the precision approach aid can be used without the specified visual reference;
      iii. the applicable OCH for the category of aeroplane;
      iv. the DH to which the flight crew is qualified to operate; or
      v. 100ft.
   3. The following visual aids should be available:

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i. standard runway day markings and approach and the following runway lights: runway edge lights, threshold lights and runway end lights;

ii. for operations in RVR below 450m, additionally touch-down zone and/or runway centerline lights;

iii. for operations with an RVR of 400m or less, additionally centerline lights.

4. The lowest RVR minimums to be used are specified:

i. for CAT II operations in Table 3; and

ii. for OTS CAT II operations in Table 4.

b. For OTS CAT II operations, the terrain ahead of the runway threshold should have been surveyed.

AMC4 SPA.LVO.100 Table 3 CAT II Operation Minimums RVR vs. DH

DH (ft)	RVR (m)	
	CAT A, B, C	CAT D
100-120	300	300/350
121-140	400	
141-199	450	

Auto-coupled or approved HUDLS to below DH - This means continued use of the automatic flight control system or the HUDLS down to a height of 80% of the DH.

An RVR of 300m instead of 350m may be used for CAT D aircraft conducting an auto-land.

AMC4 SPA.LVO.100 Table 4 OTS CAT II Operation Minimums RVR vs. Aproach Lighting System

DH (ft)	RVR (m)				
	FALS		IALS	BALS	NALS
	CAT A-C	CAT D	CAT A-D	CAT A-D	CAT A-D
100-120	350	400	450	600	700
121-140	400	450	500	600	700
141-160	450[1]	500	500	600	750
161-199	450[1]	500	550	650	750

[1] The EASA table shows 400m, but this would be lower than the Standard CAT II operations. This is already reported, but not yet corrected by EASA.

Auto-land or approved HUDLS utilised to touchdown.

13 DETERMINATION OF AOM FOR CAT III OPERATIONS

SPA.LVO.110 General operating requirements

b. The operator shall only conduct … CAT III operations if:

1. each aircraft concerned is certified for operations with a decision height (DH) below 200ft, or no DH, and equipped in accordance with the applicable airworthiness requirements;
2. a system for recording approach and/or automatic landing success and failure is established and maintained to monitor the overall safety of the operation;
3. the DH is determined by means of a radio altimeter;
4. the flight crew consists of at least two pilots;
5. all height call-outs below 200ft above the aerodrome threshold elevation are determined by a radio altimeter.

AMC5 SPA.LVO.100 Low visibility operations

CAT III OPERATIONS

The following provisions should apply to CAT III operations:

a. Where the DH and RVR do not fall within the same category, the RVR should determine in which category the operation is to be considered.

b. For operations in which a DH is used, the DH should not be lower than:

1. the minimum DH specified in the AFM, if stated;
2. the minimum height to which the precision approach aid can be used without the specified visual reference; or
3. the DH to which the flight crew is qualified to operate.

c. Operations with no DH should only be conducted if:

1. the operation with no DH is specified in the AFM;
2. the approach aid and the aerodrome facilities can support operations with no DH; and
3. the flight crew is qualified to operate with no DH.

d. The lowest RVR minimums to be used are specified in Table 5.

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS

AMC5 SPA.LVO.100 Table 5
CAT III Operations Minimums
RVR vs. DH and Rollout Control/Guidance System

CAT	DH (ft)	Rollout Control/ Guidance System	RVR (m)
IIIA	Less than 100	Not required	200
IIIB	Less than 100	Fail-passive	150
IIIB	Less than 50	Fail-passive	125
IIIB	Less than 50 or no DH	Fail-operational	75

Flight control system redundancy is determined under CS-AWO by the minimum certified DH.

RVR 150m is valid for aeroplanes certified in accordance with CS-AWO 321(b)(3) or equivalent.

The fail-operational system referred to may consist of a fail-operational hybrid system.

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14 FAILED OR DOWNGRADED EQUIPMENT

CAT.OP.MPA.110 Aerodrome operating minimums

c. When establishing aerodrome operating minimums, the operator shall the following take-into account:

4. the adequacy and performance of the available visual and non-visual ground aids;

e. The minimums for a specific approach and landing procedure shall only be used if all the following conditions are met:

1. The ground equipment shown on the chart required for the intended procedure is operative.

AMC11 CAT.OP.MPA.110 Aerodrome operating minimums

EFFECT ON LANDING MINIMUMS OF TEMPORARILY FAILED OR DOWNGRADED GROUND EQUIPMENT

AMC11 CAT.OP.MPA.110 Table 9 Failed or Downgraded Equipment - Effect on Landing Minimums Operations without a Low Visibility Operations Approval

Failed or Downgraded Equipment	Effect on Landing Minimums	
	CAT I	APV, NPA
ILS/MLS stand-by transmitter	No effect	
Outer Marker	Not allowed except if replaced by height check at 1000ft	APV - not applicable
		NPA with FAF - no effect unless used as FAF
		If the FAF cannot be identified (e.g. no method available for timing of descent), non-precision operations cannot be conducted
Middle Marker	No effect	No effect unless used as MAPt
RVR Assessment Systems	No effect	
Approach lights	Minimums as for NALS	
Approach lights except the last 210m	Minimums as for BALS	
Approach lights except the last 420m	Minimums as for IALS	
Standby power for approach lights	No effect	
Edge lights, threshold lights and runway end lights	Day: no effect Night: not allowed	
Centerline lights	No effect if F/D, HUDLS or autoland; otherwise RVR 750m	No effect
Centerline lights spacing increased to 30m	No effect	
Touchdown zone lights	No effect if F/D, HUDLS or autoland; otherwise RVR 750m	No effect
Taxiway lighting system	No effect	

AMC7 SPA.LVO.100 Low visibility operations

EFFECT ON LANDING MINIMUMS OF TEMPORARILY FAILED OR DOWNGRADED GROUND EQUIPMENT

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS

AMC7 SPA.LVO.100 Table 7 Failed or downgraded Equipment - Effect on Landing Minimums Operations with an LVO Approval

Failed or downgraded equipment	Effect on Landing Minimums			
	CAT IIIB (no DH)	CAT IIIB	CAT IIIA	CAT II
ILS/MLS stand-by transmitter	Not allowed	RVR 200m	No effect	
Outer marker	No effect if replaced by height check at 1000ft			
Middle marker	No effect			
RVR assessment systems	At least one RVR value to be available on the aerodrome	On runways equipped with 2 or more RVR assessment units, one may be inoperative		
Approach lights	No effect	Not allowed for operations with DH > 50ft		Not allowed
Approach lights except the last 210m	No effect			Not allowed
Approach lights except the last 420m	No effect			
Stand-by power for approach lights	No effect			
Edge lights, threshold lights and runway end lights	No effect		Day: No effect Night: RVR 550m	Day: No effect Night: Not allowed
Centerline lights	Day: RVR 200m Night: Not allowed	Not allowed	Day: RVR 300m Night: RVR 400m	Day: RVR 350m Night: RVR 550m (RVR 400m with HUDLS or auto-land)
Centerline lights Spacing increased to 30m	RVR 150m		No effect	
Touchdown zone lights	No effect	Day: RVR 200m Night: RVR 300m	Day: RVR 300m Night: RVR 550m (RVR 350m with HUDLS or auto-land)	
Taxiway light system	No effect			

15 ENHANCED VISION SYSTEMS - RVR REDUCTION

CAT.OP.MPA.110 Aerodrome operating minimums

b. The use of a head-up display (HUD), head-up guidance landing system (HUDLS) or enhanced vision system (EVS) may allow operations with lower visibilities than the established aerodrome operating minimums if approved in accordance with SPA.LVO.

SPA.LVO.110 General operating requirements

c. The operator shall only conduct approach operations utilising an EVS if:
   1. the EVS is certified for the purpose of this subpart and combines infra-red sensor image and flight information on the HUD;
   2. for operations with an RVR below 550m, the flight crew consists of at least two pilots;
   3. for CAT I operations, natural visual reference to runway cues is attained at least at 100ft above the aerodrome threshold elevation;
   4. for approach procedure with vertical guidance (APV) and non-precision (NPA) operations flown with CDFA technique, natural visual reference to runway cues is attained at least at 200ft above the aerodrome threshold elevation and the following requirements are complied with:
      i. the approach is flown using an approved vertical flight path guidance mode;
      ii. the approach segment from final approach fix (FAF) to runway threshold is straight and the difference between the final approach course and the runway centerline is not greater than 2°;
      iii. the final approach path is published and not greater than 3.7°;
      iv. the maximum cross-wind components established during certification of the EVS are not exceeded.

AMC6 SPA.LVO.100 Low visibility operations

OPERATIONS UTILISING EVS

The pilot using a certified enhanced vision system (EVS) in accordance with the procedures and limitations of the AFM:

a. may reduce the RVR value in column 1 to the value in column 2 of Table 6 below for CAT I operations, APV operations and NPA operations flown with the CDFA technique;

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS

b. for CAT I operations:

1. may continue an approach below DH to 100ft above the runway threshold elevation provided that a visual reference is displayed and identifiable on the EVS image; and
2. should only continue an approach below 100ft above the runway threshold elevation provided that a visual reference is distinctly visible and identifiable to the pilot without reliance on the EVS;

c. for APV operations and NPA operations flown with the CDFA technique:

1. may continue an approach below DH to 200ft above the runway threshold elevation provided that a visual reference is displayed and identifiable on the EVS image; and
2. should only continue an approach below 200ft above the runway threshold elevation provided that a visual reference is distinctly visible and identifiable to the pilot without reliance on the EVS.

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AMC6 SPA.LVO.100 Table 6 Operations utilising EVS - RVR Reduction vs. Normal RVR

Required RVR (m)	Reduced RVR (m) when using EVS
550	350
600	400
650	450
700	450
750	500
800	550
900	600
1000	650
1100	750
1200	800
1300	900
1400	900
1500	1000
1600	1100
1700	1100
1800	1200
1900	1300
2000	1300
2100	1400
2200	1500
2300	1500
2400	1600
2500	1700
2600	1700
2700	1800
2800	1900
2900	1900
3000	2000
3100	2000
3200	2100
3300	2200
3400	2200

AMC6 SPA.LVO.100 Table 6 Operations utilising EVS - RVR Reduction vs. Normal RVR (continued)

Required RVR (m)	Reduced RVR (m) when using EVS
3500	2300
3600	2400
3700	2400
3800	2500
3900	2600
4000	2600
4100	2700
4200	2800
4300	2800
4400	2900
4500	3000
4600	3000
4700	3100
4800	3200
4900	3200
5000	3300

16 SINGLE PILOT OPERATIONS - ADDITIONAL CRITERIA

AMC5 CAT.OP.MPA.110 Aerodrome operating minimums

DETERMINATION OF RVR MINIMUMS FOR NPA, APV, CAT I - AEROPLANES

a. Aeroplanes

The RVR minimums for NPA, APV and CAT I operations should be determined as follows:

8. For single pilot operations, the minimum RVR should be calculated in accordance with the following additional criteria:
   i. An RVR of less than 800m as indicated in CAT.OP.MPA.110 Table 5 may be used for CAT I approaches provided any of the following is used at least down to the applicable DH:
      A. a suitable autopilot, coupled to an ILS, MLS or GLS that is not published as restricted; or
      B. an approved HUDLS, including, where appropriate, enhanced vision system (EVS), or equivalent approved system;
   ii. where RTZL and/or RCLL are not available, the minimum RVR should not be less than 600m; and
   iii. an RVR of less than 800m as indicated in CAT.OP.MPA.110 Table 5 may be used for APV operations to runways with FALS, RTZL and RCLL when using an approved HUDLS, or equivalent approved system, or when conducting a coupled approach to a DH equal to or greater than 250ft.

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17 PLANNING MINIMUMS

CAT.OP.MPA.185 Planning minimums for IFR flights - aeroplanes

a. **Planning Minimums for a Take-off Alternate Aerodrome**

The operator shall only select an aerodrome as a take-off alternate aerodrome when the appropriate weather reports and/or forecasts indicate that, during a period commencing one hour before and ending one hour after the estimated time of arrival at the aerodrome, the weather conditions will be at or above the applicable landing minimums specified in accordance with CAT.OP.MPA.110. The ceiling shall be taken into account when the only approach operations available are non-precision approaches (NPA) and/or circling operations. Any limitation related to OEI (one engine inoperative) operations shall be taken into account.

b. **Planning Minimums for a Destination Aerodrome, other than an Isolated Destination Aerodrome**

The operator shall only select the destination aerodrome when:

1. the appropriate weather reports and/or forecasts indicate that, during a period commencing one hour before and ending one hour after the estimated time of arrival at the aerodrome, the weather conditions will be at or above the applicable planning minimums as follows:
   i. RVR/visibility (VIS) specified in accordance with CAT.OP.MPA.110; and
   ii. for an NPA or a circling operation, the ceiling at or above MDH;

   or
2. two destination alternate aerodromes are selected.

c. **Planning Minimums for a Destination Alternate Aerodrome, Isolated Aerodrome, Fuel Enroute Alternate (fuel ERA) Aerodrome, Enroute Alternate (ERA) Aerodrome**

The operator shall only select an aerodrome for one of these purposes when the appropriate weather reports and/or forecasts indicate that, during a period commencing one hour before and ending one hour after the estimated time of arrival at the aerodrome, the weather conditions will be at or above the planning minimums in Table 1.

CAT.OP.MPA185 Table 1 Destination Alternate Aerodrome, Isolated Destination Aerodrome, Fuel ERA and ERA Aerodrome

Type of Approach	Planning Minimums
CAT II and III	CAT I RVR
CAT I	NPA RVR/VIS Ceiling shall be at or above MDH
NPA	NPA RVR/VIS + 1000m Ceiling shall be at or above MDH + 200ft
Circling	Circling

GM1 CAT.OP.MPA.185 Planning minimums for IFR flights - aeroplanes

PLANNING MINIMUMS FOR ALTERNATE AERODROMES

As Table 1 does not include planning minimums requirements for APV, LTS CAT I and OTS CAT II operations, the operator may use the following minimums:

a. for APV operations - NPA or CAT I minimums, depending on the DH/MDH;
b. for LTS CAT I operations - CAT I minimums; and
c. for OTS CAT II operations - CAT II minimums.

SPA.ETOPS.115 ETOPS enroute alternate aerodrome planning minimums

a. The operator shall only select an aerodrome as an ETOPS enroute alternate aerodrome when the appropriate weather reports or forecasts, or any combination thereof, indicate that, between the anticipated time of landing until one hour after the latest possible time of landing, conditions will exist at or above the planning minimums calculated by adding the additional limits of Table 1 below.
b. The operator shall include in the operations manual the method for determining the operating minimums at the planned ETOPS enroute alternate aerodrome.

SPA.ETOPS.115 Table 1 Planning Minimums for ETOPS Enroute Alternate Aerodrome

Type of Approach	Planning Minimums
Precision approach	DA/H + 200ft RVR/VIS + 800m
Non-precision approach or circling approach	MDA/H + 400ft RVR/VIS + 1500m

18 COMMENCEMENT AND CONTINUATION OF APPROACH (APPROACH BAN)

CAT.OP.MPA.305 - Commencement and continuation of approach

a. The commander or the pilot to whom conduct of the flight has been delegated may commence an instrument approach regardless of the reported RVR/VIS.

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS

b. If the reported RVR/VIS is less than the applicable minimum the approach shall not be continued:
   1. below 1000ft above the aerodrome; or
   2. into the final approach segment in the case where DA/H or MDA/H is more than 1000ft above the aerodrome.

c. Where the RVR is not available, RVR values may be derived by converting the reported visibility.

d. If, after passing 1000ft above the aerodrome, the reported RVR/VIS falls below the applicable minimum, the approach may be continued to DA/H or MDA/H.

e. The approach may be continued below DA/H or MDA/H and the landing may be completed, provided that the visual reference adequate for the type of approach operation and for the intended runway is established at the DA/H or MDA/H and is maintained.

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f. The touchdown zone RVR shall always be controlling. If reported and relevant, the midpoint and stopend RVR shall also be controlling. The minimum RVR value for the midpoint shall be 125m or the RVR required for the touchdown zone if less, and 75m for the stopend. For aircraft equipped with a rollout guidance control system, the minimum RVR value for the midpoint shall be 75m.

AMC1 CAT.OP.MPA.305(e) - Commencement and continuation of approach

VISUAL REFERENCES FOR INSTRUMENT APPROACH OPERATIONS

a. NPA, APV and CAT I operations

   At DH or MDH, at least one of the visual references specified below should be distinctly visible and identifiable to the pilot:
   1. elements of the approach lighting system;
   2. threshold;
   3. threshold markings;
   4. threshold lights;
   5. threshold identification lights;
   6. visual glide slope indicator;
   7. touchdown zone or touchdown zone markings;
   8. touchdown zone lights;
   9. FATO/runway edge lights; or
   10. other visual references specified in the operations manual.

b. Lower than Standard CAT I (LTS CAT I) operations

   At DH, the visual references specified below should be distinctly visible and identifiable to the pilot:
   1. a segment of at least three consecutive lights, being the centerline of the approach lights, or touchdown zone lights, or runway centerline lights, or runway edge lights, or a combination of these;
   2. this visual reference should include a lateral element of the ground pattern, such as an approach light crossbar or the landing threshold or a barrette of the touchdown zone light unless the operation is conducted utilising an approved HUDLS useable to at least 150ft.

c. CAT II or OTS CAT II operations

   At DH, the visual references specified below should be distinctly visible and identifiable to the pilot:
   1. a segment of at least three consecutive lights, being the centerline of the approach lights, or touchdown zone lights, or runway centerline lights, or runway edge lights, or a combination of these;
   2. this visual reference should include a lateral element of the ground pattern, such as an approach light crossbar or the landing threshold or a barrette of the touchdown zone light unless the operation is conducted utilising an approved HUDLS to touchdown.

d. CAT III operations
   1. For CAT IIIA operations and for CAT IIIB operations conducted either with fail-passive flight control systems or with the use of an approved HUDLS: at DH, a segment of at least three consecutive lights being the centerline of the approach lights, or touchdown zone lights, or runway centerline lights, or runway edge lights, or a combination of these is attained and can be maintained by the pilot.
   2. For CAT IIIB operations conducted either with fail-operational flight control systems or with a fail-operational hybrid landing system using a DH: at DH, at least one centerline light is attained and can be maintained by the pilot.
   3. For CAT IIIB with no DH there is no specification for visual reference with the runway prior to touchdown.

e. Approach operations utilising EVS - CAT I operations
   1. At DH, the following visual references should be displayed and identifiable to the pilot on the EVS image:
      i. Elements of the approach light; or
      ii. The runway threshold, identified by at least one of the following:
         A. the beginning of the runway landing surface; or
         B. the threshold lights, the threshold identification lights; or
         C. the touchdown zone, identified by at least one of the following: the runway touchdown zone lights, the touchdown zone markings or the runway lights.

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS

2. At 100ft above runway threshold elevation at least one of the visual references specified below should be distinctly visible and identifiable to the pilot without reliance on the EVS:
    i. the lights or markings of the threshold; or
    ii. the lights or markings of the touchdown zone.

f. Approach operations utilising EVS - APV and NPA operations flown with the CDFA technique
    1. At DH/MDH, visual reference should be displayed and identifiable to the pilot on the EVS image as specified under a.
    2. At 200ft above runway threshold elevation, at least one of the visual references specified under a. should be distinctly visible and identifiable to the pilot without reliance on the EVS.

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AERODROME OPERATING MINIMUMS - JEPPESEN

JEPPESEN AOM POLICY

WITH STATE-PROVIDED MINIMUMS

State-provided minimums will be charted.

Missing minimums will be determined according to the guidance in ICAO Doc 9365, but not lower than any State-provided value.

WITHOUT STATE-PROVIDED MINIMUMS

Minimums will be determined according to the guidance in ICAO Doc 9365.

ICAO DOC 9365 (TABLES AND RULES)

APPROACH LIGHTING SYSTEMS

Approach lights will be classified as FALS, IALS, BALS and NALS as shown in Table B-1 below. Landing minimums depend on available approach lights.

NOTE: Classification of approach lights will not be shown on Jeppesen charts.

Table B-1: Approach lights classification

Class of Facility	Length, Configuration and Intensity of Approach Lights
FALS (full approach lighting system) (see Annex 14)	Precision approach CAT I lighting system (HIALS ≥ 720m) Distance coded centerline, barrette centerline
IALS (intermediate approach lighting system) (see Annex 14)	Simple approach lighting system (HIALS 420m to 719m) single source, barrette
BALS (basic approach lighting system)	Any other approach lighting system (HIALS, MIALS or ALS 210m to 419m)
NALS (no approach lighting system)	Any other approach lighting system (HIALS, MIALS or ALS < 210m) or no approach lights

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TAKE-OFF MINIMUMS

Take-off minimums depend on available runway lighting and marking, and availability of an approved lateral guidance system as shown in Table 6-1.

Lowest RVR of 75m is only shown if this information is provided by State source or if the runway is approved for CAT IIIB operations with an RVR of 75m.

Take-off minimums should not be less than the applicable minimums for landing at the aerodrome unless a suitable take-off alternate aerodrome is available.

Table 6-1: Take-off Minimums

Facilities	RVR/VIS (1)
Adequate visual reference (day only) (2)	500m/1600ft
Runway edge lights or runway centerline markings (3)	400m/1200ft
Runway edge lights and runway centerline markings (3)	300m/1000ft
Runway edge lights and runway centerline lights	200m/600ft
Runway edge lights and runway centerline lights and relevant RVR information (4)	TDZ 150m/500ft MID 150m/500ft Stop-end 150m/500ft
High intensity runway edge lights and runway centerline lights (spacing 15m or less) and relevant RVR information (4)	TDZ 125m/400ft MID 125m/400ft Stop-end 125m/400ft
High intensity runway edge lights and runway centerline lights (spacing 15m or less), approved lateral guidance system and relevant RVR information (4)	TDZ 75m/300ft MID 75m/300ft Stop-end 75m/300ft

(1) The TDZ RVR/VIS may be assessed by the pilot.

(2) Adequate visual reference means that a pilot is able to continuously identify the take-off surface and maintain directional control.

(3) For night operations, at least runway edge lights or centerline lights and runway end lights are available.

(4) The required RVR is achieved for all relevant RVRs.

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AERODROME OPERATING MINIMUMS - JEPPESEN

Rule

a. Take-off minimums are determined according to the best available runway lighting conditions for the airport.

b. There will be a single box only unless State-provided restrictions require to differentiate between the available runways. In such cases the box will show runway specific take-off minimums.

CIRCLING MINIMUMS

Circling minimums depend on Procedure Design Criteria (PANS-OPS, TERPS), Circling OCH/MDH and aircraft category as shown in Table 6-2.

Approach lights have no effect on circling minimums.

Table 6-2: Circling Minimums

	CAT A	CAT B	CAT C	CAT D
Max IAS	100kt	135kt	180kt	205kt
Lowest MDH	400ft	500ft	600ft	700ft
Minimum meteorological visibility	1500m	1600m	2400m	3600m

a. Speeds are according to PANS-OPS, Volume I (Doc 8168).

b. The circling visibilities differ from those in PANS-OPS, Volume I (Doc 8168) since the visual maneuvering (circling) values in Table II-5-6-1 of Doc 8168 are not intended for establishment of operating Minimums.

Rules

a. Minimum Descent Height (MDH) should be the higher of:
   1. the published circling OCH for the aircraft category; or
   2. the minimum circling height derived from the Table 6-2; or
   3. the DH/MDH of the preceding instrument approach procedure.

b. The MDA for circling must be calculated by adding the published airport elevation to the MDH.

c. The minimum visibility for circling should be the higher of:
   1. the circling visibility for the aircraft category, if published; or
   2. the minimum visibility derived from the Table 6-2; or
   3. the RVR minimums for the preceding instrument approach procedure.

d. If circling minimums are lower than straight-in minimums, a note is added to indicate that higher straight-in minimums (descent limit and/or visibility) apply.

PRECISION CAT I, APV AND NON-PRECISION MINIMUMS (NPA)

Approach minimums depend on the OCH/DH/MDH of the approach procedure, the available runway lights, specific procedure requirements and on the flight technique to be used (CDFA vs non-CDFA) on non-precision approaches.

Table 6-3: RVR for CAT I, APV and NPA

DH or MDH (ft)			*Class of lighting facility*			
			FALS	**IALS**	**BALS**	**NALS**
			RVR (meters)			
200	-	210	550	750	1000	1200
211	-	220	550	800	1000	1200
221	-	230	550	800	1000	1200
231	-	240	550	800	1000	1200
241	-	250	550	800	1000	1300
251	-	260	600	800	1100	1300
261	-	280	600	900	1100	1300
281	-	300	650	900	1200	1400
301	-	320	700	1000	1200	1400
321	-	340	800	1100	1300	1500
341	-	360	900	1200	1400	1600
361	-	380	1000	1300	1500	1700
381	-	400	1100	1400	1600	1800
401	-	420	1200	1500	1700	1900

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AERODROME OPERATING MINIMUMS - JEPPESEN

Table 6-3: RVR for CAT I, APV and NPA (continued)

421	-	440	1300	1600	1800	2000
441	-	460	1400	1700	1900	2100
461	-	480	1500	1800	2000	2200
481	-	500	1500	1800	2100	2300
501	-	520	1600	1900	2100	2400
521	-	540	1700	2000	2200	2400
541	-	560	1800	2100	2300	2500
561	-	580	1900	2200	2400	2600
581	-	600	2000	2300	2500	2700
601	-	620	2100	2400	2600	2800
621	-	640	2200	2500	2700	2900
641	-	660	2300	2600	2800	3000
661	-	680	2400	2700	2900	3100
681	-	700	2500	2800	3000	3200
701	-	720	2600	2900	3100	3300
721	-	740	2700	3000	3200	3400
741	-	760	2700	3000	3300	3500
761	-	800	2900	3200	3400	3600
801	-	850	3100	3400	3600	3800
851	-	900	3300	3600	3800	4000
901	-	950	3600	3900	4100	4300
951	-	1000	3800	4100	4300	4500
1001	-	1100	4100	4400	4600	4900
1101	-	1200	4600	4900	5000	5000
1201 and above			5000	5000	5000	5000

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Rules

a. In order to qualify for the lowest allowable values of RVR as detailed in Table 6-3, the instrument approach procedure should be flown as 3D approach and landing operation and needs to meet the following facility requirements and associated conditions:

1. Precision or APV instrument approach procedure with a designated vertical profile which do not require a rate of descent greater than 1000ft/min, unless other approach angles are approved by the authority;
2. Non-precision instrument approach procedures flown using the CDFA technique with a nominal vertical profile which do not require a rate of descent greater than 1000ft/min, unless other approach angles are approved by the authority, where the facilities are NDB, NDB DME, VOR, VOR DME, LOC, LOC DME, VDF, SRA or LNAV/VNAV, with a final approach segment of at least 3NM, which also fulfil the following criteria:
   (a) The final approach track is offset by not more than 15 degrees for CAT A & B aircraft or by not more than 5 degrees for CAT C & D aircraft; and
   (b) The FAF or another appropriate fix where descent is initiated is available, or distance to threshold is available by FMS/RNAV or DME; and
   (c) If the MAP is determined by timing, the distance from FAF to threshold is less than 8NM.

   NOTE: The limiting approach path angle for CAT A & B would be 4.5 degrees and 3.77 degrees for CAT C & D aircraft.

b. An RVR as low as 550m as indicated in Table 6-3 may be used for:

1. CAT I operations to runways with FALS, runway touchdown zone lights and runway centerline lights; or
2. CAT I operations to runways without runway touchdown zone lights and/or runway centerline lights when using an approved HUDLS, or equivalent approved system, or when conducting a coupled approach or flight-director flown approach to DH.

c. Values in Table 6-3 exceeding 1500m (CAT A & B) or 2400m (CAT C & D) do not have to be applied if:

1. The instrument approach operation is based on precision or APV instrument approach procedure; or

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2. If the approach operation is based on NDB, NDB DME, VOR, VOR DME, LOC, LOC DME, VDF, SRA or RNAV without approved vertical guidance but fulfilling the criteria from rule a.2. above.

d. Values in Table 6-3 which are less than 1000m may not be applied if the approach operation is based on NDB, NDB DME, VOR, VOR DME, LOC, LOC DME, VDF, SRA or RNAV without approved vertical guidance if:
   1. The criteria in rule a.2. are not fulfilled; or
   2. The DH or MDH is 1200ft or higher.

e. Some States recommend to increase the RVR Minimums by 200m for CAT A & B and by 400m for CAT C & D aircraft when executing a non-precision approach procedure without using a CDFA flight technique.

Remarks:

For CAT I precision approaches without TDZ and/or CL, the lowest minimums (e.g. R550m) are shown and the higher values (R750m) with the less requirements are shown as note only.

For non-precision approach minimums based on CDFA, the descent label is shown as DA/MDA(H). **This DA/MDA(H) value does not include any add-on to compensate for height-loss.** If the State requires or suggests a specific height loss, a note will be added to indicate this situation.

A DA(H) is shown on non-precision approaches only if published as such on State-provided procedure source. In this case it is assumed that the State of the Aerodrome has incorporated a height loss value.

An MDA(H) is shown on all non-CDFA non-precision approaches, or if the State published an MDA(H) value on procedure source.

PRECISION CAT II MINIMUMS

CAT II precision approach minimums depend on the OCH/DH of the approach procedure, the available runway lights and specific procedure requirements as shown in Table 6-4.

Table 6-4: Approach Minimums CAT II

Decision Height (ft)	CAT A, B & C	CAT D
100-120	RVR 300m	RVR 300m/350m (1)
121-140	RVR 400m	RVR 400m
141-199	RVR 450m	RVR 450m
Remark: CAT II operations coupled to below DH. (1) For CAT D aircraft conducting an autoland, RVR 300m may be used.		

Rules

RVR values will be shown according to Table 6-4. RVR 350m for CAT D will only be shown as note at the bottom of the minimums box, if applicable.

An RA value is shown for every DA(H) if provided by procedure source, or if a Precision Approach Terrain Chart (PATC) is available (PANS-OPS procedures).

If no RA is shown, then the operator may have to apply an additional height-loss for using barometric altimeter (refer to ICAO Doc 8168 PANS-OPS).

PRECISION CAT III MINIMUMS

CAT III precision approach minimums (Table 6-5) depend on runway and aircraft equipment. There must be a clear statement on procedure source that a specific runway is approved for CAT III operations.

Table 6-5: Approach Minimums CAT III

Category	Decision height	Roll-out control/guidance system	RVR
IIIA	Less than 100ft	Not required	175m
IIIB	Less than 100ft	Fail-passive	150m
IIIB	Less than 50ft	Fail-passive	125m
IIIB	Less than 50ft or no DH	Fail-operational (1)	75m
(1) The fail-operational system referred to may consist of a fail-operational hybrid system.			

Rules

a. In the case of a CAT III runway, it may be assumed that operations with no DH can be supported unless specifically restricted as published in the AIP or NOTAM.

b. Depending on source, lowest CAT III, CAT III B & CAT IIIA, or only CAT IIIA minimums are shown.

c. A DH or the requirement for a DH is only shown if this is required by the State of the Aerodrome.

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AERODROME OPERATING MINIMUMS - JEPPESEN

ALTERNATE MINIMUMS

Table D-1: Alternate Minimums

Approach facility configuration	*Ceiling DA/H or MDA/H*	*RVR*
For airports supporting one approach and landing operation.	Authorized DA/H or MDA/H plus an increment of 125m (400ft).	Authorized visibility plus an increment of 1500m.
For airports supporting at least two approach and landing operations, each providing a straight-in approach and landing operation to different, suitable runways.	Authorized DA/H or MDA/H plus an increment of 60m (200ft).	Authorized visibility plus an increment of 800m.
For airports with a published CAT II or CAT III approach and landing operation, and at least two approach and landing operations, each providing a straight-in approach and landing operation to different, suitable runway.	For CAT II procedures, a ceiling of at least 90m (300ft), or for CAT III procedures, a ceiling of at least 60m (200ft).	For CAT II, a visibility of at least RVR 1200m or, for CAT III, a visibility of at least RVR 550m.

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Rule

Alternate minimums will not be shown, unless alternate minimum values are published by the State of the aerodrome.

CONVERSION OF REPORTED METEOROLOGICAL VISIBILITY TO CMV

The conversion (Table E-1) has to be applied by the pilot if the horizontal minimum is charted differently to what is reported by ATC (reported VIS versus RVR on chart).

Table E-1: Conversion factors (VIS to CMV)

Lighting elements in operation	CMV = reported meteorological visibility multiplied by:	
	Day	Night
High intensity approach and runway lighting	1.5	2.0*
Any type of lighting installation other than above	1.0	1.5*
No lighting	1.0	Not applicable
* The relationship between reported visibility and RVR/CMV at night is under review by ICAO.		

Rules

a. All charted values will be labelled as R (= RVR), V (= VIS), C (= CMV) or R/V (= RVR and/or VIS). CMV is only charted if published by the State of the Aerodrome.

b. An operator must ensure that a meteorological visibility to CMV conversion is not used for take-off, for calculating any other required RVR minimum less than 800m, or when reported RVR is available. If a landing minimum is charted as R550m (up to R750m) and there is no RVR reported, the minimum VIS for landing is 800m.

c. Pilot action:

Charted minimum	Reported by ATC	Pilot action
RVR	VIS	Convert reported VIS into CMV. CMV has to be equal to or higher than charted RVR minimum.
RVR and VIS	RVR	Compare reported RVR against charted RVR minimum. No conversion allowed.
	VIS	Compare reported VIS against charted VIS minimum. No conversion allowed.
VIS	RVR	Compare reported RVR against charted VIS minimum. No conversion allowed.
CMV	VIS	Convert reported VIS into CMV, compare against charted CMV minimum.
CMV	RVR	Compare reported RVR against charted CMV minimum.

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AERODROME OPERATING MINIMUMS - JEPPESEN

SYSTEM MINIMUMS

If the procedure source provided OCH is less than the system minimum, the DH/MDH is increased to the value as shown in Table F-1.

Table F-1: System Minimums

Instrument approach procedure	*Lowest DH/MDH*
ILS/MLS/GLS/SBAS CAT I	200ft (60m) [1]
GNSS (SBAS)	250ft (75m)
GNSS (LNAV/VNAV)	250ft (75m)
Localizer with or without DME	250ft (75m)
SRA (terminating at 1/2NM)	250ft (75m)
SRA (terminating at 1NM)	300ft (90m)
SRA (terminating at 2NM or more)	350ft (105m)
GNSS (LNAV)	250ft (75m)
VOR	300ft (90m)
VOR/DME	250ft (75m)
NDB	350ft (105m)
NDB/DME	300ft (90m)
VDF	350ft (105m)
[1] The lowest authorized DH for CAT I operations is 200ft (60m) unless an equivalent level of safety can be achieved through use of additional procedural or operational requirements.	

VISIBILITY CREDIT FOR ENHANCED VISION SYSTEMS (EVS)

Table G-1: RVR reduction for EVS equipped aircraft

RVR normally required	*RVR for approach utilizing EVS*	*RVR normally required*	*RVR for approach utilizing EVS*
550	350	2700	1800
600	400	2800	1900
650	450	2900	1900
700	450	3000	2000
750	500	3100	2000
800	550	3200	2100
900	600	3300	2200
1000	650	3400	2200
1100	750	3500	2300
1200	800	3600	2400
1300	900	3700	2400
1400	900	3800	2500
1500	1000	3900	2600
1600	1100	4000	2600
1700	1100	4100	2700
1800	1200	4200	2800
1900	1300	4300	2800
2000	1300	4400	2900
2100	1400	4500	3000
2200	1500	4600	3000
2300	1500	4700	3100
2400	1600	4800	3200
2500	1700	4900	3200
2600	1700	5000	3300

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Rule

Visibility credit for EVS is not applied on Jeppesen Standard charts.

COMPARISON OF AOM CONCEPTS

The table below compares AOM concepts which are defined as being “similar” to ICAO Doc 9365 according to Jeppesen AOM rules. The table is intended to make operators aware of the deviations from Doc 9365 to provide guidance to the pilots.

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AERODROME OPERATING MINIMUMS - JEPPESEN

	Condition	ICAO Doc 9365	EASA AIR OPS	India DGCA - CAR	TERPS (CAT C & D only) *(Note 13)*	CAR-OPS (Based on initial version of EU-OPS) *(Note 14)*
Label *(Note 1)*	As determined according to the Jeppesen AOM rules	Std	Std/State	Std/State	TERPS	Std/State
CAT III (ILS, MLS) *(Note 2 & 3)*	**CAT IIIB** Minimum RVR	RVR 75m	RVR 75m	RVR 50m	RVR 300' (75m)	RVR 75m
	CAT IIIB DH vs RVR	DH less than 100': RVR 150m DH less than 50': RVR 125m DH less than 50' or no DH: RVR 75m	DH less than 100': RVR 150m DH less than 50': RVR 125m DH less than 50' or no DH: RVR 75m	DH less than 50' or no DH: RVR less than 175m and not below RVR 50m	No guidance in TERPS (Depends on operator's OpSpecs)	DH less than 100': RVR 150m DH less than 50': RVR 125m DH less than 50' or no DH: RVR 75m
	CAT IIIA Minimum RVR	RVR 175m	RVR 200m (RVR 175m expected in Q4/2020)	RVR 175m	RVR 700' (200m)	RVR 200m
	CAT IIIA DH	Less than 100'	Less than 100'	Less than 100' or no DH	No guidance in TERPS (Depends on operator's OpSpecs)	Less than 100'
CAT II (ILS, MLS, PAR)	Minimum RVR	RVR 300m, CAT D no autoland: RVR 350m	RVR 300m, CAT D no autoland: RVR 350m	RVR 300m, CAT D no autoland: RVR 350m	RVR 1200' (350m)/RVR 1000' (300m)	RVR 300m, CAT D no autoland: RVR 350m
	DH	Less than 200', but not below 100'	Less than 200', but not below 100'	Less than 200', but not below 100'	Less than 200', but not below 100'	Less than 200', but not below 100'
CAT I (ILS, MLS, PAR, GLS, LPV 200') *(Note 4)*	Minimum RVR	RVR 550m	RVR 550m	RVR 550m	RVR 2400' (750m) (RVR 1800'/550m with use of Flight Director or Autopilot or HUD to DA – per FAA Order 8400.13)	RVR 550m
	DH	Not below 200'	Not below 200'	Not below 200'	Not below 200'	Not below 200'

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	Condition	ICAO Doc 9365	EASA AIR OPS	India DGCA - CAR	TERPS (CAT C & D only) *(Note 13)*	CAR-OPS (Based on initial version of EU-OPS) *(Note 14)*
APV (LNAV/VNAV, LPV 250')	Minimum RVR	RVR 750m	RVR 550m	RVR 550m	RVR 2400' (750m)	RVR 600m
	DH	Not below 250'	Not below 250'	Not below 250'	Not below 250'	Not below 250'
NPA (LOC, VOR, NDB, VDF, LNAV, SRA, etc…)	Minimum RVR	RVR 750m	RVR 750m	RVR 750m	RVR 2400' (750m)	RVR 750m
	MDH	250', 300', 350'	250', 300', 350'	250', 300', 350' LNAV = 300'	250', 300', 350'	250', 300', 350' LNAV = 300'
	VNAV DA(H) instead of MDA(H)	Depends on operator	Depends on operator	At **least** 50' add on required	Depends on operator's OpSpecs – OpSpec C073 in FAA Order 8900.1 CHG 238 (Volume 3, Chapter 18, Section 5, Part C)	Depends on operator
	CDFA vs non-CDFA	CDFA recommended, **no** add-on requirement on non-CDFA	CDFA required, otherwise add-on 200m/400m	CDFA required, otherwise add-on 200m/400m	CDFA recommended (FAA Advisory Circular AC 120-108)	CDFA required, otherwise add-on 200m/400m
Circling *(Note 5)*	Minimum VIS	A/B/C/D 1500m/1600m/2400m/ 3600m	A/B/C/D 1500m/1600m/2400m/ 3600m	DGCA approval required	A/B/C/D 1sm/1sm/1.5sm/2sm (1600m/1600m/2400m/ 3200m)	A/B/C/D 1500m/1600m/2400m/ 3600m
	MDH	A/B/C/D 400'/500'/600'/700'	A/B/C/D 400'/500'/600'/700'	DGCA approval required	A/B/C/D 350'/450'/450'/550'	A/B/C/D 400'/500'/600'/700'
SA CAT I *(Note 6)*	**Guidance**	no guidance	no guidance/expected in Q4/2020	no guidance	RA/DH 150' RVR 1400' (Special OpSpec, MSpec, or LoA Approval req & use of HUD to DH – per FAA Order 8400.13D)	no guidance

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	Condition	ICAO Doc 9365	EASA AIR OPS	India DGCA - CAR	TERPS (CAT C & D only) *(Note 13)*	CAR-OPS (Based on initial version of EU-OPS) *(Note 14)*
SA CAT II *(Note 6)*	**Guidance**	no guidance	no guidance/expected in Q4/2020	no guidance	RA/DH 100' RVR 1200' (Special OpSpec, MSpec, or LoA Approval req & use of Autoland or HUD to DH – per FAA Order 8400.13D)	no guidance
LTS CAT I *(Note 7)*	**Guidance**	no guidance	AMC3 SPA.LVO.100	no guidance	no guidance	EASA AIR OPS tables
OTS CAT II *(Note 7)*	**Guidance**	no guidance	AMC4 SPA.LVO.100	no guidance	no guidance	EASA AIR OPS tables
Take-off *(Note 8)*	**Minimum RVR**	RVR 125m, RVR 75m with approved guidance system or HUD/HUDLS	RVR 125m, RVR 75m with approved guidance system or HUD/HUDLS	RVR 125m, RVR 75m with approved guidance system or HUD/HUDLS	RVR 500' (150m), RVR 300' (75m) with approved guidance system or HUD/HUDLS	ABC/D RVR 125m/RVR 150m, RVR 75m with approved guidance system or HUD/HUDLS
Conversion of reported VIS into CMV/RVR *(Note 9)*	**Guidance**	yes	yes	yes	VIS or RVR/VIS minimums published, **no** conversion of reported VIS	yes
Low Visibility Procedures (LVP) *(Note 10)*	**Guidance**	Below RVR 550m (paragraph 3.2.17)	SPA.LVO.115 Below VIS 800m (RVR 550m)	Below RVR 550m/VIS 800m	No specific reference to the term "LVP", but similar procedures in low visibility conditions may exist (SMGCS)	During LTS CAT I, OTS CAT II, CAT II, CAT III and LVTO
Low Visibility Take-off (LVTO) *(Note 11)*	**Guidance**	no guidance (European Regulation only)	AMC1 SPA.LVO.100 Below RVR 400m	Below RVR 400m	no guidance	Below RVR 400m
EVS RVR reduction *(Note 12)*	**Guidance**	Table G-1	AMC6 SPA.LVO.100	No guidance	no guidance	Yes, EASA AIR OPS table

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NOTE 1: "Std" label is used for AOM based purely on ICAO Doc 9365 rules. "Std/State" indicates that there are only a small number of differences to the ICAO Doc 9365 as indicated in the table above. "TERPS" indicates that the minimums are based on TERPS. Operators have to analyze the differences to provide guidance to the pilots.

NOTE 2: Some countries publish a minimum RVR for CAT III only, not for CAT IIIB and/or CAT IIIA. For those countries Jeppesen will not differentiate between CAT IIIB and CAT IIIA. Pilots have to compare the charted RVR against the approved company minimum.

NOTE 3: On some CAT III operations a DH is required. Because the DH depends on several factors which might be operator specific, the operator has to provide guidance to the pilots. A specific DH is only charted if it is published by the State for the applicable CAT III procedure.

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NOTE 4: An LPV might be designed as CAT I or as APV approach procedure. Because of the differences in CAT I and APV minimums, the procedure header in the minimums box will be shown as "LPV CAT I" for European charts. Operators have to provide guidance to the pilots whether the LPV procedures can be flown or not.

NOTE 5: For PANS-OPS and TERPS circling procedures the circling speeds and circling areas are different. Operators have to analyze the differences to provide guidance to the pilots.

NOTE 6: SA CAT I and SA CAT II procedures are mainly published in the United States. Operators need a specific approval and have to provide guidance to the pilots.

NOTE 7: LTS CAT I and OTS CAT II are mainly published in the European Region. Operators need a specific approval and have to provide guidance to the pilots. Currently LTS CAT I minimums are only displayed on tailored charts on customer request. OTS CAT II minimums are only displayed if such a procedure is published in the AIP. EASA plans to remove LTS CAT I and OTS CAT II from the regulation in Q4/2020 and will provide new guidance for SA CAT I and SA CAT II procedures.

NOTE 8: Jeppesen charts will provide the lowest possible minimums for the airport. The normal take-off minimums box will not differentiate between the runways, which may have different runway lighting, unless required because of State-provided minimums. Pilots are reminded that for all take-off minimums below RVR 550m/VIS 800m low visibility procedures might be required. Pilots are also reminded that for take-offs in RVR below 400m a specific approval might be required. Operators which still have an approval according to a CAR-OPS version which is based on earlier EASA AMC/GM (CAT C and D aircraft have different minimums) have to analyze the differences to provide guidance to the pilots.

NOTE 9: The minimums are charted as RVR unless a State provides VIS or CMV values as minimums for the approach procedure. Depending on the available lighting an ATC reported visibility can be converted into a CMV to compare it against a charted RVR/CMV. Whenever a VIS value is charted in the minimums box, an ATC reported visibility must not be converted. An ATC reported RVR can be compared against a charted RVR/CMV.

NOTE 10: It is the operator/pilot responsibility to verify that low visibility procedures (LVP) are in force if they are required. Some States do not use the term "low visibility procedures" or they do not publish the procedures within the AIP. If CAT II/III operations are in progress, then low visibility procedures are in force.

NOTE 11: Operators need a specific approval for low visibility take-off operations and have to provide guidance to the pilots. "Low Visibility Take-off" is only shown in the take-off boxes based on EASA AIR OPS or Indian CAR rules.

NOTE 12: Operators may reduce the required RVR if using an Enhanced Vision System if they are approved for doing this. Jeppesen does not chart EVS RVR minimums.

NOTE 13: The comparison is only valid for CAT C and D aircraft because the harmonized TERPS Table 3-3-1 excludes CAT A and B aircraft.

NOTE 14: The initial version published by EASA (EU-OPS 1) contained the old JAR-OPS take-off minimums, where the lowest RVR for CAT C and D is different (125m vs 150m). The rules from this publication were applied by several State Authorities but not updated with the latest changes on EASA AIR OPS rules. Therefore the take-off minimums are different to the take-off minimums provided in ICAO Doc 9365.

JEPPESEN STANDARD AOM STATE OVERVIEW

The following tables indicate which Aerodrome Operating Minimums (AOM) rules Jeppesen applies for a Country when converting the Aerodrome Operating Minimums to the new Jeppesen AOM Standard.

Even if there is no State AOM concept available for the country, there might be take-off or landing visibilities published for a specific airport or for a specific approach procedure. Such minimums might be published somewhere in AIP, Aerodrome Characteristics pages, Instrument Approach Procedure description or chart (IAP/IAC), Departure Procedure Sources, etc. Therefore, you may see different labels on the same airport, like a **State** label on one chart, while there is a **Std** label on all other charts.

For Military procedures AOM may be published on procedure source, even though there is no AOM concept in place for Civil procedures.

Existing 10-9S pages for EASA AIR OPS operators are kept and updated to allow operators to compare EASA AIR OPS minimums against the minimums based on ICAO Doc 9365. New 10-9S pages are only published if requested by an operator.

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AERODROME OPERATING MINIMUMS - JEPPESEN

Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Afghanistan	OA	State AOM	State, or Military	State or Military minimums on IAP	keep and update
Albania	LA	EASA AIR OPS	Std/State	EU Candidate/EU and/or EASA	---
Algeria	DA	State AOM	State	State AOM on IAC, take-off according AIC 02/01	keep and update
Angola	FN	ICAO	Std, in some cases State	On some IAPs there are visibilities provided	keep and update
Argentina	SA	State AOM	State	IAC and Take-off visibilities per State Regulation	keep and update
Armenia	UD	ICAO	Std	Some minimum visibilities on IAC	keep and update
Ascension Is	FHAW	Military	Military	on IAC	keep and update
Austral Is (French Polynesia)	NT	State AOM	State	on IAC, French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	keep and update
Australia	Y	State AOM	State	On IAC	keep and update
Austria	LO	EASA AIR OPS	Std/State	EU and/or EASA	---
Azerbaijan	UB	ICAO	Std	---	keep and update
Azores	LP	EASA AIR OPS	Std/State	EU and/or EASA	---
Bahamas	MY	State AOM	State	IAC & ENR 1-3-1 (paragraph 3)	keep and update
Bahrain	OB	ICAO	Std	---	keep and update
Bangladesh	VG	Take-off: ICAO Landing: State AOM	Std, or State	Landing: on IAC and AIC 1/01	keep and update

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Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Belarus	UM	Take-off: ICAO Straight-in Landing: ICAO Circling: ICAO or State	Std, or State	Minimum values (= lower limits) for Approach/ Take-off (AD 1.1-1), Circling Minimums according to AD Characteristics	keep and update
Belgium	EB	EASA AIR OPS	Std/State	EU and/or EASA	---
Belize	MZBZ	Take-off: ICAO Landing: State AOM (conventional IAP), ICAO (RNAV)	Std, or State	Landing: partly on IAC (conventional procedures), ceiling may be published on IAC	keep and update
Benin	DB	JAR-OPS	JAR-OPS	on IAC	keep and update
Bermuda	TX	State AOM	State	on IAC and ADC	keep and update
Bhutan	VQ	State AOM	State	on IAC	keep and update
Bolivia	SL	State AOM	State	on IAC	keep and update
Bosnia-Herzegovina	LQ	EASA AIR OPS	Std/State	EASA working arrangement/ technical cooperation	---
Botswana	FB	ICAO	Std	---	keep and update
Brazil	SB	State AOM	State	See IAC	keep and update
Brunei	WB	ICAO	Std	---	keep and update
Bulgaria	LB	EASA AIR OPS	Std/State	EU and/or EASA	---
Burkina Faso	DF	JAR-OPS	JAR-OPS	IAC	keep and update
Burundi	HB	State AOM	State	IAC, ENR 1.5-7 (landing & take-off)	keep and update
Cambodia	VD	ICAO	Std	---	keep and update
Cameroon	FK	JAR-OPS	JAR-OPS	on IAC	keep and update
Canada	C	State AOM	State	on IAC	keep and update
Canary Is	GC	EASA AIR OPS	Std/State	EU and/or EASA	---
Cape Verde	GV	ICAO	Std	---	keep and update
Cayman Is	MW	ICAO	Std	---	keep and update

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Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Central Africa	FE	JAR-OPS	JAR-OPS	on IAC	keep and update
Chad	FT	JAR-OPS	JAR-OPS	on IAC	keep and update
Chile	SC	State AOM	State	Take-off in GEN (2.1), Landing on IAC	keep and update
China, PR of	Z	State AOM	State	on IAC, ADC	create for CAT III airports, other airports on request
Colombia	SK	State AOM	State	Take-off on AD characteristics, Landing on IAC	keep and update
Comoros	FM	JAR-OPS	JAR-OPS	on IAC	keep and update
Congo, DR of	FZ	State AOM	State	on IAC	keep and update
Congo, Republic of	FC	JAR-OPS	JAR-OPS	on IAC	keep and update
Cook Islands	NC	State AOM	State	---	keep and update
Costa Rica	MR	State AOM	State	---	keep and update
Cote d'Ivoire	DI	JAR-OPS	JAR-OPS	on IAC	keep and update
Croatia	LD	EASA AIR OPS	Std/State	EU and/or EASA	---
Cuba	MU	State AOM	State	---	keep and update
Cyprus	LC	EASA AIR OPS	Std/State	EU and/or EASA	---
Czechia	LK	EASA AIR OPS + State AOM	Std/State	EU and/or EASA	---
Denmark	EK	EASA AIR OPS	Std/State	EU and/or EASA	---
Diego Garcia	FJDG	Military	Military	---	keep and update
Djibouti	HD	EASA AIR OPS	Std/State	State AOM on IAC in conformance with EASA AIR OPS	---
Dominica	TD	ICAO	Std	State restriction (minimum VIS) for Circling on IAC	keep and update
Dominican Rep	MD	State AOM	State	---	keep and update
Ecuador	SE	State AOM	State	Take-off on SID, Landing on IAC	keep and update
Egypt	HE	State AOM	State	refer to AD 2.20	keep and update
El Salvador	MS	Take-off: ICAO Landing: State	Std, or State	---	keep and update

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Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Equatorial Guinea	FG	JAR-OPS	JAR-OPS	on IAC	keep and update
Eritrea	HH	ICAO	Std	Some IACs may contain visibilities	keep and update
Estonia	EE	EASA AIR OPS	Std/State	EU and/or EASA	---
Eswatini	FD	ICAO	Std	---	keep and update
Ethiopia	HA	ICAO	Std	---	keep and update
Faroe Is	EKVG	EASA AIR OPS	Std/State	EU and/or EASA, partly higher State AOM (AD characteristics)	---
Fiji Islands	NF	State AOM	State	on IAC	keep and update
Finland	EF	EASA AIR OPS	Std/State	EU and/or EASA	---
France	LF	EASA AIR OPS + State AOM	Std/State	EU and/or EASA, IAC + ADC, AD 1.1, French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	---
French Antilles		EASA AIR OPS + State AOM	Std/State	EU and/or EASA, IAC + ADC, AD 1.1, French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	---
French Guiana	SO	EASA AIR OPS + State AOM	Std/State	EU and/or EASA, IAC + ADC, AD 1.1	---
Futuna Is (French Polynesia)	NL	State AOM	State	on IAC , French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	keep and update
Gabon	FO	JAR-OPS	JAR-OPS	on IAC & ADC	keep and update
Gambia	GB	JAR-OPS	JAR-OPS	on IAC & ADC	keep and update

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Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Gambiers Is (French Polynesia)	NT	State AOM	State	on IAC , French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	keep and update
Georgia	UG	ICAO	Std	---	keep and update
Germany	ED/ET	EASA AIR OPS	Std/State	EU and/or EASA	---
Ghana	DG	ICAO	Std	---	keep and update
Gibraltar	LXGB	EASA AIR OPS	Std/State	EU and/or EASA (civil procedures)	---
Greece	LG	EASA AIR OPS	Std/State	EU and/or EASA	---
Greenland	BG	EASA AIR OPS	Std/State	EU and/or EASA, State values in AD Characteristics	---
Grenada	TG	State AOM	State	AD Characteristics or IAC (conventional), ICAO for RNAV	keep and update
Guadeloupe	TF	EASA AIR OPS + State AOM	Std/State	EU and/or EASA, IAC + ADC, AD 1.1	---
Guatemala	MG	State AOM	State	---	keep and update
Guinea Bissau	GG	JAR-OPS	JAR-OPS	on IAC & ADC	keep and update
Guinea Rep	GU	ICAO	Std	---	keep and update
Guyana	SY	ICAO (SYEC) State AOM (SYCJ)	Std, or State	Partly landing minimums on IAC	keep and update
Haiti	MT	ICAO or State AOM	Std, or State	Partly landing minimums on IAC	keep and update
Honduras	MH	State AOM	State	IAC	keep and update
Hong Kong	VHHH	ICAO	Std	Minimums based on ICAO Doc 9365 and lowest values are published by CAA on form DCA 236	keep and update
Hungary	LH	EASA AIR OPS	Std/State	EU and/or EASA	---
Iceland	BI	EASA AIR OPS	Std/State	EU and/or EASA	---

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Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
India	V	India CAR	Std/State	India CAR, based on ICAO	keep and update (CAT III airports)
Indonesia	WA, WI, WP (Timor Leste / East Timor)	Take-off: ICAO Landing: State AOM	Take-off: Std Landing: State	Landing: IAC	keep and update
Iran	OI	Take-off: State AOM Landing: ICAO	Take-off: State Landing: Std	Take-off: AD 1.1 Landing: ICAO (absolute minimums withdrawn from AIP)	keep and update
Iraq	OR	ICAO or State AOM	Std, or State	on IAC, or no AOM published	keep and update
Ireland	EI	EASA AIR OPS	Std/State	EU and/or EASA	---
Israel	LL	ICAO or State AOM	Std, or State	on IAC/AD Characteristics, or no AOM published	keep and update
Italy	LI	EASA AIR OPS	Std/State	EU and/or EASA	---
Jamaica	MK	State AOM	State	---	keep and update
Japan	RJ	State AOM	State	Japan AIP & IAC, Japanese regulation	keep and update
Jordan	OJ	Take-off: State AOM Landing: ICAO	Take-off: State Landing: Std	Take-off: AD 1.1-5 Landing: ICAO	keep and update
Kazakhstan	UA	ICAO	Std	State provided take-off and landing minimums are removed from AIP	keep and update
Kenya	HK	ICAO	Std	---	keep and update
Kiribati	NG, PL	State AOM	State	---	keep and update
Korea	RK	State AOM	State	Metric or imperial values provided on source	keep and update
Korea, DPR of	ZK	ICAO	Std	---	keep and update
Kosovo	BKPR	Partly State	Std, or State	State minimums on some IAC, otherwise ICAO	keep and update

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Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Kuwait	OK	State AOM	Std/State	Kuwait Civil Aviation Safety Regulation KCASR 6 (Part CAT & Part SPA) The AOM in AD part (1.1-2 to 1.1-4) are not in accordance with the KCASR requirements	---
Kyrgyzstan	UC	ICAO	Std	---	keep and update
Laos	VL	State AOM	State	---	keep and update
Latvia	EV	EASA AIR OPS	Std/State	EU and/or EASA	---
Lebanon	OL	ICAO	Std	---	keep and update
Lesotho	FX	ICAO	Std	---	keep and update
Liberia	GL	ICAO	Std	Exception: GLRB RNAV procedures with State visibility = State label	keep and update
Libya	HL	EASA AIR OPS	Std/State	Libyan CAA adopted EASA AIR OPS AMC and GM	---
Liechtenstein		EASA AIR OPS	Std/State	EU and/or EASA	---
Lithuania	EY	EASA AIR OPS	Std/State	EU and/or EASA	---
Luxembourg	ELLX	EASA AIR OPS	Std/State	EU and/or EASA	---
Macao	VMMC	ICAO, State Take-off minimums	Std, or State	Take-off: ICAO, apply the 175m from ADC as lower limit (R175m instead of R150m). Landing: State	keep and update
Madagascar	FM	JAR-OPS	JAR OPS	on IAC	keep and update
Malawi	FW	ICAO	Std	---	keep and update
Malaysia	WB, WM	ICAO, State Take-off minimums	Std, or State	Take-off minimums per AD 1.1-2	keep and update
Maldives	VR	ICAO	Std	---	keep and update
Mali	GA	JAR-OPS	JAR-OPS	on IAC	keep and update

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Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Malta	LM	EASA AIR OPS	Std/State	EU and/or EASA	---
Marquesas Is (French Polynesia)	NT	State AOM	State	on IAC, French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	keep and update
Martinique	TF	EASA AIR OPS + State AOM	Std/State	EU and/or EASA, IAC + ADC, AD 1.1	---
Mauritania	GQ	JAR-OPS	JAR-OPS	on IAC	keep and update
Mauritius	FI	ICAO	Std	---	keep and update
Mayotte	FMCZ	EASA AIR OPS + State AOM	Std/State	State visibilities on IAC	---
Melilla	GEML	EASA AIR OPS	Std/State	EU and/or EASA	---
Mexico	MM	State AOM	State	on IAC	keep and update
Moldova	LU	ICAO	Std	---	keep and update
Mongolia	ZM	State AOM	State	on IAC, Take-off on ENR 1.3-2	keep and update
Montenegro	LY	State AOM	Std/State	EU Candidate/EU and/or EASA	---
Morocco	GM	ICAO	Std	---	keep and update
Mozambique	FQ	ICAO	Std	---	keep and update
Myanmar	VY	ICAO	Std	---	keep and update
Namibia	FY	State AOM	State	State minimums in ENR 1.8	keep and update
Nepal	VN	ICAO (take-off) or State AOM (IAC)	Std, or State	---	keep and update
Neth Antilles	TN	ICAO	Std	---	keep and update
Netherlands	EH	EASA AIR OPS	Std/State	EU and/or EASA	---
New Caledonia (French Polynesia)	NW	State AOM	State	on IAC, French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	keep and update

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Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
New Zealand and Pacific Islands	NZ	State AOM	State	on IAC For take-off minimums see ENR 1.5-11	keep and update
Nicaragua	MN	State AOM	State	---	keep and update
Niger	DR	JAR-OPS	JAR-OPS	on IAC	keep and update
Nigeria	DN	State AOM based on ICAO AWO	Std or Std/State, or State	Landing: on IAC or AD characteristics, RNAV partly without State provided visibilities Take-off: AD Characteristics, State	keep and update
Niue	NI	State AOM	State	IAC & ADC	keep and update
North Macedonia	LW	EASA AIR OPS	Std/State	EU Candidate/EU and/or EASA	---
Norway	EN	EASA AIR OPS	Std/State	EU and/or EASA	---
Oman	OO	State AOM	Std/State	Take-off: OMAN CAR OPS Landing: State provided minimums (on IAC) are based on Oman CAR OPS.	Add only if requested by a customer
Pakistan	OP	ICAO	Std	Convert from JAR-OPS	keep and update
Palau	PT	TERPS	TERPS	---	---
Panama	MP	State AOM, or ICAO	State, or Std	Landing: on IAC Take-off: on departure procedure, or ICAO Doc 9365	keep and update
Papua New Guinea	AY	State AOM	State	on IAC, Take-off: ENR 1.5-12	keep and update
Paraguay	SG	State AOM	State	---	keep and update
Peru	SP	State AOM	State	---	keep and update
Philippines	RP	partly State AOM for landing	Std, or State	Take-off: ICAO Landing: on IAC or ICAO	keep and update
Poland	EP	EASA AIR OPS	Std/State	EU and/or EASA	---
Portugal	LP	EASA AIR OPS	Std/State	EU and/or EASA	---
Puerto Rico	TJ	TERPS	TERPS	---	---

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AERODROME OPERATING MINIMUMS - JEPPESEN

Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Qatar	OT	QCAR OPS	Std/State	AIP AD 1.1-2 paragraph 4 "Aerodrome Operating Minima" refers to applicable QCAR	---
Reunion	FM	EASA AIR OPS	Std/State	EU and/or EASA	---
Romania	LR	EASA AIR OPS	Std/State	EU and/or EASA	---
Russia	U	ICAO	Std	---	keep and update
Rwanda	HR	State AOM	State	---	keep and update
Samoa	NS	State AOM	State	---	keep and update
Sao Tome and Principe	FP	ICAO	State	---	keep and update
Saudi Arabia	OE	State AOM	State	Take-off: ENR 1.5-1 Landing: IAC	keep and update
Senegal	GO	JAR-OPS	JAR-OPS	on IAC	keep and update
Serbia	LY	EASA AIR OPS	Std/State	EU Candidate/EU and/or EASA	---
Seychelles	FS	EASA AIR OPS	Std/State	SCAA CAD-OPS 38 & 41 (Part CAT & Part SPA)	---
Sierra Leone	GF	ICAO	Std	---	keep and update
Singapore	WS	ICAO	Std	---	keep and update
Slovakia	LZ	EASA AIR OPS & State	Std/State	EU and/or EASA for CAT I approaches (AD 1.1.1.4.3)	---
Slovenia	LJ	EASA AIR OPS	Std/State	EU and/or EASA	---
Society Is (French Polynesia)	NT	State AOM	State	on IAC, French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	keep and update
Solomon Islands	AG	State AOM	State	on IAC	keep and update
Somalia	HC	ICAO	Std	---	keep and update

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AERODROME OPERATING MINIMUMS - JEPPESEN

Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
South African Republic	FA	State AOM	State	State minimums in ENR 1.8 (based on South African Civil Aviation Technical Standards SA-CATS 91)	keep and update
Spain	LE	EASA AIR OPS	Std/State	EU and/or EASA	---
Sri Lanka	VC	ICAO	Std	---	keep and update
St Helena	FHSH	EASA AIR OPS	Std/State	EU and/or EASA	---
St Kitts	TK	State AOM	State	---	keep and update
St Lucia	TL	State AOM	State	---	keep and update
Sudan	HS	ICAO	Std	---	keep and update
Suriname	SM	State AOM	State	---	keep and update
Sweden	ES	EASA AIR OPS	Std/State	EU and/or EASA	---
Switzerland	LS	EASA AIR OPS	Std/State	EU and/or EASA	---
Syria	OS	ICAO	Std	---	keep and update
Taiwan	RC	State AOM	State	---	keep and update
Tajikistan	UT	ICAO	Std	---	keep and update
Tanzania	HT	ICAO	Std	---	keep and update
Thailand	VT	ICAO	Std	---	keep and update
Togo	DX	JAR-OPS	JAR-OPS	on IAC	keep and update
Tonga	NF	State AOM	State	---	keep and update
Trinidad & Tobago	TT	ICAO	Std	---	keep and update
Tuamotu Is (French Polynesia)	NT	State AOM	State	on IAC, French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	keep and update
Tunisia	DT	JAR-OPS	JAR-OPS	---	keep and update

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AERODROME OPERATING MINIMUMS - JEPPESEN

Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Turkiye	LT	EASA AIR OPS	Std/State	EASA working arrangement/ technical cooperation. Turkish SHT-OPS 1 includes the same tables as EASA AIR OPS	---
Turkmenistan	UT	State AOM	State	AIP AD characteristics part	keep and update
Turks and Caicos Is	MB	EASA AIR OPS	Std/State	According to GEN 1.7 AOM have to be determined according to EASA AIR OPS Partly visibilities on IAC	---
Tuvalu	NG	State AOM	State	---	keep and update
Uganda	HU	Take-off: ICAO Landing: State AOM	Std, or State	Visibilities on IAC (At least for HUEN, the published visibilities may be based on Table 6-3 of ICAO Doc 9365)	keep and update
Ukraine	UK	ICAO	Std	---	keep and update
United Arab Emirates	OM	State AOM	Std/State	UAE Civil Aviation Regulations – Air Operations (CAR-AIR OPS) (based on European AMC and GM from EASA AIR OPS)	---
United Kingdom	EG	EASA AIR OPS	Std/State	still based on EASA per AIP (AD 1.1)	---
United States	K, PA (Alaska), PH (Hawaii	TERPS	TERPS	---	---
Uruguay	SU	State AOM	State	On IAC and AD 2.5-11 for SULS	keep and update
Uzbekistan	UT	State AOM	State	On ADC and AD.22	keep and update
Vanuatu	NV	State AOM	State	---	keep and update
Venezuela	SV	State AOM	State	---	keep and update
Vietnam	VV	State AOM	State	---	keep and update

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AERODROME OPERATING MINIMUMS - JEPPESEN

Country	ICAO Code(s)	AOM concept	Minimums Box Label	Additional Information	10–9S handling
Virgin Is	TI	TERPS	TERPS	---	---
Wallis Is (French Polynesia)	NL	State AOM	State	on IAC, French Regulation Recueil Des Criteres Pour La Conception Des Procedures De Vol Aux Instrumentes	keep and update
Yemen	OY	Take-off: ICAO Landing: State AOM	Std, or State	Visibilities on IAC	keep and update
Zambia	FL	ICAO Partly State AOM	Std, or State	Partly visibilities on IAC	keep and update
Zimbabwe	FV	ICAO Partly State AOM	Std, or State	Partly visibilities on IAC	keep and update

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS - EFFECTIVE 30 OCTOBER 2022

General and Aeroplane Specific Material

1 GENERAL

On 5 October 2012 the Commission Regulation (EU) No 965/2012 and related documents were published, laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.

The European Aviation Safety Agency (EASA) publishes Regulations on Air Operations with the associated Decisions containing Acceptable Means of Compliance (AMC) and Guidance Material (GM).

On JEPPESEN approach and airport charts an inverse printed **"Standard"** label in the upper left corner of the minimums band indicates that the minimums are derived according to the requirements described in EASA Air Operations documents.

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From 2020 the **"Standard"** label will be replaced by a **"Std/State"** label to be aligned with the new Jeppesen Standard AOM policy. The label indicates that the minimums are determined according to a State Regulation, which is, in general, similar to the guidance from ICAO Doc 9365.

EASA AIR OPS minimums may be published on minimums listings (indexed as 10-9S, 10-9S1...) if requested by an operator. As the pages are created especially for EASA AIR OPS operators, an inversely printed "EASA AIR OPS" label is depicted in the upper right corner of this page.

TERPS change 20 was harmonized with the EASA Air Ops minimum tables for CAT I, APV and NPA (CAT C and D aircraft only). Those procedures with the TERPS label are therefore EASA AIR OPS compliant for CAT C and D aircraft operators.

The following explanation is an excerpt to summarize only the relevant parts of the EASA Air Operations (EASA Air OPS) regarding the method used to determine Aerodrome Operating Minimums (Rules, AMC or GM). It is **not** intended to provide aircraft or aircrew requirements or operationg procedures.

The publication of EASA Air Ops landing and take-off minimums on Jeppesen charts does not constitute authority for their use by every operator. Each individual operator is responsible for validating that the appropriate approval has been obtained for their use.

In addition, the minimums are only considered applicable if:

- the required ground equipment for the intended procedure is operative; and
- the required aircraft systems for the type of approach are operative; and
- the required aircraft performance criteria are met; and
- the crew is qualified accordingly.

2 TERMINOLOGY AND DEFINITIONS

Acceptable Means of Compliance (AMC) — means non-binding standards adopted by the Agency to illustrate means to establish compliance with Regulation (EC) No 216/2008 and its Implementing Rules.

CAT.OP.MPA.xxx — Implementing rule (IR) from regulation for PART-CAT (Commercial Air Transport Operations)

SPA.LVO.xxx — Implementing rule from regulation for PART-SPA (Specific Approvals)

AMC1 CAT.OP.MPA.xxx — Acceptable Means of Compliance to the related IR CAT.OP.MPA.xxx

GM1 CAT.OP.MPA.xxx — Guidance Material to the related IR CAT.OP.MPA.xxx

Continuous descent final approach (CDFA) — means a technique, consistent with stabilized approach procedures, for flying the final-approach segment (FAS) of an instrument non-precision approach (NPA) procedure as a continuous descent, without level-off, from an altitude/height at or above the final approach fix altitude/height:

(a) for straight-in approach operations, to a point approximately 15m (50ft) above the landing runway threshold or the point where the flare maneuver begins; or

(b) for circling approach operations, until MDA/H or visual flight maneuver altitude/height is reached.

EFVS-A — Enhanced flight vision system used for Approach

EFVS-L — Enhanced flight vision system used for Landing

Instrument approach operations — An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

(a) a two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and

(b) a three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

NOTE 1: Lateral and vertical guidance refers to guidance provided either by ground-based radio navigation aids, or by computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.

NOTE 2: A non-precision approach (NPA) procedure flown as CDFA with vertical path guidance calculated by on-board equipment is considered to be a 3D instrument approach operation.

NOTE 3: CDFAs with manual calculation of the required rate of descent are considered 2D operations.

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS - EFFECTIVE 30 OCTOBER 2022

Low-visibility operations (LVO) — means approach or take-off operations on a runway with a runway visual range less than 550m or with a decision height less than 200ft.

Low-visibility procedures (LVP) — means procedures applied by an aerodrome for the purpose of ensuring safety during low-visibility operations.

NOTE: LVP can be very simple (like simply state that only one operation at the airport is allowed) or can be more complex.

Low-visibility take-off (LVTO) — means a take-off with an RVR less than 550m. Only LVTO operations in an RVR of less than 400m require a specific approval. According AMC2 SPA.LVO.105(c)(b)(7)(ii) LVP are required for LVTOs with RVR less than 400m.

Type A instrument approach operation — means an operation with an MDH or a DH at or above 250ft (Note: According to GM3 CAT.OP.MPA.182(c) the DH of the specific instrument approach procedure determines the Type A or B, not the system minimum. An ILS with a DH >=250ft is always a Type A operation.)

Type B instrument approach operation — means an operation with a DH below 250ft

Type of instrument approach operation on Jeppesen charts for States applying EASA AIR OPS

Approach Type	Flight Technique	Descent Limit Label	Type of Operation
Precision	---	DA(H	3D, type A or B
APV	---	DA(H	3D, type A
Non-precision	CDFA *(onboard equipment)* Descent angle depicted	DA/MDA(H)	3D, type A
Non-precision	CDFA *(manual calculation)* No Descent angle depicted	DA/MDA(H) or MDA(H)	2D, type A
Non-precision	Other than CDFA	MDA(H)	2D, type A

NOTE: According to Table 10 from AMC5 CAT.OP.MPA.110 operating 2D or 3D is a contributing factor to determine the lowest RVR.

Flying the level segment up to the missed approach point or not flying a level segment determines whether an RVR add-on (200m or 400m) is required or not.

3 OPERATOR RESPONSIBILITY

CAT.OP.MPA.110 Aerodrome operating minimums

a. The operator shall establish aerodrome operating minimums for each departure, destination or alternate aerodrome that is planned to be used in order to ensure separation of the aircraft from terrain and obstacles and to mitigate the risk of loss of visual references during the visual flight segment of instrument approach operations.

b. The method used to establish aerodrome operating minimums shall take all the following elements into account:
   1. the type, performance, and handling characteristics of the aircraft;
   2. the equipment available on the aircraft for the purpose of navigation, acquisition of visual references, and/or control of the flight path during take-off, approach, landing, and the missed approach;
   3. any conditions or limitations stated in the aircraft flight manual (AFM);
   4. the relevant operational experience of the operator;
   5. the dimensions and characteristics of the runways/final approach and take-off areas (FATOs) that may be selected for use;
   6. the adequacy and performance of the available visual and non-visual aids and infrastructure;
   7. the obstacle clearance altitude/height (OCA/H) for the instrument approach procedures (IAPs);
   8. the obstacles in the climb-out areas and necessary clearance margins;
   9. the composition of the flight crew, their competence and experience;
   10. the IAP;
   11. the aerodrome characteristics and the available air navigation services (ANS);
   12. any minimums that may be promulgated by the State of the aerodrome;
   13. the conditions prescribed in the operations specifications including any specific approvals for low-visibility operations (LVOs) or operations with operational credits;
   14. any non-standard characteristics of the aerodrome, the IAP or the environment.

c. The operator shall specify a method of determining aerodrome operating minimums in the operations manual.

d. The method used by the operator to establish aerodrome operating minimums and any change to that method shall be approved by the competent authority.

GM6 CAT.OP.MPA.110 Aerodrome operating minimums

INCREMENTS SPECIFIED BY THE COMPETENT AUTHORITY

Additional increments to the published minimums may be specified by the competent authority to take into account certain operations, such as downwind approaches and single-pilot operations or approaches flown not using the CDFA technique.

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS - EFFECTIVE 30 OCTOBER 2022

GM7 CAT.OP.MPA.110 Aerodrome operating minimums

USE OF COMMERCIALLY AVAILABLE INFORMATION

When an operator uses commercially available information to establish aerodrome operating minimums, the operator remains responsible for ensuring that the material used is accurate and suitable for its operation, and that aerodrome operating minimums are calculated in accordance with the method specified in Part C of its operations manual and approved by the competent authority. The procedures in ORO.GEN.205 'Contracted activities' apply in this case.

GM8 CAT.OP.MPA.110 Aerodrome operating minimums

LOW TEMPERATURE CORRECTION

a. An operator may determine the aerodrome temperature below which a correction should be applied to the DA/H.
b. Table 20 may be used to determine the correction that should be applied.
c. The calculations in the table are for a sea-level aerodrome; they are therefore conservative when applied at higher-level aerodromes.
d. Guidance on accurate corrections for specific conditions (if required) is available in PANS-OPS, Volume I (ICAO Doc 8168) Section 1 Chapter 4.

GM8 CAT.OP.MPA 110 Table 20 - Temperature corrections to be applied to barometric DH/MDH

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Aerodrome temperature (°C)	Height above the elevation of the altimeter setting source (ft)													
	200	300	400	500	600	700	800	900	1000	1500	2000	3000	4000	5000
0	20	20	30	30	40	40	50	50	60	90	120	170	230	280
-10	20	30	40	50	60	70	80	90	100	150	200	290	390	490
-20	30	50	60	70	90	100	120	130	140	210	280	420	570	710
-30	40	60	80	100	120	140	150	170	190	280	380	570	760	950
-40	50	80	100	120	150	170	190	220	240	360	480	720	970	1210
-50	60	90	120	150	180	210	240	270	300	450	590	890	1190	1500

SPA.LVO.110 Aerodrome-related requirements, including instrument flight procedures

The operator shall ensure that only aerodromes, including instrument flight procedures, suitable for the intended operations are used for LVOs and operations with operational credits.

AMC4 SPA.LVO.110 Aerodrome-related requirements, including instrument flight procedures

COLLECT AND DEVELOP AIRPORT DATA NOT CONTAINED IN THE AIP — AEROPLANES

When the operator wishing to use an aerodrome where its relevant data for the purpose of LVO is not provided or some data is not provided, the operator should develop procedures to collect or develop the necessary data. The procedure should be specific to the State of the aerodrome or the area of operation and should be approved by competent authority.

4 APPROACH FLIGHT TECHNIQUE

CAT.OP.MPA.115 Approach flight technique - aeroplanes

a. All approach operations shall be flown as stabilized approach operations unless otherwise approved by the competent authority for a particular approach to a particular runway.
b. The continuous descent final approach (CDFA) technique shall be used for approach operations using non-precision approach (NPA) procedures except for such particular runways for which the competent authority has approved another flight technique.

5 MET VISIBILITY/RVR/CMV

AMC10 CAT.OP.MPA.110 Aerodrome operating minimums

CONVERSION OF VISIBILITY TO CMV – AEROPLANES

The following conditions apply to the use of converted meteorological visibility (CMV) instead of RVR:

a. If the reported RVR is not available, a CMV may be substituted for the RVR, except:
   1. to satisfy the take-off minimums; or
   2. for the purpose of continuation of an approach in LVOs.
b. If the minimum RVR for an approach is more than the maximum value assessed by the aerodrome operator, then CMV should be used.
c. In order to determine CMV from visibility:
   1. for flight planning purposes, a factor of 1.0 should be used.
   2. for purposes other than flight planning, the conversion factors specified in Table 16 should be used.

AMC10 CAT.OP.MPA.110 Table 16 Conversion of reported VIS to RVR/CMV

Light elements in operation	RVR/CMV = reported VIS x factor	
	Day	Night
High intensity approach and runway lights	1.5	2.0
Any type of light installation other than above	1.0	1.5
No lights	1.0	Not applicable

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS - EFFECTIVE 30 OCTOBER 2022

6 APPROACH LIGHTING SYSTEMS

AMC5 CAT.OP.MPA.110 Aerodrome operating minimums

APPROACH LIGHTING SYSTEMS

AMC5 CAT.OP.MPA.110 Table 11 Approach lighting systems - Aeroplanes

Class of lighting facility	Length, configuration and intensity of approach lights
FALS	CAT I approach lighting system (HIALS ≥ 720m) distance coded centerline, Barrette centerline
IALS	Simple approach lighting system (HIALS 420-719m) single source, Barrette
BALS	Any other approach lighting system (HIALS or MIALS or ALS 210-419m)
NALS	Any other approach lighting system (HIALS, MIALS or ALS < 210m) or no approach lights

7 DETERMINATION OF AOM FOR TAKE-OFF

AMC1 CAT.OP.MPA.110 Aerodrome operating minimums

TAKE-OFF OPERATIONS - AEROPLANES

a. Take-off minimums

Take-off minimums should be expressed as visibility (VIS) or runway visual range (RVR) limits, taking into account all relevant factors for each runway planned to be used and aircraft characteristics and equipment. Where there is a specific need to see and avoid obstacles on departure and/or for a forced landing, additional conditions, e.g. ceiling, should be specified.

b. Visual reference

2. For night operations, the prescribed runway lights should be in operation.

c. Required RVR or VIS

1. For multi-engined aeroplanes, with performance such that, in the event of a critical engine failure at any point during take-off, the aeroplane can either stop or continue the take-off to a height of 1500ft above the aerodrome while clearing obstacles by the required margins, the take-off minimums specified by the operator should be expressed as RVR or VIS values not lower than those specified in Table 1.
2. For multi-engined aeroplanes without the performance to comply with the conditions in c.1., in the event of a critical engine failure, there may be a need to re-land immediately and to see and avoid obstacles in the take-off area. Such aeroplanes may be operated to the following take-off minimums provided that they are able to comply with the applicable obstacle clearance criteria, assuming engine failure at the height specified. The take-off minimum specified by the operator should be based upon the height from which the one-engine-inoperative (OEI) net take-off flight path can be constructed. The RVR minimum used should not be lower than either of the values specified in Table 1 or Table 2.

AMC1 CAT.OP.MPA.110 Table 1 Take-off - Aeroplanes (without LVTO Approval) RVR or VIS

Facilities		Minimum RVR or VIS
Day	NIL	500m
Day	Centerline markings (RCLM) **or** Runway edge lights (RL) **or** Runway centerline lights (CL)	400m
Night	Runway end lights **and** Runway edge lights (RL) **or** Runway centerline lights (CL)	

Notes:

– The reported RVR or VIS value representative of the initial part of the take-off run can be replaced by pilot assessment.

– During day with NIL facilities: The pilot is able to continuously identify the take-off surface and maintain directional control.

– During night: Runway end lights may be substituted by color-coded runway edge lights or color-coded runway centerline lights.

AMC1 CAT.OP.MPA.110 Table 2 Take-off - Aeroplanes (without LVTO approval) Assumed engine failure height above the runway versus RVR or VIS

Assumed Engine Failure Height above the Take-off Runway	RVR or VIS
≤ 50ft	400m
51ft-100ft	400m
101ft-150ft	400m
151ft-200ft	500m
201ft-300ft	1000m
More than 300ft or if no positive take-off flight path can be constructed	1500m

NOTE: The reported RVR or VIS value representative of the initial part of the take-off run can be replaced by pilot assessment.

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS - EFFECTIVE 30 OCTOBER 2022

SPA.LVO.100 Low visibility operations

The operator shall conduct the following operations only if they are approved by the competent authority:

a. take-off operations with visibility conditions of less than 400m RVR;

GM2 SPA.LVO.100 Low-visibility operations and operations with operational credits

LOW-VISIBILITY CONDITIONS

a. Low-visibility conditions means meteorological conditions with a runway visual range (RVR) less than 550m.

GM1 SPA.LVO.100(a) Low-visibility operations and operations with operational credits

CLASSIFICATION OF LVTO OPERATIONS

Take-off operations are classified as 'normal take-off operations' with an RVR at or above 550m and 'LVTO operations' with an RVR below 550m. Only LVTO operations in an RVR of less than 400m require a specific approval.

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AMC1 SPA.LVO.100(a) Low-visibility operations and operations with operational credits

LOW-VISIBILITY TAKE-OFF (LVTO) OPERATIONS – AEROPLANES IN AN RVR of LESS THAN 400m

a. Required RVR

1. For multi-engined aeroplanes which, in the event of a critical engine failure at any point during take-off, can either stop or continue the take-off to a height of 1500ft above the aerodrome while clearing obstacles by the required margins, the criteria in Table 1 should apply:

AMC1 SPA.LVO.100(a) Table 1 LVTO Operations with aeroplanes - RVR versus facilities

Facilities	Minimum RVR
Centerline markings (RCLM) **and** Runway edge lights (RL)	300m (day)
Centerline markings (RCLM) **and** Runway edge lights (RL) **and** Runway end lights or Runway centerline lights (CL)	300m (night)
Centerline markings (RCLM) **and** Runway end lights **and** Runway edge lights (RL) **and** Runway centerline lights (CL)	150m
Centerline markings (RCLM) **and** Runway end lights **and** Runway edge lights (RL) (spaced 60m or less) **and** Runway centerline lights (CL) (spaced 15m or less)	125m

2. For multi-engined aeroplanes not complying with the conditions in (a)(1), there may be a need to land immediately and to see and avoid obstacles. Such aeroplanes may be operated to the take-off minimums shown in Table 2 and the marking and lighting criteria shown in Table 1, provided that they are able to comply with the applicable obstacle clearance criteria, assuming engine failure at the height specified:

AMC1 SPA.LVO.100(a) Table 2 LVTO operations with aeroplanes - Assumed engine failure height versus RVR

Assumed engine failure height above the take-off runway (ft) vs RVR (m)	
Height	**RVR**
Less than 50ft	Not less than 200m
More than 50ft but less than 100ft	Not less than 300m

b. The reported RVR value representative of the initial part of the take-off run can be replaced by pilot assessment.

c. The minimum RVR value specified in Table 1 or 2 should be achieved for all reporting points representative of the parts of the runway from the point at which the aircraft commences the take-off until the calculated accelerate-stop distance from that point.

LVTO-OPERATIONS – AEROPLANES IN AN RVR OF LESS THAN 125m

d. For LVTO operations with an RVR of less than 125m, the following additional elements should apply:

1. The runway has centerline lights spaced at intervals of 15m or less;
2. If an ILS signal is used for lateral guidance, the ILS localizer signal meets the requirements for category III operations, unless otherwise stated in the AFM;

e. For LVTO operations with an RVR of less than 125m, the reported RVR should be not less than the minimum specified in the AFM or, if no such minimum is specified, not less than 75m.

f. The minimum required RVR should be achieved for all reporting points representative of the parts of the runway from the point at which the aircraft commences the take-off until the greater of the calculated take-off distance or accelerate-stop distance from that point.

g. The reported RVR value representative of the initial part of the take-off run can be replaced by pilot assessment.

8 DETERMINATION OF AOM FOR CIRCLING

AMC7 CAT.OP.MPA.110 Aerodrome operating minimums

CIRCLING OPERATIONS - AEROPLANES

a. Circling Minimums

The following standards should apply for establishing circling minimums for operations with aeroplanes:

1. The MDH for circling operation should not be lower than the highest of:

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i. the published circling OCH for the aeroplane category;
ii. the minimum circling height derived from Table 15; or
iii. the DH/MDH of the preceding instrument approach procedure (IAP);

2. The MDA for circling should be calculated by adding the published aerodrome elevation to the MDH, as determined by (a).(1).; and
3. The minimum VIS for circling should be the higher of:
   i. the circling VIS for the aeroplane category, if published; or
   ii. the minimum VIS derived from Table 15.

AMC7 CAT.OP.MPA.110 Table 15 Circling - Aeroplanes MDH and minimum VIS versus aeroplane category

	Aeroplane Category			
	A	B	C	D
MDH	400ft	500ft	600ft	700ft
VIS	1500m	1600m	2400m	3600m

b. Conduct of flight - general
   1. the MDH and OCH included in the procedure are referenced to aerodrome elevation;
   2. the MDA is referenced to mean sea level;
   3. for these procedures, the applicable visibility is the VIS; and
   4. operators should provide tabular guidance of the relationship between height above threshold and the in-flight visibility required to obtain and sustain visual conduct during the circling maneuver.

9 VISUAL APPROACH OPERATIONS

AMC9 CAT.OP.MPA.110 Aerodrome operating minimums

VISUAL APPROACH OPERATIONS

The operator should not use an RVR of less than 800m for a visual approach operation.

10 DETERMINATION OF AOM FOR INSTRUMENT APPROACH OPERATIONS

AMC3 CAT.OP.MPA.110 Aerodrome operating minimums

DETERMINATION OF DH/MDH FOR INSTRUMENT APPROACH OPERATIONS - AEROPLANES

a. The decision height (DH) to be used for a 3D approach operation or a 2D approach operation flown using the continuous descent final approach (CDFA) technique should not be lower than the highest of:
   1. the obstacle clearance height (OCH) for the category of the aircraft;
   2. the published approach procedure DH or minimum descent height (MDH) where applicable;
   3. the system minimum specified in Table 4;
   4. the minimum DH permitted for the runway specified in Table 5; or
   5. the minimum DH specified in the aircraft flight manual (AFM) or equivalent document, if stated.
b. The MDH for a 2D approach operation flown not using the CDFA technique should not be lower than the highest of:
   1. the OCH for the category of aircraft;
   2. the published approach procedure MDH where applicable;
   3. the system minimum specified in Table 4;
   4. the lowest MDH permitted for the runway specified in Table 5; or
   5. the lowest MDH specified in the AFM, if stated.

AMC3 CAT.OP.MPA.110 Table 4 System minimums - Aeroplanes

Facility	Lowest DH/MDH
ILS/MLS/GLS/PAR GNSS/SBAS (LPV)	200ft
GNSS/SBAS (LP) GNSS (LNAV) GNSS/Baro-VNAV (LNAV/VNAV) LOC with or without DME SRA (terminating at 0.5NM) VOR/DME	250ft
SRA (terminating at 1.0NM) VOR NDB/DME	300ft
SRA (terminating at 2.0NM or more) NDB VDF	350ft

Localizer performance with vertical guidance (LPV): a DH of 200ft may be used only if the published FAS datablock sets a vertical alert limit not exceeding 35m. Otherwise, the DH should not be lower than 250ft.

GM3 CAT.OP.MPA.110 Aerodrome operating minimums

SBAS OPERATIONS

a. SBAS LPV operations with a DH of 200ft depend on an SBAS system approved for operations down to a DH of 200ft.

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AMC3 CAT.OP.MPA.110 Table 5 Type of Runway versus minimum RVR or VIS - Aeroplanes

Runway type		Lowest DH/MDH
Instrument Runway	(CAT I) Precision approach (PA) runway	200ft
	NPA runway	250ft
Non-Instrument Runway	Non-instrument Runway	Circling minimums as shown in Table 15 (circling minimums)

c. Where a barometric DA/H or MDA/H is used, this should be adjusted where the ambient temperature is significantly below international standard atmosphere (ISA). GM8 CAT.OP.MPA.110 'Low temperature correction' provides a cold temperature correction table for adjustment of minimum promulgated heights/altitudes.

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AMC5 CAT.OP.MPA.110 Aerodrome operating minimums

DETERMINATION OF RVR OR VIS FOR INSTRUMENT APPROACH OPERATIONS - AEROPLANES

a. The RVR or VIS for straight-in instrument approach operations should be not less than the greatest of:
   1. the minimum RVR or VIS for the type of runway used according to Table 8;
   2. the minimum RVR determined according to the MDH or DH and class of lighting facility according to Table 9; or
   3. the minimum RVR according to the visual and non-visual aids and on-board equipment used according to Table 10.

   If the value determined in (1) is a VIS, then the result is a minimum VIS. In all other cases, the result is a minimum RVR.

b. For Category A and B aeroplanes, if the RVR or VIS determined in accordance with (a) is greater than 1500m, then 1500m should be used.

c. If the approach is flown with a level flight segment at or above the MDA/H, then 200m should be added to the RVR calculated in accordance with (a) and (b) for Category A and B aeroplanes and 400m for Category C and D aeroplanes.

d. The visual aids should comprise standard runway day markings, runway edge lights, threshold lights, runway end lights and approach lights as defined in Table 11.

AMC5 CAT.OP.MPA.110 Table 8 Runway Type Minimums - Aeroplanes

Type of runway	Minimum RVR or VIS
PA runway CAT I	RVR 550m
NPA runway	RVR 750m
Non-instrument runway	VIS according to Table 15 (circling minimums)

AMC5 CAT.OP.MPA.110 Table 9 RVR versus DH/MDH - Aeroplanes

DH or MDH (ft)	Class of lighting facilities			
	FALS	IALS	BALS	NALS
	RVR (m)			
200 - 210	550	750	1000	1200
211 - 240	550	800	1000	1200
241 - 250	550	800	1000	1300
251 - 260	600	800	1100	1300
261 - 280	600	900	1100	1300
281 - 300	650	900	1200	1400
301 - 320	700	1000	1200	1400
321 - 340	800	1100	1300	1500
341 - 360	900	1200	1400	1600
361 - 380	1000	1300	1500	1700
381 - 400	1100	1400	1600	1800
401 - 420	1200	1500	1700	1900
421 - 440	1300	1600	1800	2000
441 - 460	1400	1700	1900	2100
461 - 480	1500	1800	2000	2200
481 - 500	1500	1800	2100	2300
501 - 520	1600	1900	2100	2400
521 - 540	1700	2000	2200	2400
541 - 560	1800	2100	2300	2400
561 - 580	1900	2200	2400	2400
581 - 600	2000	2300	2400	2400
601 - 620	2100	2400	2400	2400

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AMC5 CAT.OP.MPA.110 Table 9 RVR versus DH/MDH - Aeroplanes (continued)

DH or MDH (ft)	Class of lighting facilities			
	FALS	IALS	BALS	NALS
	RVR (m)			
621 - 640	2200	2400	2400	2400
641 - 660	2300	2400	2400	2400
661 and above	2400	2400	2400	2400

AMC5 CAT.OP.MPA.110 Table 10 Visual and non-visual aids and/or on-board-equipment versus minimum RVR - Aeroplanes

Type of approach	Facilities	Lowest RVR Multi-pilot operations	Lowest RVR Single-pilot operations
3D operations (Final approach track offset =<15° for CAT A and B aeroplanes or =<5° for CAT C and D aeroplanes)	Runway touchdown zone lights (TDZ) and runway centerline lights (CL)	No limitation	No limitation
	Without TDZ and/or CL but using HUDLS or equivalent system, autopilot or flight director to the DH	No limitation	600m
	No TDZ and/or CL, not using HUDLS or equivalent system, autopilot or flight director to the DH	750m	800m
3D operations (Final approach track offset >15° for CAT A and B aeroplanes or final approach track offset >5° for CAT C and D aeroplanes)	Runway touchdown zone lights (TDZ) and runway centerline lights (CL)	800	1000m
3D operations (Final approach track offset >15° for CAT A and B aeroplanes or final approach track offset >5° for CAT C and D aeroplanes)	Without TDZ and/or CL but using HUDLS or equivalent system, autopilot or flight director to the DH	800m	1000m
2D operations	Final approach track offset =<15° for CAT A and B aeroplanes or =<5° for CAT C and D aeroplanes	750m	800m
	Final approach track offset >15° for CAT A and B aeroplanes	1000m	1000m
	Final approach track offset >5° for CAT C and D aeroplanes	1200m	1200m

e. For night operations or for any operation where credit for visual aids required, the lights should be on and serviceable except as provided for in Table 17.

f. Where any visual or non-visual aid specified for the approach and assumed to be available in the determination of operating minimum is unavailable, revised operating minimum will need to be determined.

11 LOW-VISIBILITY OPERATIONS AND OPERATIONS WITH OPERATIONAL CREDITS

GM1 SPA.LVO.100(b) Low-visibility operations and operations with operational credits

INSTRUMENT APPROACH OPERATIONS IN LOW-VISIBILITY CONDITIONS - CLASSIFICATION OF STANDARD APPROACH OPERATIONS

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The different types of approach and landing operations are classified according to the lowest DH (or MDH) and RVR applicable to the approach type. The classification of approach types does not depend on the technology used for the approach.

The lowest minimums specified do not take account of 'operational credits' that may allow for lower operating minimums.

The classification does not subdivide CAT III operations into CAT IIIA, IIIB, and IIIC. The actual minimums applicable to any operation depends on the aircraft equipment and the specific LVO approval held by the air operator.

The AFM for aircraft certified for CAT III operations will state the lowest usable DH, or no DH. Some AFMs may refer to the previous ICAO classification as follows:

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– CAT IIIA: a DH lower than 100ft or no DH and an RVR not less than 175m;
– CAT IIIB: a DH lower than 50ft or no DH and an RVR less than 175m but not less than 50m.

The minimum RVR in the EU regulations is 75m.

Where an operational credit allows operation to lower-than-standard minimums, this is not considered a separate approach classification.

GM2 SPA.LVO.100(b) Low-visibility operations and operations with operational credits

Legacy systems may be described as capable of 'CAT 3A' or 'CAT IIIA' operations. This implies a minimum DH of less than 100ft but not less than 50ft. Systems described as capable of 'CAT 3B' or 'CAT IIIB' may be certified for a DH of less than 50ft or no DH.

Operations to a DH of less than 100ft but not less than 50ft will typically require a fail-passive automatic landing system or a HUDLS or equivalent system.

Operations to a DH of less than 50ft will require a fail-operational landing system, a fail-passive go-around system, automatic thrust control and either automatic ground roll control or ground roll guidance using a HUDLS.

For no DH operations, a fail-passive or fail-operational ground roll control system is required.

The RVR required for SA CAT I, CAT II and SA CAT II approach operations is determined by the DH and the aircraft approach speed category.

The RVR required for CAT III approach operations is determined by the DH and the capability of the ground-roll control system. Operations with fail-passive roll control systems require a greater RVR than operations with fail-operational ground control systems because the pilots would need to have sufficient visibility to maintain lateral control in the event of a system failure.

12 DETERMINATION OF AOM FOR STANDARD CAT II OPERATIONS

AMC1 SPA.LVO.100(b) Low-visibility operations and operations with operational credits

INSTRUMENT APPROACH OPERATIONS IN LOW-VISIBILITY CONDITIONS - CAT II OPERATIONS

For CAT II operations, the following should apply:

a. The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance and be not lower than the highest of:
   1. the minimum DH specified in the AFM, if stated;
   2. the applicable obstacle clearance height (OCH) for the category of aircraft;
   3. the DH to which the flight crew is qualified to operate; or
   4. 100ft.
b. The lowest RVR minimums to be used are specified in Table 4:

AMC1 SPA.LVO.100(b) Table 4 - CAT II operations minimums: RVR (m) versus DH (ft)

Aircraft categories		Auto-coupled or HUD to below DH*	
		A, B, C	D
DH (ft)	100-120	300	300/350*
	121-140	400	400
	141-199	450	450

An RVR of 300m may be used for CAT D aeroplane conducting an autoland or using a HUDLS to touchdown.

13 DETERMINATION OF AOM FOR CAT III OPERATIONS

AMC2 SPA.LVO.100(b) Low-visibility operations and operations with operational credits

INSTRUMENT APPROACH OPERATIONS IN LOW-VISIBILITY CONDITIONS – CAT III OPERATIONS

For CAT III operations, the following should apply:

a. For operations in which a DH is used, the DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance and be not lower than:
   1. the minimum DH specified in the AFM, if stated;
   2. the DH to which the flight crew is qualified to operate.
b. Operations with no DH should only be conducted if:
   1. operation with no DH is specified in the AFM;
   2. there is no published information indicating that the approach aid or aerodrome facilities cannot support operations with no DH; and
   3. the flight crew is qualified to operate with no DH.
c. The lowest RVR to be used should be determined in accordance with Table 5:

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AMC2 SPA.LVO.100(b) Table 5 - CAT III operation minimums: RVR (m) versus DH (ft)

DH (ft)	Roll-out control/ guidance system	RVR (m)
50-99	Not required	175
0-49 or no DH	Fail-passive	125
	Fail-operational	75

For a fail-passive or HUD roll-out control system, a lower RVR value (no lower than 75 m) can be used if stated in the AFM provided that the equipment demonstrated such capability as part of the certification process. This is provided that the operator has implemented the appropriate operating procedures and training.

14 OPERATIONS WITH OPERATIONAL CREDITS

GM1 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

THE CONCEPT OF OPERATIONS WITH OPERATIONAL CREDITS

For each specific class of standard take-off or approach operations, a standard combination of airborne equipment, aerodrome infrastructure and equipment, and procedures (system components) needs to be available to ensure the required performance of the total system.

System components may exceed the required standard performance. The aim of the concept of operations with operational credits is to exploit such enhanced performance to provide operational flexibility beyond the limits of standard operations.

For approach operations, an operational credit can be applied to the instrument or the visual segment or both.

Where an operational credit allows operation to lower-than-standard minimums, this is not considered a separate approach classification.

GM2 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

OPERATIONS WITH OPERATIONAL CREDITS – SPECIAL AUTHORISATION CATEGORY I (SA CAT I) OPERATIONS

SA CAT I is an operational credit that exploits a navigation solution with superior performance to that required for standard CAT I by extending the instrument segment of CAT I approach operations. This navigation solution may be an ILS installation with the necessary performance coupled to a suitably certified autoland system or a HUD or equivalent display system or SVGS. The extended instrument segment means that the DH can be reduced from the standard minimum of 200ft down to 150ft. The lower DH allows a corresponding reduction in the RVR required for the approach.

AMC1 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

OPERATIONS WITH OPERATIONAL CREDITS – SPECIAL AUTHORISATION CATEGORY I (SA CAT I)

For special authorisation category I (SA CAT I) operations, the following should apply:

a. The DH of an SA CAT I operation should not be lower than the highest of:
   1. the minimum DH specified in the AFM, if stated;
   2. the applicable OCH for the category of aeroplane;
   3. the DH to which the flight crew is qualified to operate; or
   4. 150ft.
b. Where the DH for an SA CAT I operation is less than 200ft, it should be determined by the use of a radio altimeter or other device capable of providing equivalent performance.
c. The following visual aids should be available:
   1. approach lights as specified in Table 8;
   2. precision approach (PA) runway markings;
   3. category I runway lights.
d. The lowest RVR should not be lower than the higher of:
   1. the minimum RVR specified in the AFM, if stated; or
   2. the RVR specified in Table 8.

AMC1 SPA.LVO.100(c) Table 8 SA CAT I operation minimums RVR (m) versus approach lighting system

Class of light facility		FALS	IALS	BALS	NALS
DH (ft)	150 - 160	400	500	600	700
	161 - 200	450	550	650	750
	201 - 210	450	550	650	750
	211 - 220	500	550	650	800
	221 - 230	500	600	700	900
	231 - 240	500	650	750	1000
	241 - 249	550	700	800	1100

GM3 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

OPERATIONS WITH OPERATIONAL CREDITS – SPECIAL AUTHORISATION CATEGORY II (SA CAT II) OPERATIONS

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SA CAT II is an operational credit that applies to the visual segment of an approach conducted where aerodrome, runway and approach lighting systems do not meet the usual requirements for a CAT II precision lighting system. SA CAT II exploits the performance of a suitably certified HUDLS or autoland system. The DH will be the same as for standard CAT II, and the required RVR will depend on the class of light facility installed.

AMC2 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

OPERATIONS WITH OPERATIONAL CREDITS – SPECIAL AUTHORISATION CATEGORY II (SA CAT II)

For special authorization category II (SA CAT II) operations, the following should apply:

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a. The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process, and be not lower than the highest of:
   1. the minimum DH specified in the AFM, if stated;
   2. the applicable OCH for the category of aeroplane;
   3. the DH to which the flight crew is qualified to operate; or
   4. 100ft.
b. The following visual aids should be available:
   1. approach lights as specified in Table 9;
   2. precision approach runway markings;
   3. category I runway lights.
c. The lowest RVR minimums to be used are specified in Table 9:

AMC2 SPA.LVO.100(c) Table 9 SA CAT II operation minimums RVR (m) versus DH (ft)

Class of light facility		FALS	IALS	BALS	NALS
DH (ft)	100 - 120	350	450	600	700
	121 - 140	400	500	600	700
	141 - 160	400	500	600	750
	161 - 199	400	550	650	750

AMC3 SPA.LVO.110 Aerodrome-related requirements, including instrument flight procedures

SUITABLE AERODROMES — RUNWAY AND RUNWAY ENVIRONMENT — NAVIGATION FACILITIES — APPROACH OPERATIONS OTHER THAN EFVS OPERATIONS

(d) For SA CAT II operations:
   (4) the following visual aids should be available:
      (ii) for operations with an RVR of less than 400m, centerline lights.

15 FAILED OR DOWNGRADED EQUIPMENT

AMC11 CAT.OP.MPA.110 Aerodrome Operating minimums

EFFECT ON LANDING MINIMUMS OF TEMPORARILY FAILED OR DOWNGRADED GROUND EQUIPMENT

a. General:

These instructions are intended for use both before and during flight. It is, however, not expected that the commander would consult such instructions after passing 1000ft above the aerodrome. If failures of ground aids are announced at such a late stage, the approach could be continued at the commander's discretion. If failures are announced before such a late stage in the approach, their effect on the approach should be considered as described in Table 17, and the approach may have to be abandoned.

b. Conditions applicable to Table 17:
   1. multiple failures of runway/FATO lights other than those indicated in Table 17 should not be acceptable;
   2. failures of approach and runway/FATO lights are acceptable at the same time, and the most demanding consequence should be applied; and
   3. failures other than ILS, GLS, MLS affect the RVR only and not the DH.

AMC11 CAT.OP.MPA.110 Table 17 Failed or downgraded equipment - Effect on landing minimums operations without LVO approval

Failed or downgraded equipment	Effect on landing minimums	
	Type B	Type A
Navaid stand-by transmitter	No effect	No effect
Outer marker (ILS only)	Not allowed, except if the required height versus glide path can be checked using other means, e.g. DME fix	APV - not applicable
		NPA with final approach fix (FAF): no effect unless used as FAF
		If the FAF cannot be identified (e.g. no method available for timing of descent), NPA operations cannot be conducted

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AMC11 CAT.OP.MPA.110 Table 17 Failed or downgraded equipment - Effect on landing minimums operations without LVO approval (continued)

Failed or downgraded equipment	Effect on landing minimums	
	Type B	Type A
Middle marker (ILS only)	No effect	No effect unless used as MAPt
RVR assessment systems	No effect	
Approach lights	minimums as for NALS	
Approach lights except the last 210m	minimums as for BALS	
Approach lights except the last 420m	minimums as for IALS	
Stand-by power for approach lights	No effect	
Edge lights, threshold lights and runway end lights	Day: no effect; Night: not allowed	
Centerline lights	Aeroplanes: No effect if flight director (F/D), HUDLS or autoland; otherwise RVR 750m	No effect
	Helicopters: No effect on CAT I and HELI SA CAT I approach operations	
Centerline lights spacing increased to 30m	No effect	
TDZ lights	Aeroplanes: No effect if F/D, HUDLS or autoland: otherwise RVR 750m Helicopters: No effect	No effect
Taxiway lighting system	No effect	

AMC3 SPA.LVO.100(b) Low-visibility operations and operations with operational credits

INSTRUMENT APPROACH OPERATIONS IN LOW-VISIBILITY CONDITIONS – EFFECT ON LANDING MINIMUMS OF TEMPORARILY FAILED OR DOWNGRADED EQUIPMENT FOR APPROACH OPERATIONS WITH A DH BELOW 200ft

a. Only those facilities mentioned in Table 6 should be acceptable to be used to determine the effect of temporarily failed or downgraded equipment on the required RVR for CAT II/III approach operations.

b. The following conditions should be applied to Table 6:

1. multiple failures of runway/FATO lights other than those indicated in Table 6 are not acceptable;
2. failures of both the approach and runway/FATO lights are acceptable at the same time and the most demanding consequence should be applied;
3. for approach operations with a DH below 200ft, a combination of deficiencies in runway/FATO lights and RVR assessment equipment are not permitted; and
4. failures other than ILS, GLS and MLS affect the RVR only and not the DH.

AMC3 SPA.LVO.100(b) Table 6 Failed or downgraded equipment - Effect on landing minimums CAT II/III operations

Failed or downgraded equipment	Effect on landing minimums			
	CAT III (no DH)	CAT III (DH < 50ft	CAT III (DH >= 50ft)	CAT II
Navaid stand-by transmitter	Not allowed	RVR 200m	No effect	
Outer marker (ILS)	No effect if the required height versus glide path can be checked using other means, e.g. DME fix			
Middle marker (ILS)	No effect			
DME	No effect if replaced by RNAV (GNSS) information or the outer marker			
RVR assessment systems	At least one RVR value to be available on the aerodrome	On runways equipped with two or more RVR assessment units, one may be inoperative		
Approach lights	No effect	Not allowed for operations with DH > 50ft		Not allowed
Approach lights except the last 210m	No effect			Not allowed

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AMC3 SPA.LVO.100(b) Table 6 Failed or downgraded equipment - Effect on landing minimums CAT II/III operations (continued)

Failed or downgraded equipment	Effect on landing minimums			
	CAT III (no DH)	CAT III (DH < 50ft	CAT III (DH >= 50ft)	CAT II
Approach lights except the last 420m	No effect			
Standby power for approach lights	No effect			
Standby power for runway lights with 1-second switchover time	No effect	Not allowed	Day: RVR 550m	Day: RVR 550m
			Night: RVR 550m	Night: RVR 550m
Edge lights	No effect	Day: no effect	Day: no effect	Day: no effect
		Night: RVR 550m	Night: RVR 550m	Night: not allowed
Threshold lights	No effect	No effect	Day: no effect	Day: no effect
			Night: RVR 550m	Night: not allowed
Runway end lights	No effect if centerline lights are serviceable			
Centerline lights	Day: RVR 200m	Not allowed	Day: RVR 300m	Day: RVR 350m
	Night: not allowed		Night: RVR 400m	Night: RVR 550m (RVR 400m with HUD or auto-land)
Centerline lights spacing increased to 30m	RVR 150m		No effect	
TDZ lights	No effect	Day: RVR 200m	Day: RVR 300m	
		Night: RVR 300m	Night: RVR 550m (RVR 350m with HUD or auto-land)	
Taxiway light system	No effect			

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AMC3 SPA.LVO.100(b) Table 7 Failed or downgraded equipment - Effect on landing minimums Operational credits

Failed or downgraded equipment	Effect on landing minimums			
	SA CAT I	SA CAT II	EFVS-A	EFVS-L
Navaid stand-by transmitter	No effect			
Outer marker (ILS)	No effect if replaced by height check at 1000ft			
Middle marker (ILS)	No effect			
RVR assessment systems	On runways equipped with two or more RVR assessment units, one may be inoperative			
Approach lights	Not allowed		As per IAP	
Approach lights except the last 210m	Not allowed	No effect	As per IAP	
Approach lights except the last 420m	No effect		As per IAP	
Standby power for approach lights	No effect			
Edge lights, Threshold lights	Day: no effect	Day: no effect	As per IAP	
	Night: not allowed	Night: RVR 550m		
Runway end lights	No effect if centerline lights are serviceable		As per IAP	
Centerline lights	Day: RVR 400m	Day: RVR 300m	As per IAP	
	Night: RVR 550m	Night: RVR 400m	As per IAP	
Centerline lights spacing increased to 30m	No effect		As per IAP	
TDZ lights	No effect	Day: RVR 300m	As per IAP	
		Night: RVR 350m		
Taxiway light system	No effect			

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16 ENHANCED FLIGHT VISION SYSTEMS – RVR REDUCTION

GM4 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

OPERATIONS WITH OPERATIONAL CREDITS – EFVS OPERATIONS

a. EFVS operations, if approved, exploit the improved visibility provided by the EFVS to allow an operational credit applied to the visual segment of an instrument approach. An EFVS cannot be used to extend the instrument segment of an approach and thus the DH for operation with an EFVS is always the same as for the same approach conducted without an operational credit.

b. EFVS operations require specific approval from the competent authority in accordance with Part-SPA. However, other EFVS operations may be conducted by operators and without a specific approval if specifically covered in accordance with Part-CAT, Part-NCC or Part-SPO (e.g. 'EFVS 200').

GM5 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

OPERATIONS WITH OPERATIONAL CREDITS – COMBINED VISION SYSTEM

A combined vision system (CVS) consisting of an EFVS and an SVS can be approved for EFVS operations if it meets all the certification requirements for an EFVS.

AMC3 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

OPERATIONS WITH OPERATIONAL CREDITS – EFVS OPERATIONS TO A RUNWAY

When conducting EFVS operations to a runway:

a. the DA/H used should be the same as for operations without EFVS;

b. the lowest RVR minimums to be used should be determined:

   1. in accordance with criteria specified in the AFM for the expected weather conditions; or

   2. if no such criteria are specified, by reducing the RVR determined for operation without the use of EFVS/CVS in accordance with Table 10.

c. where the lowest RVR to be used, determined in accordance with b., is less than 550m, then this should be increased to 550m unless LVPs are established at the aerodrome of intended landing;

d. where the EFVS is part of a CVS, it is only the EFVS element that should provide the operational credits. The other part of the CVS, the synthetic vision system (SVS), should not provide operational credits.

AMC3 SPA.LVO.100(c) Table 10 Operations using EFVS/CVS - RVR/CMV Reduction

RVR/CMV (m) required without the use of EFVS	RVR/CMV (m) required with the use of EFVS
550	350
600	400
650	450
700	450
750	500
800	550
900	600
1000	650
1100	750
1200	800
1300	900
1400	900
1500	1000
1600	1100
1700	1100
1800	1200
1900	1300
2000	1300
2100	1400
2200	1500
2300	1500
2400	1600

NOTE: For the RVR/CMV required with the use of EFVS of 350m – 500m: a reported RVR should be available (no CMV conversion).

17 COMMENCEMENT AND CONTINUATION OF APPROACH

AMC1 CAT.OP.MPA.305(a) Commencement and continuation of approach

MINIMUM RVR FOR CONTINUATION OF APPROACH — AEROPLANES

(a) The touchdown RVR should be the controlling RVR.

(b) If the touchdown RVR is not reported, then the midpoint RVR should be the controlling RVR.

(c) Where the RVR is not available, CMV should be used except for the purpose of continuation of an approach in LVO.

18 PLANNING MINIMUMS

AMC6 CAT.OP.MPA.182 Fuel/energy scheme - Aerodrome selection policy - aeroplanes

BASIC FUEL SCHEME-PLANNING MINIMUMS

The operator should select an aerodrome as:

(a) destination alternate aerodrome;

(b) fuel ERA aerodrome; or

(c) isolated destination aerodrome

only when the appropriate weather reports and/or forecasts indicate that the weather conditions will be at or above the planning minimums of Table 2 below (any limitations related to OEI operations are also taken into account):

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS - EFFECTIVE 30 OCTOBER 2022

AMC6 CAT.OP.MPA182 Table 2 - Basic fuel scheme - planning minimums - aeroplanes Destination alternate aerodrome, fuel ERA aerodrome, isolated destination aerodrome

Type of approach operation	Aerodrome ceiling (cloud base or vertical visibility)	RVR/VIS
Type B instrument approach operations	DA/H + 200ft	RVR/VIS + 800m
Type A instrument approach operations	DA/H or MDA/H + 400ft	RVR/VIS + 1500m
Circling approach operations	MDA/H + 400ft	VIS + 1500m
Crosswind planning minimums: see Table 1 'Aerodrome forecasts (TAFs) and landing forecasts (TRENDs) to be used for pre-flight planning' of AMC3 CAT.OP.MPA.182.		
Wind limitations should be applied taking into account the runway condition (dry, wet, contaminated).		

AMC8 CAT.OP.MPA.182 Fuel/energy scheme - aerodrome selection policy - aeroplanes

BASIC FUEL SCHEME WITH VARIATIONS - PLANNING MINIMUMS

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(a) Variations to the basic fuel schemes in the selection of aerodromes in regard to the planning minimums are methods to reduce the meteorological margins based on the established mitigating measures.

(b) As a minimum, the operator should:

(1) use a suitable computerised flight-planning system; and

(2) have established an operational control system that includes flight monitoring.

(c) In addition:

(1) the duration of the planned flight from take-off to landing does not exceed 6 hours or, in the event of in-flight re-planning, in accordance with point CAT.OP.MPA.181(d), the remaining flying time to destination does not exceed 4 hours; and

(2) the planned flight should have a minimum flight crew of two pilots.

(d) Additionally, the operator should select an aerodrome as:

(1) a destination alternate aerodrome, or

(2) fuel ERA aerodrome,

only when the appropriate weather reports and/or forecasts indicate that the weather conditions will be at or above the planning minimums of Table 3 below.

AMC8 CAT.OP.MPA182 Table 3 - Basic fuel scheme with variations- planning minimums - aeroplanes Destination alternate aerodrome, fuel ERA aerodrome

Row	Type of approach operation	Aerodrome ceiling (cloud base or vertical visibility)	RVR/VIS
1	Type B instrument approach operations	DA/H + 200ft	RVR/VIS + 550m
2	3D Type A instrument approach operations, based on a facility with a system minimum of 200ft or less	DA/H + 200ft	RVR/VIS[1] + 800m
3	Two or more usable type A instrument approach operations[2], each based on a separate navigation aid	DA/H or MDA/H [3]+ 200ft	RVR/VIS[1]+ 1000m
4	Other type A instrument approach operations	DA/H or MDA/H + 400ft	RVR/VIS + 1500m
5	Circling approach operations	MDA/H + 400ft	VIS + 1500m
Crosswind planning minimums: see Table 1 of AMC3 CAT.OP.MPA.182.			
Wind limitations should be applied taking into account the runway condition (dry, wet, contaminated).			

[1] The higher of the usable RVR or VIS.

[2] Compliance with point CAT.OP.MPA.182(f) should be ensured.

[3] The higher of the usable DA/H or MDA/H.

NOTE: The operator may select the most convenient planning minimums row. For example, aerodrome with two type A approaches: one ILS CAT I (DA 350ft/DH250ft/550m) another VOR/DME (MDA 650ft/1500m). The operator may use Row 2 instead of Row 3.

AMC9 CAT.OP.MPA.182 Fuel/energy scheme - aerodrome selection policy - aeroplanes

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AERODROME OPERATING MINIMUMS - EASA AIR OPERATIONS - EFFECTIVE 30 OCTOBER 2022

BASIC FUEL SCHEME WITH VARIATIONS - PLANNING MINIMUMS

(a) Variations to the basic fuel schemes in the selection of aerodromes in regard to the planning minimums are methods to reduce the meteorological margins based on the established mitigating measures.

(b) As a minimum, the operator should:

(1) use a suitable computerised flight-planning system;

(2) hold an approval for low-visibility approach operations for that fleet; and

(3) have established an operational control system that includes flight monitoring.

(c) Additionally, the operator should select an aerodrome as:

(1) destination alternate aerodrome;

(2) fuel ERA aerodrome; or

(3) isolated destination aerodrome

only when the appropriate weather reports and/or forecasts indicate that the weather conditions will be at or above the planning minimums of Table 4 below.

AMC9 CAT.OP.MPA182 Table 4 - Basic fuel scheme with variations - planning minimums Destination alternate aerodrome, fuel ERA aerodrome, isolated destination aerodrome

Row	Type of approach operation	Aerodrome ceiling (cloud base or vertical visibility)	RVR/VIS
1	Two or more usable type B instrument approach operations to two separate runways[1]	DA/H[2] + 100ft	RVR[3] + 300m
2	One usable type B instrument approach operation	DA/H + 150ft	RVR + 450m
3	3D Type A instrument approach operations, based on a facility with a system minimum of 200ft or less	DA/H + 200ft	RVR/VIS[3]+ 800m
4	Two or more usable type A instrument approach operations[1], each based on a separate navigation aid	DA/H or MDA/H + 200ft	RVR/VIS[3]+ 1000m
5	One usable type A instrument approach operations	DA/H or MDA/H + 400ft	RVR/VIS + 1500m
6	Circling approach operations	MDA/H + 400ft	VIS + 1500m
Crosswind planning minimums: see Table 1 of AMC3 CAT.OP.MPA.182.			
Wind limitations should be applied taking into account the runway condition (dry, wet, contaminated).			

[1] Compliance with point CAT.OP.MPA.182(f) should be ensured.

[2] The higher of the usable DA/H or MDA/H.

[3] The higher of the usable RVR or VIS.

NOTE: The operator may select the most convenient planning minimums row. For example, aerodrome with two type B approaches: one CAT 3 (0ft/75m) another CAT 1 (200ft/550m). The operator may use Row 2 and use CAT 3 (0 + 150ft/75 + 450m) instead of Row 1 CAT 1 (200 + 100ft/550 + 300m).

SPA.ETOPS.115 ETOPS en-route alternate aerodrome planning minimums

(a) The operator shall only select an aerodrome as an ETOPS en-route alternate aerodrome when the appropriate weather reports or forecasts, or any combination thereof, indicate that, between the anticipated time of landing until one hour after the latest possible time of landing, conditions will exist at or above the planning minima calculated by adding the additional limits of Table 1.

SPA.ETOPS.115 Table 1- Planning minimums for the ETOPS en-route alternate aerodrome

Type of approach	Planning Minimums
Precision approach	DA/H + 200ft RVR/VIS + 800m
Non-precision approach or Circling approach	MDA/H + 400ft RVR/VIS + 1500m

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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.

74 *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.

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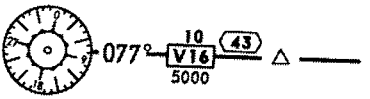
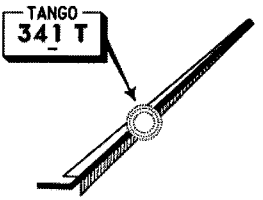


REFERENCE DATUM

Not all States (countries) have complied with the ICAO Annex that specifies the use of the WGS-84 reference datum. Differences in reference datums can cause significant "accuracy bias" in the navigation guidance provided by avionics systems. A listing of the States that have published their coordinates in WGS-84 can be found on Jeppesen's web site at www.jeppesen.com/onlinepubs/wgs-84.phtml.

3. NAVAIDS

COMPLETENESS - Because of the duplication of identifiers and other factors, not all charted navaids are included in the database.



NDB AND LOCATOR IDENTIFIERS

As an example of the differences between the display from one avionics system to another, some avionics systems will display the Foley NDB as "FPY":

Some avionics systems include a suffix "NB" after the NDB identifiers and will display the Foley NDB as "FPYNB". For NDBs and locators with duplicate Morse code identifiers that are located within the same State (country), they may only be available using the airport identifier for access.

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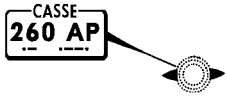
3. NAVAIDS (Cont)

LOCATOR IDENTIFIERS

Most locators in the United States have unique five-letter names, but most international locators have names that do not have five letters.

Some systems may display U.S. locators as "CASSE".

Some systems may display U.S. locators as "AP".



DUPLICATE NAVAID IDENTIFIERS

There are numerous duplicates in the database. Refer to your avionics handbook for the proper procedure to access navaids when duplicate identifiers are involved.

Not all navaids in the database are accessible by their identifier. Some navaids, for reasons such as duplication within terminal areas or lack of complete information about the navaid, are in the waypoint file and are accessible by their name or abbreviated name.

4. WAYPOINTS

WAYPOINT DATABASE IDENTIFIERS

"Database identifiers" refers to identifiers used only in avionics systems utilizing databases. The identifiers are not for use in flight plans or ATC communications; however, they are also included in computer flight planning systems. They may be designated by the State (country) as "Computer Navigation Fixes" (CNFs), or designated by Jeppesen. To facilitate the use of airborne avionics systems, the identifiers are being added to Jeppesen's charts. Both the CNFs created by States and the Jeppesen-created database identifiers are enclosed within square brackets and in italics.

- Jeppesen's ultimate goal is to include all database identifiers for all waypoints/fixes on the charts.
- Enroute charts include the five-character identifier for unnamed reporting points, DME fixes, mileage breaks, and for any reporting point with a name that has more than five characters.
- SID, DP and STAR charts are being modified to include all identifiers.

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4. WAYPOINTS (Cont)

WAYPOINT DATABASE IDENTIFIERS (Cont)

- Approach Charts

  VNAV descent angle information derived from the Jeppesen NavData database is being added to approach charts. Identifiers are shown for the Final Approach Fix (FAF), Missed Approach Point (MAP), and the missed approach termination point.

  State-named Computer Navigation Fixes (CNFs) are shown on all applicable charts.

  GPS (GNSS) type approach charts include all database identifiers.

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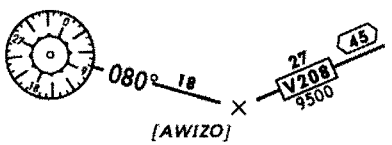
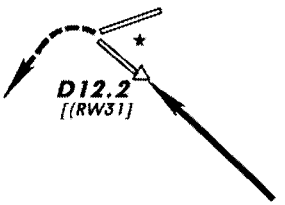




COMMON WAYPOINT NAME FOR A SINGLE LOCATION

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.

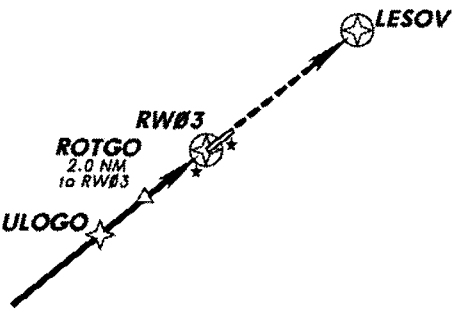
FLY-OVER versus FLY-BY FIXES/WAYPOINTS

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

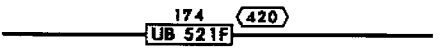
5. AIRWAYS

ATS ROUTES

Airways identified as ATC routes by States (countries) cannot be uniquely identified. They are not included in the Jeppesen NavData database.

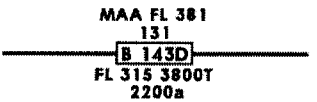
DESIGNATORS

Jeppesen NavData database airway designators are followed by a code indicating ATC services (such as A for Advisory, F for Flight Information) when such a code is specified by the State (country). Not all airborne systems display the ATC services suffix.



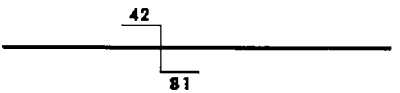
ALTITUDES

Minimum Enroute Altitudes (MEAs), Minimum Obstacle Clearance Altitudes (MOCAs), Off Route Obstacle Clearance Altitudes (OROCAs), Maximum Authorized Altitudes (MAAs), Minimum Crossing Altitudes (MCAs), Minimum Reception Altitudes (MRAs), and Route Minimum Route Off-Route Altitudes (Route MORAs) - - These minimum altitudes for airways are not displayed in most avionics systems.



CHANGEOVER POINTS

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



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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

6. ARRIVALS AND DEPARTURES

PROCEDURES NOT IN THE DATABASE

Jeppesen publishes some officially designated departure procedures that include only text on IFR airport charts beneath the take-off minimums. They may be labeled "Departure Procedure", "IFR Departure Procedure", or "Obstacle DP". Most of these are U.S. and Canadian procedures, although there is a scattering of them throughout the world. Any waypoint/fix mentioned in the text is in the Jeppesen NavData database. *However, these text-only departure procedures are not in the database.*

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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:	Cyote Four Departure(CYOTE.CYOTE4) becomes
DATABASE	CYOTE4.

When no computer code is assigned, the name is truncated to not more than six characters. The database procedure identifier is created according to the ARINC 424 specifications.

Database procedure identifiers are charted in most cases. They are the same as the assigned computer code (charted within parentheses) or are being added [*enclosed within square brackets].* Do not confuse the bracketed database identifier with the official procedure name (which will be used by ATC) or the official computer code (which is used in flight plan filing).

400-FOOT CLIMBS

Virtually all departures in the database include a climb to 400 feet above the airport prior to turning because of requirements in State regulations and recommendations. The 400-foot climb is not depicted on most charts. When States specify a height other than 400 feet, it will be in the Jeppesen NavData database.

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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

6. ARRIVALS AND DEPARTURES (Cont)

TAKE-OFF MINIMUMS AND CLIMB GRADIENTS

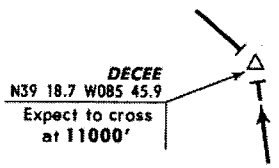
The take-off minimums and climb gradients that are depicted on the charts are not included in the database.

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	683	1025	1367	1708	2050

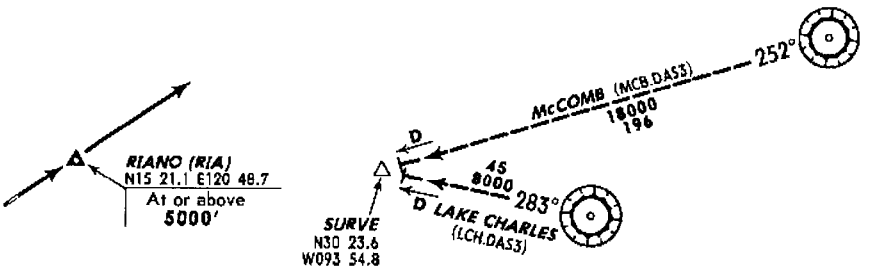
"EXPECT" and "CONDITIONAL" INSTRUCTIONS

Altitudes depicted on charts as "Expect" instructions, as "Expect to cross at 11,000'" are not included in the Jeppesen NavData database. When "Conditional" statements such as "Straight ahead to ABC 8 DME or 600', whichever is later", are included on the charts, only one condition can be included in the database.



ALTITUDES

Databases include charted crossing altitudes at waypoints/fixes. Charted Minimum Enroute Altitudes (MEAs) and Minimum Obstacle Clearance Altitudes (MOCAs) are not included. The 5,000-foot altitude at RIANO is included in the database. The MEAs between SURVE and the two VORs are not included.



STAR OVERLAPPING SEGMENTS

STARs normally terminate at a fix where the approach begins or at a fix where radar vectoring will begin. When STAR termination points extend beyond the beginning of the approach, some avionics equipment may display a route discontinuity at the end of the STAR and the first approach fix.

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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.

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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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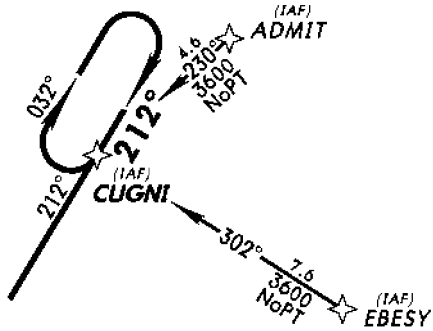
AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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

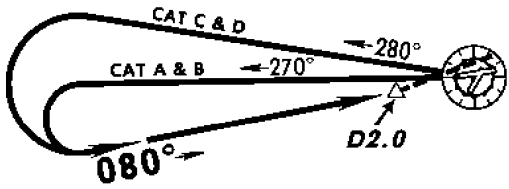


BASE TURN (TEARDROP) APPROACHES

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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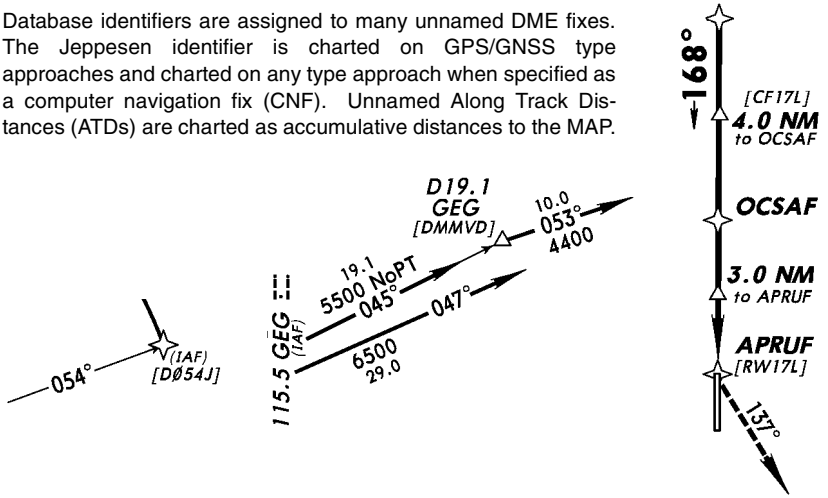
AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

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.



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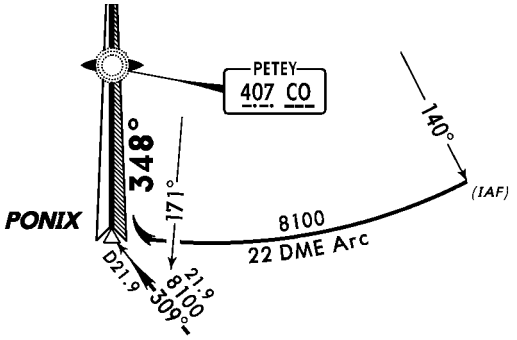
APPROACH TRANSITION TO LOCALIZER

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

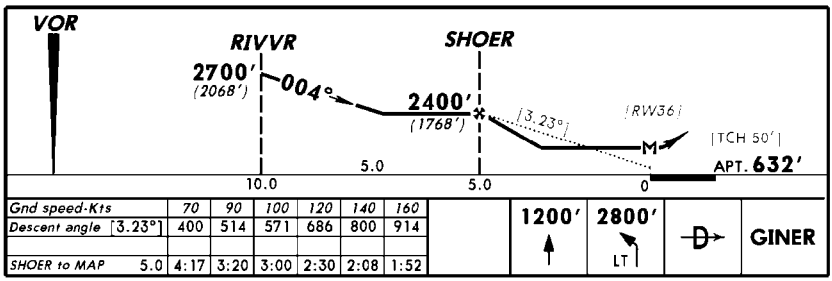
Vertical descent angles for most *straight-in non-precision landings are included in the database and published on charts with the following exceptions:

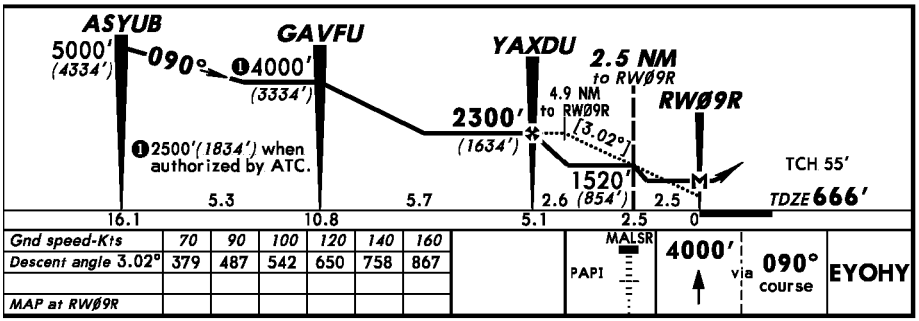
1) When precision and non-precision approaches are combined on the same chart, or

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.

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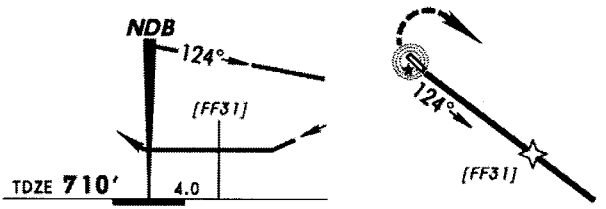
GPS/GNSS SENSOR FAF

The Jeppesen NavData database includes a sensor final approach fix when the approach was not originally designed with an FAF, and they are charted on "GPS/GNSS type" approaches.



FINAL APPROACH FIX (FAF), ILS and LOCALIZER APPROACHES

There may be several types of fixes charted at the same FAF location - locator, waypoint, intersection, DME fix, OM, or perhaps an NDB instead of a locator. Since many airborne navigation systems with databases don't store locators and NDBs as navaids, a four- or five-character identifier will be used for the FAF on ILS and localizer approaches. The four- or five-character identifier assigned to the FAF location is contained in the waypoint file of the Jeppesen NavData database.

If there is a named intersection or waypoint on the centerline of the localizer at the FAF, the name of the fix will be used for the FAF location.

The FAF must be on the localizer centerline or the avionics system will fly a course that is not straight. Frequently, OMs and LOMs are not positioned exactly on the localizer centerline, and a database fix is created to put the aircraft on a straight course.

When the LOM is on the centerline and there also is a named intersection or waypoint on the centerline, the name of the intersection or waypoint will be used for the FAF. For CHUPP LOM/Intersection, the database identifier is "CHUPP" because there is an intersection or waypoint on the centerline of the localizer at the FAF.

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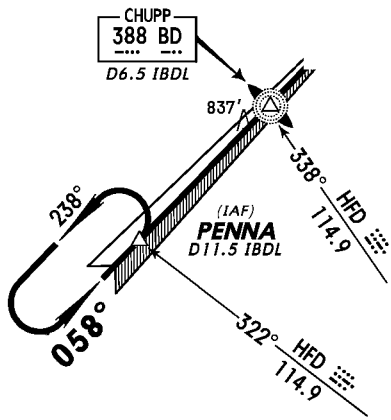
AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

9. APPROACH PROCEDURES (PROFILE) (Cont)
FINAL APPROACH FIX (FAF), ILS and LOCALIZER APPROACHES (Cont)

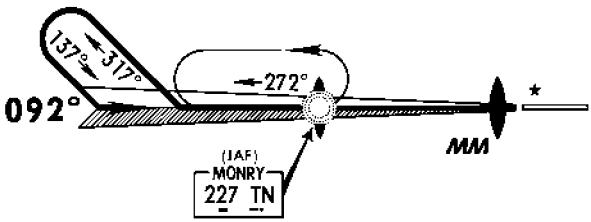
When the ILS or localizer procedure is being flown from the database, the four- or five-character name or identifier such as CHUPP, FF04, or FF04R, etc. will be displayed as the FAF.

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.

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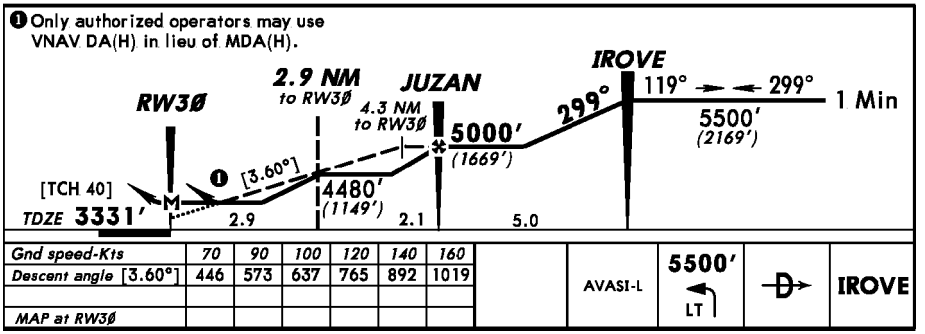


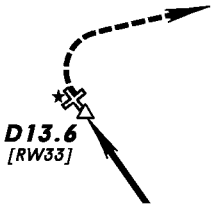
ILS AND RUNWAY ALIGNMENT

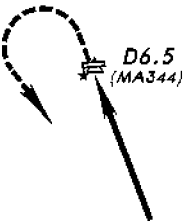
Differences in government specified values for localizer and airport variation may cause apparent non-alignment of the localizer and the runway. These differences are gradually being resolved, and whenever possible the airport variation is used for the localizer variation.

10. APPROACH PROCEDURES (MISSED APPROACH)

MISSED APPROACH POINT (MAP)

For non-precision approaches, when the MAP is other than a navaid, there will be a database MAP waypoint with a unique identifier. If the MAP is a waypoint and is at or within 0.14 NM of the threshold the MAP identifier will be the runway number, as "RW04" for Rwy 4 threshold. If the MAP is not at the runway, there will either be an official name for the MAP, or an identifier is provided. GPS/GNSS type approaches, and charts with descent angles, include the database identifier of the MAP.





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10. APPROACH PROCEDURES (MISSED APPROACH) (Cont)

400-FOOT CLIMBS

The database includes a climb to 400 feet above the airport prior to turning on a missed approach. This climb is not part of the official procedure, but does comply with State regulations and policies. This specific climb to 400 feet is not included on charts. The missed approach text supplied by the State authority is charted.

MISSED APPROACH: Turn RIGHT track 080° to intercept CS VOR R-040 (040° bearing from CS NDB). Climb to 5000′ and track to D15 CS or GPS or as directed by ATC.

LIMITATION: Max 185 Kt IAS until established on CS VOR R-040 (040° bearing from CS NDB).

CAUTION: Do NOT delay turn onto 080° due to high terrain West of Missed Approach Area.

MISSED APPROACH PROCEDURE

The routes/paths that comprise a missed approach are not always displayed in some avionics systems that use databases. Additionally, some avionics systems that include missed approach procedures don't always implement a full set of path terminators so many legs will not be included in the airborne database. ***Refer to the charted missed approach procedure when executing a missed approach.***

MISSED APPROACH: Climb to **1500′** then climbing **LEFT** turn to **2400′** via heading **280°** and outbound **TUL VOR R-238** to **KEVIL INT** and hold.

11. ROUTES ON CHARTS BUT NOT IN DATABASES

The routes in approach procedures, SIDs (DPs), and STARs are coded into the database using computer codes called path terminators which are defined in the ARINC 424 Navigation Database Specification. A path terminator 1) Defines the path through the air, and 2) Defines the way the leg (or route) is terminated. Not all avionics systems have implemented the full set of path terminators specified in the ARINC 424 document.

Because of the incomplete set of path terminators in some avionics systems, pilots need to ensure their avionics systems will take them on the routes depicted on the charts. If the avionics systems don't have all the routes, or don't have the means to display them, it is the pilot's responsibility to fly the routes depicted on the charts.

FINAL COCKPIT AUTHORITY, CHARTS OR DATABASE

There are differences between information displayed on your airborne avionics navigation system and the information shown on Jeppesen charts. *The charts, supplemented by NOTAMs, are the final authority.*

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AERONAUTICAL INFORMATION NAVDATA DATABASE AND CHARTS

GLOSSARY/ABBREVIATIONS

AIRAC - Aeronautical Information Regulation and Control. Designates the revision cycle specified by ICAO, normally 28 days.

ARINC - Aeronautical Radio, Inc

ATD - Along Track Distance, as "3 NM to RW24".

ATS Route - Officially designated route. No designator assigned.

CNF - Computer Navigation Fix

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DATABASE IDENTIFIER - Avionics system use only, not for flight plans or ATC communications. Identifies a waypoint or fix.

DP - Departure Procedure

FAA - Federal Aviation Administration

FACF - Final Approach Capture Fix. Database includes (usually as an intermediate fix) when no suitable fix is specified in source.

FAF - Final Approach Fix

FLY-BY FIX - Waypoint allows use of turn anticipation to avoid overshoot of the next flight segment.

FLY-OVER FIX - Waypoint precludes any turn until the fix is over flown and is followed by an intercept maneuver of the next flight segment.

FMS - Flight Management System

GNSS - Global Navigation Satellite System

GPS - Global Positioning System

GPS/GNSS SENSOR FAF - Database fix that changes sensitivity of the Course Deviation Indicator (CDI) on final approach.

GPS/GNSS TYPE APPROACHES - Any approach that can be flown with GPS/GNSS as the only source of navigation.

ICAO - International Civil Aviation Organization

IAF - Initial Approach Fix

IF - Intermediate Approach Fix

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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

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NICOSIA FIR IATA COMMUNICATION PROCEDURES

(extract from IATA Operational Notice 004/21)

a. **General**

Following the establishment, in 1974, of a separate administration in the north of Cyprus (though one not recognised by the United Nations), the "Ercan Advisory Area" was introduced in 1977. This is monitored by "Ercan Control" for Air Traffic Control covering the northern part of the Nicosia FIR and parts of the southwestern section of the Ankara FIR. The control of this area by Ercan is not recognised by ICAO.

Contrary to ICAO requirements, there is no contact in effect between Ankara and Nicosia ACCs. Authority for Air Traffic Control within Nicosia ICAO FIR (LCCC), rests solely with Nicosia ACC. ATC instructions must ONLY be accepted from Nicosia ACC, including allocation of SSR codes.

Operations in the northern part of the Nicosia FIR are subject to the hazards of conflicting ATC instructions in the same piece of airspace, uncoordinated transfer of traffic, and unknown military activity in close proximity of civil traffic. Events of failures to coordinate flight plans and deviations from ATC instructions are reported every year, involving, for the best part, operators that are not using that airspace frequently and therefore might not be familiar with the issue.

The following guidance is provided to complement AIP information and active NOTAMs, that must be consulted in conjunction with this Operational Notice.

b. **Southbound Procedures**

While in Ankara FIR comply with control instructions issued by Ankara ACC (either directly or through any other station designated by Ankara, e.g. Ercan on 126.70MHz) up to point VESAR or point TOMBI.

Nicosia ACC requires that aircraft approaching Nicosia FIR from Ankara FIR make pre-entry contact at least 10 minutes before the FIR boundary. It is essential that crews comply with this requirement: only then will Nicosia ACC be in a position to assume control and provide appropriate traffic separation.

Once contact is established and flight details including Flight Level (FL) information passed, avoid making requests to Ankara ACC for FL changes for the rest of the flight through Ankara FIR, unless climbing from or descending to aerodromes in the immediate vicinity of the FIR boundary. If for any reason, it becomes absolutely necessary to make such level changes after initial contact with Nicosia while still in Ankara FIR, it is important for safety reasons that Nicosia ACC be advised at once of the change.

At VESAR or TOMBI, flights will come under the sole control of Nicosia, change automatically to Nicosia ACC. Although there are no formal transfer of control procedures between Ankara and Nicosia ACCs and no changeover instructions will be issued on crossing the FIR boundary, once within the Nicosia FIR, flights should ONLY accept control instructions issued by Nicosia ACC until hand over to the next ATC Unit or FIR. Any invitation to change to another station (e.g. Ercan Control) should be politely acknowledged but disregarded. In case of insistence a check should be made with Nicosia ACC.

For flights entering the Nicosia FIR from the north and continuing east to the Damascus FIR, on completion of ATC formalities with Nicosia ACC after entry into the FIR as well as the position reporting requirements for Damascus FIR, establish communications with "Ercan" station and pass on relevant flight details. This should be regarded as a purely courtesy call – under NO circumstances should any ATC instruction be accepted from "Ercan" station.

c. **Northbound Procedures**

Due to lack of direct contact between Ankara and Nicosia centers, advance flight information can ONLY be provided to Ankara by relay. Provide flight information at least 10 minutes prior to entering Ankara FIR, to Ercan station on 126.70MHz for relay to Ankara. Any Flight Level changes made thereafter under instructions from Nicosia ACC must be communicated at once to Ercan Control for relay to Ankara ACC. Control authority of Nicosia ACC remains absolute up to the point of entry into Ankara FIR.

d. **Eastbound Procedures**

Eastbound aircraft entering Damascus FIR are required to establish contact with Damascus ACC 10 minutes before ETA at NIKAS. If for any reason this is not possible, aircraft must provide a position report to Latakia Radio, a relay station for Damascus ACC, at VESAR, ALSUS or BALMA for relay to Damascus. Even if a position report and flight details have been communicated to Latakia Radio, two-way communications with Damascus ACC should be established as early as possible and before passing the Banias NDB. Nicosia ACC remains primary station for listening watch until NIKAS where you can expect to transfer to Damascus.

e. **Westbound Procedures**

Aircraft flying west from the Damascus FIR should establish contact with Nicosia at the FIR boundary (NIKAS) unless requested by Damascus ACC to call Nicosia earlier.

Aircraft planning to continue into the Ankara FIR should follow the "Northbound Procedures" above and provide flight information at least 10 minutes prior to entering Ankara FIR, to Ercan station on 126.70MHz for relay to Ankara.

Control authority remains with Nicosia ACC until the FIR boundary (VESAR). Further calls to "Ercan" station may be made if requested, to the extent other commitments permit.

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GLOBAL APPLICATION OF NEW AERODROME OPERATING MINIMUMS (AOM) CONCEPT

PURPOSE

The purpose of this Bulletin is to announce the new Standard AOM concept and provide a general description of the forthcoming changes concerning the way in which Jeppesen determines and applies Aerodrome Operating Minimums (AOM) for landing and take-off to its worldwide library of the Instrument Approach Procedures (IAP) and Airport charts in the Jeppesen Airway Manual.

BACKGROUND

Jeppesen has a long history as a global provider of aeronautical charts, navigation data and related services. Among these essential services has been the uniform publication of Aerodrome Operating Minimums on Airway Manual charts.

Jeppesen's policy to recognize and respect the authority of individual State Aviation Authorities is a fundamental principle past, present, and future.

The original Jeppesen Standard for AOM is known as the "Explanation of Common Airport Operating Minimum Specifications", or ECOMS. This standard was significantly influenced by U.S. FAA TERPS visibility tables which were widely accepted when ECOMS was originally created in the late 1970s.

Over the years Jeppesen has been involved in initiatives to develop new, harmonized global AOM concepts. These industry efforts led to the development of Joint Aviation Authorities JAR-OPS, then EASA AIR OPS and in 2017 to the publication of the 4th edition of ICAO's Doc 9365 Manual of All-Weather Operations (AWOM). This was the genesis of the decision to replace the aged ECOMS with a new Jeppesen AOM concept which is aligned with the new ICAO AWOM.

OBJECTIVES

The implementation of the new Standard AOM is intended to adopt accepted ICAO standards and to better serve developments in aviation (such as Continuous Descent Final Approach flight technique, Approaches with Vertical Guidance, Enhanced Vision Systems, Performance Based Navigation, etc.). It also leads to the presentation of the lowest possible visibility minimums which are authorized by the State of the aerodrome.

The **Jeppesen Standard AOM Policy** for the depiction of operating minimums is:

a. **State-provided AOM will always be depicted as published by the State**.

   State-provided visibilities may be lower than the visibilities determined according to ICAO's AWOM. The determination of lower values by the State is not precluded by ICAO if such values result in an acceptable level of safety. **Therefore, the State-provided visibilities will not being raised to match the visibilities from the tables in ICAO AWOM**.

   If the State does not provide AOM for "ALS out" condition, ALS out visibility values will be determined according to the rules and tables in ICAO's AWOM, but not below any State-provided visibilities for operational approach lights.

   "Provided by State" means either, minimum visibilities are published on procedure source, within the Aeronautical Information Publication (AIP), or a specific AOM concept has to be applied within this State.

b. **Where a State does not provide any AOM, Jeppesen will determine visibility values according to the rules and tables in ICAO's AWOM.**

c. **Operators with tailored AOM concepts** will continue to be accommodated in accordance with the established processes.

SCOPE

The systematic conversion from ECOMS to the new Standard AOM will affect operators differently depending on the nature of their operations; domestic or international, country of origin, etc.

Operators, especially those who operate internationally, are encouraged to become familiar with ICAO Doc 9365 AWOM with respect to possible implications. FAA and EASA approved operators might be less affected because of the harmonization with ICAO.

The effects of replacing ECOMS-based visibility values with the new ICAO-based visibilities will vary by State or by region.

In States where complete AOM are provided (such as United States), minimum visibility will typically remain the same. If the charted visibility was raised because of a higher ECOMS table value, it is now being replaced by the lower State-provided visibility value.

In States that provide no or incomplete AOM, significant changes will apply on instrument approach procedures charts. The new visibilities might be higher or lower than the charted ones.

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GLOBAL APPLICATION OF NEW AERODROME OPERATING MINIMUMS (AOM) CONCEPT

OVERVIEW OF NEW JEPPESEN STANDARD AOM

MINIMUMS BOX LABEL

In the future, the new Std label will apply to Jeppesen charts to indicate that the charted minimums are determined according to the rules of the new Jeppesen AOM concept.

The current Standard label on existing charts, which indicates the AOM are according to EU-OPS/EASA AIR OPS, will be replaced by Std/State.

Minimums with the Std/State label are determined according to a State Regulation which provides rules **similar** to the ICAO AWOM. Deviations from ICAO AWOM will be described in ATC State pages in the Airway Manual.

If the minimums are determined according to another AOM concept which is **not** similar to ICAO AWOM, the State Regulation will be indicated by a different label:

TERPS	minimums based on TERPS
State	State simply provides minimums, regulation/rules might be unknown
JAR-OPS	minimums based on JAR-OPS
Military	minimums supplied with Military procedures

SCENARIOS INVOLVING THE AVAILABILITY OF STATE-PROVIDED AOM FOR LANDING

Descent Limit

The procedure source may include the following information to determine the descent limit for the specific approach procedure:

a. DA, DH, DA(H) or MDA, MDH, MDA(H) or similar information;
b. OCA, OCH or OCA(H);
c. DA(H) or MDA(H) together with the procedure design OCA(H).

Guidelines for the determination of applicable Descent Limit values for landing minimums are outlined below.

Approach Type/ Condition	Source Provides	Descent Limit in Minimums Box labelled as	Notes
Precision (ILS, MLS, PAR, GLS, LPV200, etc.)	DA, DH, DA(H)	DA(H)	Adjustments may be made for rounded source values.
APV (LPV, LNAV/VNAV)			
Precision (ILS, MLS, PAR, GLS, LPV200, etc.)	OCA, OCH, OCA(H)	DA(H)	The DA(H) is determined according to the rules described in ICAO AWOM. Adjustments may be made for rounded source values.
APV (LPV, LNAV/VNAV)			
Non-precision (LNAV, LP, LOC, VOR, NDB, VDF, SRA, etc.)	MDA, MDH, MDA(H)	MDA(H)	**Depiction of MDA(H) as descent limit is independent from using the CDFA or non-CDFA flight technique.** Adjustments may be made for rounded source values.

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GLOBAL APPLICATION OF NEW AERODROME OPERATING MINIMUMS (AOM) CONCEPT

Approach Type/ Condition	Source Provides	Descent Limit in Minimums Box labelled as	Notes
Non-precision (LNAV, LP, LOC, VOR, NDB, VDF, SRA, etc.)	DA, DH, DA(H)	DA(H)	**It is assumed that a height loss adjustment is applied by the State.** Adjustments may be made for rounded source values.
Non-precision CDFA flight technique/continuous descent profile (LNAV, LP, LOC, VOR, NDB, VDF, SRA, etc.)	OCA, OCH, OCA(H)	DA/MDA(H)	The DA/MDA(H) is determined according to the rules described in ICAO AWOM and **does not include a height loss adjustment.** Adjustments may be made for rounded source values.
Non-precision non-CDFA flight technique/stepped descent profile (LNAV, LP, LOC, VOR, NDB, VDF, SRA, etc.)	OCA, OCH, OCA(H)	MDA(H)	The MDA(H) is determined according to the rules described in ICAO AWOM. Adjustments may be made for rounded source values.

HEIGHT LOSS ADJUSTMENT NOTES – APPLICABLE TO DA(H) MANEUVER ON NPA

Wherever a State authority has clearly prescribed, provided, or otherwise specified that a non-precision instrument approach procedure has to be flown using the CDFA flight technique, **and** the corresponding descent limit value is published by source as a DA(H), Jeppesen will assume the State-provided DA(H) value includes a height loss adjustment. Only in this case the descent limit would be charted as a DA(H) on a non-precision approach procedure.

IMPORTANT NOTES:

Jeppesen will not add any Height Loss Adjustment to any charted DA/MDA(H) or MDA(H) Descent Limit values unless specified by the State.

When using the CDFA flight technique and using a DA(H) in lieu of MDA(H), operators must determine and apply an appropriate Height Loss Adjustment applicable to the aircraft, landing configuration and/or operating requirements.

If it cannot be determined if the State has incorporated a Height Loss Adjustment, the ball note below will be shown on applicable Non-Precision IAP approach charts. It is the operator's responsibility to provide necessary guidance to pilots.

"VNAV DA(H) in lieu of MDA(H) depends on operator policy."

States may prescribe specific DA(H) height loss adjustment procedures for use when non-precision IAPs are flown using CDFA and DA(H) techniques. Such situations will be noted accordingly. A note will be added to the straight-in landing minimums referencing any State-provided height loss adjustment value or requirement.

IMPORTANT NOTE:

CDFA is a flight technique. It is not a procedure design criterion. Depending on varying regulatory operational requirements, for some operators the use of CDFA for NPAs may be mandatory; for others it may be optional.

Visibility

States may not always provide visibilities for landing. The table below shows the rules which are applied to determine the landing visibility:

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GLOBAL APPLICATION OF NEW AERODROME OPERATING MINIMUMS (AOM) CONCEPT

Scenario	Rules
States provide visibilities for with and without lights	– State-provided visibilities will be charted.
States provide visibilities for with approach lights only (approach lights are available and operational)	– State-provided visibilities will be charted. – Visibilities for "ALS out" will be determined according to ICAO AWOM, but not below the State-provided values for operational lights.
States provide visibilities without lights only (approach lights are not available or not operational at all)	– State-provided visibilities will be charted.
States provide no visibilities at all	– Visibilities will be determined according to ICAO AWOM.

Visibilities will always be labelled as R (= RVR), V (= VIS), C (= CMV) or as R/V (= RVR and/or VIS).

Samples

Std STRAIGHT-IN LANDING

	ILS DA(H) 800′(200′)			LOC (GS out) CDFA [2] DA/MDA(H) 1120′(520′)	
	FULL	TDZ or CL out	ALS out		ALS out
A	R550m	R550m [1]	R1200m	R1500m	R1500m
B					
C				R1600m	R2400m
D					

[1] R750m when a Flight Director or Autopilot or HUD to DA is not used.
[2] VNAV DA(H) in lieu of MDA(H) depends on operator policy.

TERPS STRAIGHT-IN LANDING

	LPV DA(H) 5557′(200′)			LNAV/VNAV DA(H) 5647′(290′)		[1] LNAV MDA(H) 5660′(303′)	
		TDZ or CL out	RAIL or ALS out		RAIL or ALS out		RAIL or ALS out
A	R18. or. V1/2	R24. or. V1/2	R40. or. V3/4	R24. or. V1/2	R45. or. V7/8	R24. or. V1/2	R55. or. V1
B							
C							R45. or. V7/8
D							

[1] LNAV. procedure. not. authorized. during. simultaneous. operations.

Std STRAIGHT-IN LANDING

CAT IIIB ILS	CAT IIIA ILS	CAT II ILS
		RA 111′ DA(H) 5470′(100′)
R75m	R175m	R300m

SCENARIOS INVOLVING THE AVAILABILITY OF STATE-PROVIDED AOM FOR TAKE-OFF

States may provide visibility minimums for take-off or not. The table below shows the rules which are applied to determine the take-off visibilities:

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GLOBAL APPLICATION OF NEW AERODROME OPERATING MINIMUMS (AOM) CONCEPT

Scenario	Rules
States provide visibilities for with and without operational runway lights *(depending on lighting conditions, like HIRL + CL, CL, RCLM, etc.)*	– State-provided visibilities will be charted.
States provide visibilities for operational runway lights *(lowest possible visibilities for best lights, no visibilities for other conditions)*	
States provide visibilities without lights	
States do not provide any visibilities for take-off	– Visibilities will be determined according to ICAO AWOM.

Visibilities will always be labelled as R (= RVR), V (= VIS), C (= CMV) or as R/V (= RVR and/or VIS).

Samples

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Std	TAKE-OFF 1						
HIRL & CL (spacing 15m or less) & relevant RVR	RL & CL & relevant RVR	RL & CL	RL & RCLM	RL or CL	RL or RCLM	Adequate Vis Ref	
			DAY	NIGHT	DAY	DAY	NIGHT
TDZ R125m Mid R125m Rollout R125m	TDZ R150m Mid R150m Rollout R150m	R200m	R300m		R400m	R/V500m	NA
1 RWY 18, 25L, 25R: TDZ/Mid/Rollout R75m with approved lateral guidance system.							

Std	TAKE-OFF 1						
HIRL & CL (spacing 15m or less) & relevant RVR	RL & CL & relevant RVR	RL & CL	RL & RCLM	RL or CL	RL or RCLM	Adequate Vis Ref	
			DAY	NIGHT	DAY	DAY	NIGHT
TDZ R4 Mid R4 Rollout R4	TDZ R5 Mid R5 Rollout R5	R6	R10		R12	R16 V1/4	NA
1 RWY 18, 25L, 25R: TDZ/Mid/Rollout R3 with approved lateral guidance system.							

CEILING

A Ceiling will only be charted for straight-in landing, circle-to-land or take-off minimums if prescribed by the State authority as a parameter of the AOM they provide.

SUPPLEMENTAL AOM TEXT PAGE LISTINGS

At certain airports, supplemental AOM text page listings (like 10-9S pages) have been published in order to accommodate the needs of operators who require operating minimums that differ from the AOM as depicted on the Standard Airway Manual charts.

With the implementation of the new Standard AOM concept most of these supplemental minimums pages might become obsolete and will be removed accordingly.

However, the supplemental AOM text pages might still be required for airports where the State published minimums are lower than the AOM concept which is used by a specific operator.

An operator, who still needs supplemental AOM text pages, has to define the affected airports and has to provide the AOM rules, same as for the current procedure.

IMPLEMENTATION PLAN

ICAO Annex 6 requires that the operator establishes airport operating minimums for each airport to be used. This method needs to be approved by the State of the operator.

The publication of this Briefing Bulletin and the description of the new Standard AOM concept allows you to become familiar with the changes and to analyze the impact on the operations before the new concept is applied to the Airway Manual.

Jeppesen plans to start the publication of the new Standard AOM in **January 2020**.

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GLOBAL APPLICATION OF NEW AERODROME OPERATING MINIMUMS (AOM) CONCEPT

All charts of an airport will be converted to the new concept at the same time. The conversion will be done together with regular revision activities.

For customized charts we continue to determine the minimums according to the minimums specifications which are agreed by the customer, only the depiction of the minimums box will be changed to the new format.

Airports will be converted according to the priorities below:

a. Airports with pure ECOMS minimums where no State-provided minimums are available.
   Existing 10-9S charts will be deleted during conversion.
b. Airports where ECOMS and State-provided minimums are charted.
   Minimums will be converted to “State” and existing 10-9S pages will be updated to show the higher of State and EASA AIR OPS.
c. Airports where “Standard”, “Standard/DGCA”, “TERPS” or “JAR-OPS” minimums are charted.
   These airports see almost no changes to the minimums, except the change to the new format.

DOCUMENTATION

A detailed description of take-off and landing minimums based on the rules from ICAO AWOM and their application on Jeppesen charts will be added into the Airway Manual (AWM) and to our web site www.jeppesen.com/aom.

The following documents are available with revision 23 AUG 19:

– Briefing Bulletin JEP 19-A;
– Jeppesen ATC-Chapter “Aerodrome Operating Minimums - Jeppesen” describing the rules and tables for the new concept;
– Table comparing ICAO Doc 9365 AOM rules against EASA AIR OPS, Indian CAR, TERPS and EU-OPS/CAR-OPS as part of the Jeppesen ATC chapter as mentioned above.

The following documents will be made available before January 2020:

– AOM scenarios and expected changes when converting to the new AOM concept (web site);
– State overview table to indicate which minimums concept will be applied for which State (web site);
– Airport & Approach Chart Legend for take-off and landing minimums (Airway Manual and web site).

Inquiries related to this Bulletin may be submitted through established customer support channels.

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EXPLANATION OF AIRPORT MOVING MAP & AIRWAY MANUAL AIRPORT/TAXI CHART PUBLICATION CYCLES

Data extract cycles coincide with the AIRAC 28-day cycles used by Civil Aviation Authorities worldwide. This includes Jeppesen's Airport Mapping Database (AMDB) extracts that support Airport Moving Map (AMM) displays. All airport-related changes applicable to AMDB (additions, changes and deletions) to be effective on a given AIRAC cycle date are included in the data extract. Examples include physical changes to runways, taxiways, ramps, parking gates, as well as changes to runway, taxiway, or gate markings.

Also included are interim changes based on NOTAMs or other official means that span at least one AIRAC cycle. In certain cases, NOTAM changes that do not cover an entire AIRAC cycle but terminate close to the cycle end date may be applied.

Jeppesen's pre-composed Airway Manual chart customers can choose between 14- and 7-day chart revision updates. As a result, certain chart-related interim changes may be issued more quickly rather than the next 28-day cycle of the AMM. Additionally, Airport and Taxi charts are updated for other items besides surface features. Examples include modifications to ATC communication frequencies, approach and runway lighting details, declared distances, take-off and alternate minima, textual departure procedures, cultural features, and airport-related notes.

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In some cases Airport/Taxi charts may not be revised immediately for minor changes and these changes will be communicated via a Chart Change Notice. Even though there are situations that may result in AMM displaying more up-to-date information, the pre-composed charts – in addition to the relevant Chart Change Notices – should always be used as primary reference given the completeness of the information. The AMM display should be used as a supplement to the Airport/Taxi charts which is particularly useful in improving situational awareness during ground operations.

In regards to the features depicted on the AMM display such as NOTAMs which may not be available on the pre-composed chart due to the dynamic nature of the data, it is recommended to refer to the AMM display and NOTAMs provided by your operations or via an official government authority. For further details pertaining to the application of NOTAMs to pre-composed charts, refer to Briefing Bulletin JEP 09-B dated 10 JUL 09. The bulletin is available within standard Jeppesen Airway Manual.

Should a discrepancy occur between Jeppesen products and official approved sources, the nature of the discrepancy, including the impact on operations, is analyzed by Standards department. The decision to issue an AMM Alert is made in accordance with established Alert criteria. In certain cases, minor issues do not qualify the discrepancy as an Alert and will not be published as an AMM Alert.

Jeppesen continues to work toward unification and synchronization between both products' process criteria in order to provide consistent updates regardless of the service demanded by the customer.

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CHART DESIGN ENHANCEMENTS FOR MILITARY CHARTS

PURPOSE

The purpose of the bulletin is to announce enhancements to Jeppesen charts at military and joint use locations. The description below shall enable the user to familiarize with the upcoming changes.

BACKGROUND

In the past, Jeppesen procedure charts were primarily designed for the use by civil aviation operators. Going forward, the depiction of military procedures at military and joint use civil/military airports will put increased focus on the needs of military pilots. With the introduction of several additional features and specification changes, this chart enhancement initiative will improve the usability of Jeppesen charts for military operators.

The new chart specifications outlined below will first be released at DoD procedure charts being added to the Jeppesen chart library starting in September. Existing military procedure charts will be transitioned to the new specifications over time as part of the revision process.

ENHANCEMENTS

UHF COMMUNICATIONS

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Ultra High Frequency (UHF) communications added at sole military and joint use, civil/military, locations.

ATIS	NEW ORLEANS Approach (R)		NAVY NEW ORLEANS Tower		Ground	
279.55	123.85	256.9	123.8	340.2	121.6	270.35

NAVAID SYMBOLS

Navaid symbols used will be those that are consistent with ICAO recommended symbols.

Type	TACAN	VORTAC	VOR DME	VOR	DME	NDB
Non Compulsory						
Compulsory						

NAVAID BOXES

- Navaid boxes enhanced to include channel information and VHF frequency.
- Frequency/channel in the navaid box provides course guidance or formation radials.
- Frequency pairings designated in parenthesis.

	TACAN procedure based on VORTAC or TACAN Navaid	VOR DME or TACAN ; VOR or TACAN procedure based on VORTAC Navaid	VOR DME procedure based on VORTAC or VOR DME Navaid	ILS DME ; LOC DME procedure
Navaid Box	(XXX.XX) XXXX D (H) CH XXX XXX	XXXX D (L) XXX.X XXX CH XXX	(CH XXX) XXXX D XXX.X XXX	(CH XXX) XXX XXX XXX° XXX.X IXXX

(Navaid boxes are not shadowed if they do not provide course guidance on final)

OFF CHART NAVAID DEPICTION

- Navaid type identified.
- Frequency/channel *not* in parenthesis provides course guidance or radial formation information.
- Frequency pairing designated in parenthesis.

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CHART DESIGN ENHANCEMENTS FOR MILITARY CHARTS

ABC
VOR DME
111.0
(CH 47X)
090°→

ABC
VORTAC
111.0
CH 47X
090°→

ABC
TACAN
CH 47X
(111.0)
090°→

CROSSING ALTITUDES IN THE CHART PLANVIEW

Altitude restrictions in the planview of charts will be enhanced in the following manner:

– Altitude crossing restrictions shown blue in color.
– Over-bar/under bars used to indicate the type of altitude restriction, following ICAO guidance.
– Between Altitudes/Flight Levels

10000 FL100
8000 FL80

– Minimum Altitude/Flight Level

8000 FL80

– Maximum Altitude/Flight Level

10000 FL100

– Mandatory or At Altitude/FL

8000 FL80

– Altitude/FL indicated by state source as recommended will be charted without over-bar and under-bars

8000 FL80

SPEED RESTRICTIONS IN THE CHART PLANVIEW

Speed restrictions in the planview on charts at military locations and joint use locations shown using magenta color.

– Speed restrictions that apply to a specific navaid, intersection/waypoint; track segment, will be placed next to, or tied to the element.

MAX 250 KT
MIN 210 KT
AT 230 KT

Between
260 - 280 KT

INSTRUMENT PROCEDURE DESIGN INDICATOR

In addition to indicating TERPS, PANS-OPS and MIPS, a NATL Procedure Design Indicator label will be added to applicable procedures.

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CHART DESIGN ENHANCEMENTS FOR MILITARY CHARTS

A NATL label represents a procedure designed according to ICAO (8168 guidance), PANS OPS criteria, but the state has filed an exception to the design criteria for one of the following: Final approach segment, missed approach segment or the circling area.

Example: Final; missed approach based on PANS OPS and the circling area has an exception filed to the PANS OPS criteria. Therefore, the chart would indicate a NATL label.

Additionally, if the procedure AIP indicates the procedure design was based on mixed criteria, TERPs and PANS OPS, the chart would indicate a NATL label.

NOTE: If a procedure has a NATL label, the AIP should be reviewed to determine the exception the state has filed to the design criteria.

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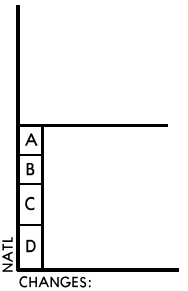
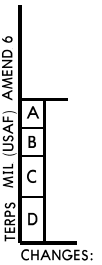


OPR (OFFICE OF PRIMARY RESPONSIBILITY) LABEL

An OPR label will be included on *all* military procedure charts:

MIL (USAF) – procedures designed by the United States Air Force
MIL (USN) – procedures designed by the United States Navy
MIL (USA) – procedures designed by the United States Army
MIL – Any procedure based on a Host Nation military AIP

NOTE: If a procedure does not include an OPR label, the Host Nation has designed the procedure.



MINIMUMS

– CAT E or HPMA minimums depicted when provided by source.
– Minimums depicted in the new Aerodrome Operating Minimums Format (AOM), refer to briefing bulletin JEP 19-A dated August 23, 2019 on Jeppesen.com publications for additional information.

NOTE: Ceilings depicted on charts with a USAF, USN or USA OPR label apply only to military operators. Military pilots should refer to appropriate regulations.

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CHART DESIGN ENHANCEMENTS FOR MILITARY CHARTS

TERPS MIL (USAF) AMEND 4

Military	STRAIGHT-IN LANDING MDA(H) 360′ (344′)		C Max Kts	CIRCLE-TO-LAND MDA(H)	
		ALS out			
A	400′-V1/2	400′-V1	90	500′(463′)	500′-V1
B			120		
C	400′-V 3/4		140	600′(563′)	600′-V1 1/2
D			165	600′(563′)	600′-V2
E			200	740′(703′)	800′-V2 1/2

IMPLEMENTATION PLAN

– Jeppesen will begin adding approach procedures in the enhanced format and specifications beginning September 2020.

– Existing approach charts at military and joint use civil and military locations will be updated over time as part of the revision process.

CONTACT INFORMATION

– Inquiries related to this Bulletin may be submitted through established customer support channels or your account representative.

– Questions concerning the Jeppesen chart, or Electronic Chart Images, please contact Chart Support:

+01 (303) 328-6776 (Western Hemisphere)

+49 (6102) 50-8174 (Eastern Hemisphere)

U.S. Toll Free: 1-800-353-2107

E-mail: ChartSupport@jeppesen.com

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CHANGES OF EASA AIR OPERATIONS (EASA AIR OPS) MINIMUMS - EFFECTIVE 30 OCTOBER 2022

PURPOSE

The purpose of this Bulletin is to provide a general overview of the forthcoming changes of EASA Air Operations (EASA Air Ops), effective 30 October 2022. In addition, this Bulletin addresses the way in which JEPPESEN determines and applies Aerodrome Operating Minimums (AOM) for landing and take-off to its library of the Instrument Approach Procedures which use EASA Air Ops as its AOM concept.

BACKGROUND

On 5 October 2012 the Commission Regulation (EU) No 965/2012 and related documents were published, laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.

Effective 30 October 2022, the European Aviation Safety Agency (EASA) revised selective regulations on Air Operations with the associated decisions containing Acceptable Means of Compliance (AMC), Guidance Material (GM) for PART-CAT (Commercial Air Transport Operations, Amendment 21) and PART-SPA (Specific Approvals, Amendment 12).

Doing so, a performance-based, 'technology-neutral' approach to the regulation of all-weather operations was introduced, which aims at facilitating a better integration and use of new, advanced technology as well as new operational procedures by ensuring the availability of aerodrome infrastructure, information, and procedures to support those.

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MAJOR CHANGES:

Based on the published AMC and GM amendments the following overview lists major items impacting the way JEPPESEN determines AOM for landing and take-off for locations using EASA Air Ops based AOM, effective 30 October 2022. Details are explained in the Introduction and ATC pages listed below and distributed within this revision.

a. Low Visibility Take-off operations (LVTO):
   - Requirement of Low Visibility Procedures for take-off operations below RVR 550m and operator approval for LVTO below RVR 400m.
   - Addition of selective required lighting facilities for LVTO below RVR 400m.
   - Removal of LVTO with RVR 200m.
     - Take-off minimum boxes on JEPPESEN CHARTS will be modified to reflect these changes.

b. Standard CAT I, APV and NPA
   - Additional consideration of instrument runway type (precision approach vs. non precision approach) for minimum DH and RVR requirements.
   - Introduction of 3D and 2D by consideration of Visual and Non-Visual Aids and/or On-Board Equipment for minimum RVR requirements.
     - CAT I and APV minimums on JEPPESEN CHARTS will consider the runway type deriving DH and RVR.
     - NPA minimums on JEPPESEN CHARTS will consider the runway type deriving DH/MDH and RVR and differentiate between 3D and 2D RVR requirements.

c. Standard CAT II and Standard CAT III operations:
   - Opening of CAT II operations allow for different type of approach technologies other than ILS.
   - Differentiation between CAT IIIA, CAT IIIB and CAT IIIC operations no longer exist. Replaced with CAT III operations.
     - CAT III minimums on JEPPESEN CHARTS will remove minimums relating to the subdivision unless still required by State.
   - Dependence of CAT III RVR on Roll-out control/guidance system. With no Roll-out control/guidance system, the RVR is lowered from 200m to 175m.

d. Operations with Operational Credits:
   - Introduction of Special Authorization (SA), SA CAT I and SA CAT II operations.
     - Unless source provided, SA CAT I and SA CAT II procedures will not be part of the JEPPESEN standard chart library.
   - Removal of LTS CAT I and OTS CAT II operations.
     - As long as source provided, OTS CAT II procedures will remain in the JEPPESEN standard chart library for a transitional period until replaced by SA CAT II procedures.
     - There are no LTS CAT I procedures in the JEPPESEN standard chart library.

e. Circling operations:

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CHANGES OF EASA AIR OPERATIONS (EASA AIR OPS) MINIMUMS - EFFECTIVE 30 OCTOBER 2022

- Removal of the requirement to compare circling visibilities against the RVR/VIS values of the preceding instrument approach procedure. The comparison for MDH remains a requirement.
  - The note referring to preceding instrument approaches will be adjusted accordingly.

DOCUMENTATION AND IMPLEMENTATION PLAN

The publication of this Briefing Bulletin and the below listed documents allows customers to become familiar with the changes and to analyze the impact on the operations prior to the effective date and their application to the Jeppesen Airway Manual on 30 October 2022.

With revision 9 September 2022, the following documents (effective 30 October 2022) will be published within the Jeppesen Airway Manual:

- Aerodrome Operating Minimums – EASA AIR OPS Effective 30 October 2022 (General and Aeroplane Specific Material) (referred to as “ATC-pages”) summarizing the relevant parts of the EASA Air OPS regarding the method used to determine Aerodrome Operating Minimums (Rules, AMC or GM);
- Chart Legend - EASA AIR OPS AERODROME OPERATING MINIMUMS (AOM) Effective 30 October 2022 (Introduction - 221 and following pages) providing information how JEPPESEN determines, applies and depicts Aerodrome Operating Minimums (AOM) for landing and take-off to its library of Instrument Approach Procedures applying EASA AIR OPS after 30 October 2022.

DRAFTS of both documents are already made available on the Jeppesen Website (https://ww2.jeppesen.com/publications/) and will be replaced with the final versions once published.

In addition, a Chart Alert will be published referring customer to the above listed documents and this Briefing Bulletin JEPP 22-A/A1.

Jeppesen will start the publication of the revised Aerodrome Operating Minimums effective 30 October 2022.

- Resulting more restrictive minimums will be communicated by Chart Alert effective 30 October 2022. Affected charts will be revised **28 October 2022, eff 3 November 2022**.
- Resulting lower minimums or omissions will be transitioned over time as part of the normal revision activities.

For customized charts we continue to determine the minimums according to the minimums specifications which are agreed by the customer, only the depiction of the minimums box will be changed to the new format.

OPERATOR REQUIRED ACTIONS

Both documents are not intended to provide aircraft or aircrew requirements or operating procedures or to provide all the requirements of the EASA Air OPS related documents. The publication of EASA Air Operations landing and take-off minimums on JEPPESEN charts does not constitute authority for their use by every operator.

Each individual operator is responsible for validating that the appropriate approval has been obtained for their use and we advise to review the forthcoming changes in this respect.

Inquiries related to this Bulletin may be submitted through established customer support channels.

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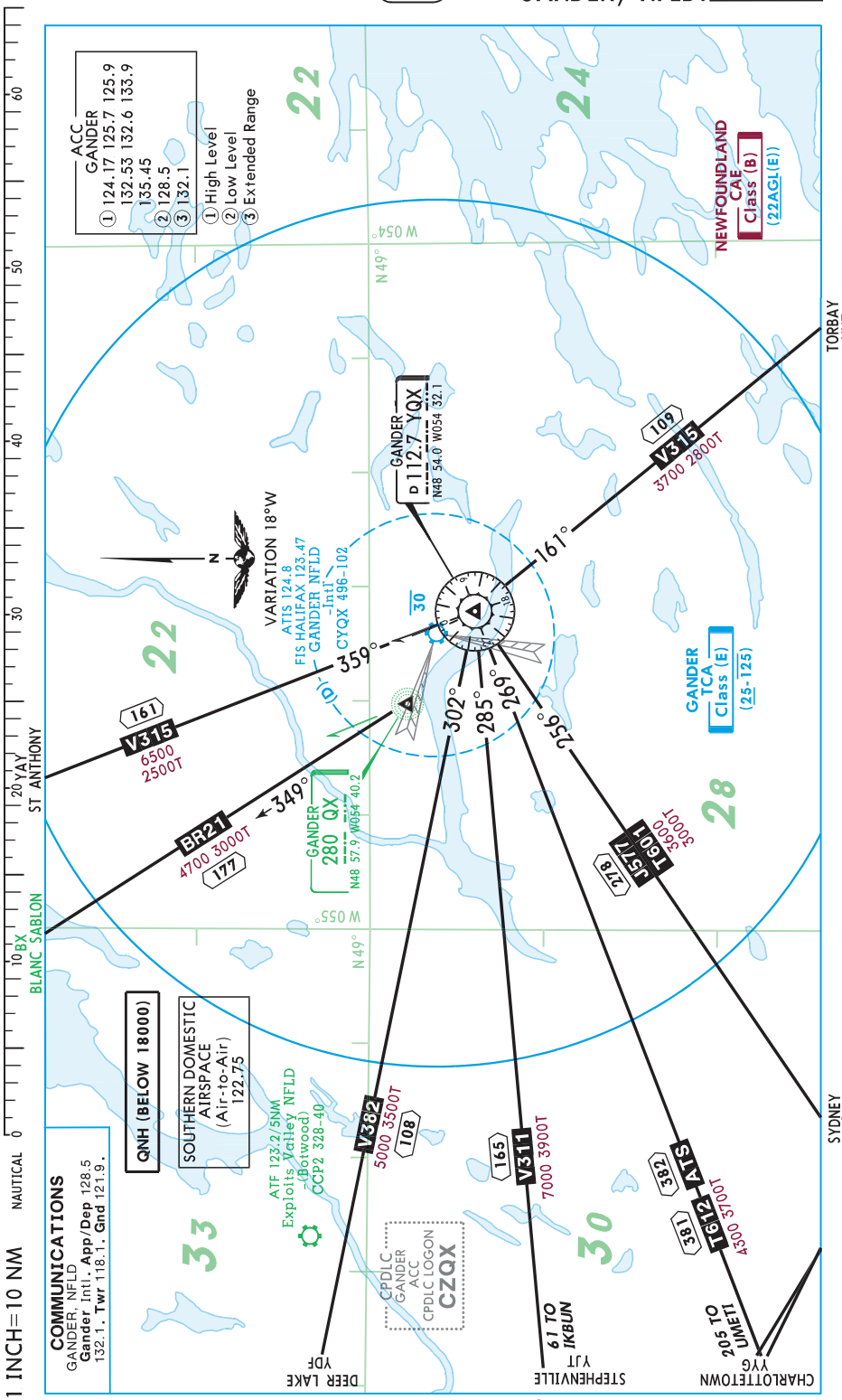

CHANGES: ATS system.

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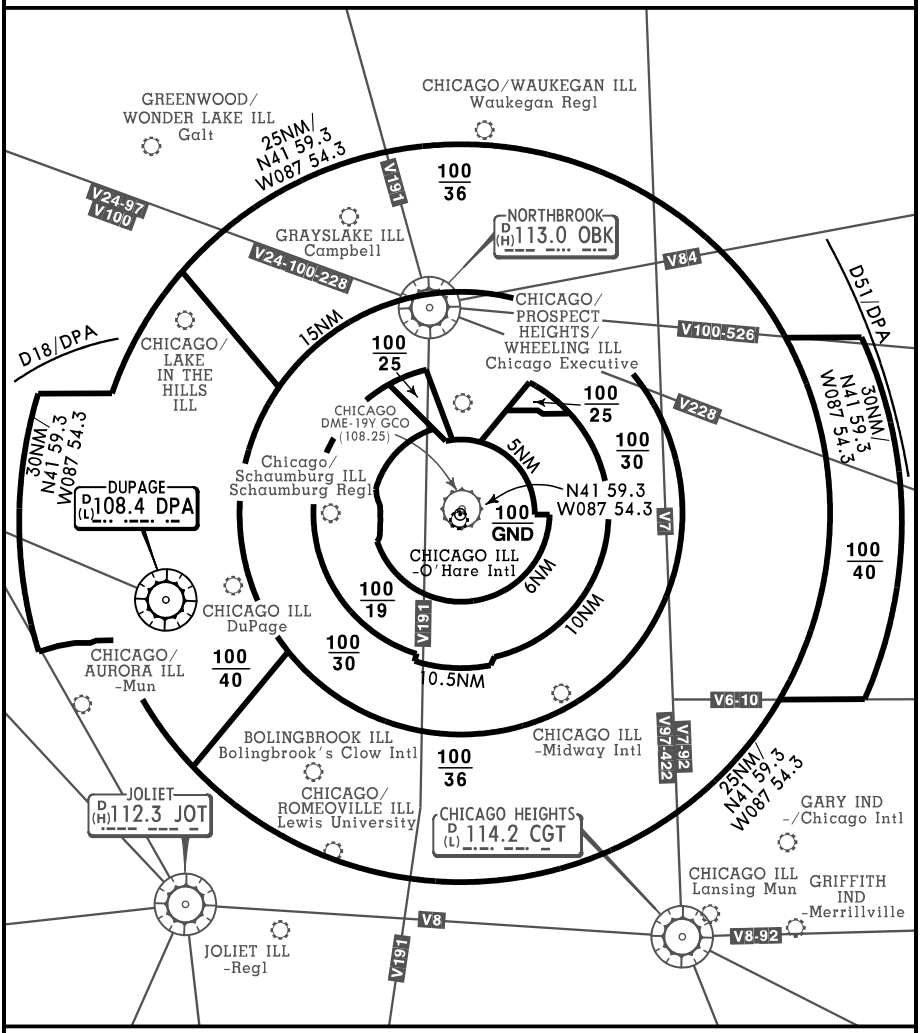
CHICAGO CLASS B AIRSPACE

CLASS B AIRSPACE VFR COMMUNICATIONS

(360°-179°) **Chicago App (R)** 119.0 (180°-359°) **Chicago App (R)** 133.62



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. Aircraft departing from other than the primary airports whose route of flight would penetrate the Class B Airspace should give this information to ATC on the appropriate frequencies.

c. Aircraft desiring to transit the Class B Airspace must obtain an ATC clearance to enter the Class B Airspace and will be handled on a ATC workload permitting basis.

CHANGES: ATS system.

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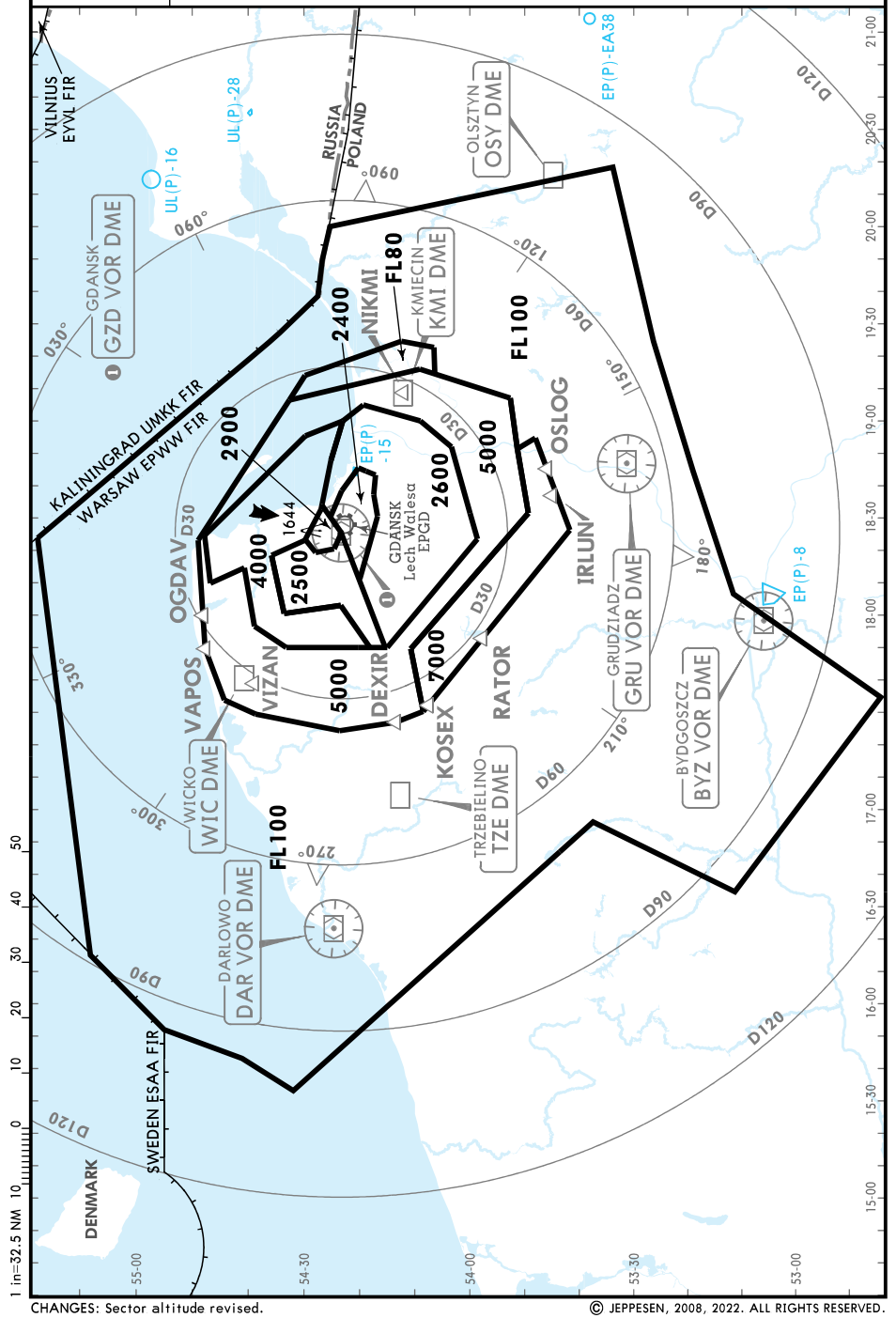
Apt Elev	
489	Alt Set: hPa (MM on req) Trans level: By ATC Trans alt: 6500 1. Chart may only be used for cross-checking of altitudes assigned while the aircraft is identified. 2. Minimum Vectoring Altitudes are temperature corrected down to -10°C. 3. Minimum Vectoring Altitudes sectors do not constitute controlled airspace.



CHANGES: Sector altitude revised.

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1. GENERAL

1.1. ATIS

D-ATIS 128.65
127.6 (Chinese)

1.2. WAKE TURBULENCE RE-CATEGORIZATION (RECAT-CN)

For RECAT-CN Separation Standards see ATC pages.

1.3. LOW VISIBILITY OPERATIONS (LVO)

1.3.1. LVO CRITERIA

RWY 01 meets LVO CAT II operating standards, RWY 36R meets LVO CAT II/IIIA operating standards.

During LVO CAT III operation, all arrival ACFT shall apply to APN or TWR for Follow-me.

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During LVO CAT II operation, arrival and departure ACFT can apply to TWR for Follow-me.

When VIS is less than 800m or RVR of any RWY that can implement LVO is less than 550m, or when ceiling is less than 60m TWR will implement LVO procedures.

When RVR of RWY 36R is lower than 300m, and shows downward trend, TWR will implement CAT IIIA operation and select the RWY according following rules:

RVR (m)	RWY 36L	RWY 36R	RWY 01
550-400	take-off	take-off, landing	take-off, landing
400-300			
300-200			take-off
200-175		HUD take-off, landing	HUD take-off
175-150		HUD take-off	
150-90			

1.3.2. LOW VISIBILITY TAKE-OFF BASED ON HUD

RWY 36R conducting take-off with RVR 150m based on HUD and RWY 01 conducting take-off with RVR 90m based on HUD shall satisfy following conditions:

- Special authorization for airlines, on-board HUD and crew members.

When conducting LVO, flight crew shall pay attention to ATIS and do self-check of HUD capabilities and weather conditions.

Flight crew shall report to ATC when applying for delivery clearance if it is capable of HUD take-off.

Flight crew will decide whether departure or not before entering into RWY according to the actual RVR situation. If flight crew decide to continue departing or taxiing back, Follow-me vehicle will detach or guide ACFT back.

All ACFT conducting take-off with HUD shall taxi on fixed route and be guided by Follow-me. For fixed routes refer to 10-9 charts.

During RWY 36R CAT IIIA operations, without any TWR permission, ACFT are forbidden to enter:

- TWY F (South of M7, including TWYs F0 thru F4, F7 between TWY F and TWY Z3).
- TWY G (South of T5, including TWYs T1 thru T4, G3 thru G7, W0, W2 thru W4, E0 thru E6, A0 and A1 between TWY G and TWY H).

During RWY 01 conducting HUD RVR 90m take-off, without any TWR permission, ACFT are forbidden to enter:

- TWY K (South of TWY K7, including TWYs T1 thru T6, K3 thru K6, Y4, Y6, Q0 thru Q7 between TWY K and TWY J).

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1. GENERAL

1.4. RWY OPERATIONS

General rules for use of RWYs:

- RWY 01/19 is mainly used for arrival.
- RWY 18L/36R is mainly used for departure.
- RWY 18R/36L is used for departure and arrival.

The three parallel RWYs will be used for departure upon departure rush hour.

The three parallel RWYs will be used for arrival upon arrival rush hour.

Daily from 2330-0530LT, landing on RWY 01 and take-off on RWY 19 prohibited.

During changing the direction of RWY-in-use, if downwind speed is more than 3m/s (6 KT) and not exceeding 5m/s (10 KT), ATC shall inform ACFT about ground wind direction and speed and instruct downwind take-off or landing for short time. If pilot decides not to take off or land on downwind RWY due to performance limits, inform ATC immediately.

1.5. TAXI PROCEDURES

For taxiing routings refer to 10-9 charts.

180° turnaround on TWYs is strictly forbidden.

Take-off and landing ACFT shall keep ADS-B equipment on while taxiing.

Set transponder on mode Sierra while taxiing.

RWY 18L/36R crossing rules:

- TWYs A0, A1, A8, A9 are available for crossing RWY 18L/36R.
  - Taxi following the instruction of GND Control to the holding position and hold short of RWY 18L/36R.
  - Request TWR Control for crossing clearance.
  - Verify any questions prior to crossing.
  - Repeat all the ATC instructions for clarity, then put in practice as soon as possible.
  - Finally, report to TWR Control "RWY vacated".

Flight crew shall monitor the TWR freq and watch the activities on the RWY 18L/36R and around.

ACFT shall finish RWY crossing and fully vacate RWY within 50 seconds after receiving ATC instructions of crossing RWY.

If flight crew consider that they can not fulfill the process within the required time, pilot shall inform TWR ATC controller before reaching the RWY holding point.

Requirements for flight crew:

- Listen carefully and read back the taxi instructions of Apron controller, especially for boundry-related instructions, verify any questions in time.
- Report to controller "Approaching to XX TWY, request to change to XX frequency" before reaching at handover point.

While crossing RWY 18L/36R after the take-off ACFT, flight crew shall be responsible for the safety distance with the ACFT to avoid the effect of wake turbulence.

If failure to change the assigned GND frequency, stop prior to the intersection of the two GND sectors and contact the original GND frequency.

When a stop bar is extinguished but the centerline lights beyond the stop bar are not illuminated, or a conflict occurs between stop bar and ATC guidance, DO NOT cross the stop bar and contact ATC to reaffirm.

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1. GENERAL

When a stop bar cannot be extinguished due to malfunction, radio communication will be used as follows:

a. Controller: (ACFT ID) stop bar unserviceable, cross red stop bar at (TWY number).
Pilot: Cross red stop bar at (TWY number), (ACFT ID).

b. Controller: (ACFT ID) stop bar unserviceable, cross red stop bar, via (TWY number) line up RWY (RWY number).
Pilot: Cross red stop bar, via (TWY number) line up RWY (RWY number), (ACFT ID).

Taxiing routes of special flight will be instructed by ATC.

Simultaneous taxiing on TWYs Y1 and Y2 (South part of TWY G1) is strictly forbidden.

When the mean wind speed reaches 10.8m/s or more at the APT, single engine taxi is strictly forbidden.

1.6. PARKING INFORMATION

Push-back required for all stands, except stands 251, 252, 261 thru 263, 816, 817, 951 thru 958, W103 thru W107 ACFT may taxi out by own power.

ACFT shall taxi in and be pushed back by tow tractors on stands 264, 267, 268, 622 thru 625, 630 thru 640, N110, N124, N128, N214, W101, W206, W301, W306, W501 thru 511, W612 thru W623. These stands are only available for ACFT parking, ground support activities such as passengers embarkation and disembarkation, refuelling, cargo loading and unloading is forbidden.

ACFT parking at business stands 636 thru 640 shall taxi in or be pushed back by tow tractor. Taxiing in and out by own power is strictly forbidden.

Visual docking guidance system available for stands 301 thru 337, 405 thru 410, 451 thru 466, 501 thru 536, 551 thru 556, 558 thru 565.

Wing lights of A330-200 are forbidden to turn on while rear door connecting with air bridge, contact Terminal Airfield Management Control Center for the clearance of turning on the wing lights and conduct after the air bridge retracted.

Taxi lights are forbidden to turn on unless the ground personnel have evacuated from the front of the taxi lights.

1.7. AUXILIARY POWER UNITS (APU)

APU alternative facility (include 400Hz power unit and ground air conditioner) using requirements.

For reducing carbon emission and noises, on stands 103, 104, 107 thru 111, 114 thru 116, 205 thru 240, 301 thru 337, 401, 403, 405 thru 411, 413, 451 thru 466, 501 thru 536, 551 thru 556, 558 thru 565, 701 thru 704, 711 thru 714, 721 thru 735, 818 thru 821, 931 thru 940, N101 thru N110, N121 thru N128, N201 thru N213, W201 thru W210, W301 and W311 shall follow the principle of 'use as much as possible', turn off APU and connect 400Hz power unit and ground air conditioner system.

Except for the following special situation, ACFT is forbidden to use APU during parking at above stands:

- 400Hz power unit and air conditioning system is unserviceable;
- ACFT needs APU to start up engine;
- APU is under maintainance;
- In case of exceptional circumstance influencing the regularity and safety of operation, such as extreme weather.
- In case of strong winds stop using ground air conditioners. The equipment connected to the ACFT shall be removed immediately.
- In lightning conditions, ground power and air conditioning equipment shall not be connected and removed.

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1. GENERAL

In order to improve the efficiency of APU alternative docking operation, Beijing Capital APT will provide APU alternative operation service by "default docking", i.e. after the ACFT has stopped, the maintenance personnel will give the permission to dock and start the equipment docking operation.

The docking operation will begin after the ACFT has stopped.

1.8. FUEL DUMPING AREA

For fuel dumping area refer to chart 10-3Z.

1.9. OTHER INFORMATION

RWYs 01 and 18R right-hand circuit.
Birds.

1.9.1. SIMULTANEOUS OPERATIONS ON PARALLEL RWYs

RWYs 36L, 36R and 01 may be used for dependent parallel ILS approaches.

RWYs 36L and 01 may be used for independent parallel approaches, if operating condition requirements are met.

All parallel RWYs may be used for independent parallel departures. In order to keep the safety separation, the ACFT departing from RWY 36R/18L shall follow SID or departure instruction after take-off. And it is forbidden to deflect to both sides. The ACFT departing from RWY 36L/18R or RWY 01/19 shall follow SID or departure instruction as soon as possible after take-off. And it is forbidden to deflect to RWY 36R/18L.

Landing ACFT shall vacate the RWY as soon as possible (within 50 seconds from flying over RWY THR to vacating the RWY), otherwise inform TWR controller before landing.

Upon receipt of APCH clearance, the pilot shall monitor the operating situations of other ACFT in the vicinity using airborne equipment such as ACAS and establish the visual separation as practicable. Then report "visual separation established" when the controller notifies the relative position to other ACFT.

1.9.2. RADAR CONTROL RULES

For ACFT with SSR transponder:

- Set to model A as required;
- Code and altitude should both set to open, except required by ATC;
- For ACFT with transponder malfunction (including non-display or display error), pilot shall report to ATC controller before entering BEIJING APP;
- ACFT without SSR transponder shall report to ATC before entering into BEIJING APP.

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2. ARRIVAL

2.1. COMMUNICATION FAILURE PROCEDURES

2.1.1. SELECTION OF RWY

RWY 36R used for Northbound operations, RWY 01 will be selected when RWY 36R not in service.

RWY 18L used for Southbound operations, RWY 19 will be selected when RWY 18L not in service.

2.1.2. SELECTION OF FLIGHT PATH

Follow STAR to IAF of landing RWY and execute ILS/DME approach.

2.2. SPEED RESTRICTIONS

- MAX 280 KT when flying below FL 197 (6000m) and above 9850′ (3000m).
- MAX 250 KT when flying at 9850′ (3000m) or below.
- MIN 180 KT until 8NM from touchdown point.
- MIN 160 KT until 6NM from touchdown point.

If these speed limitations can not be implemented, report to ATC as soon as possible.

2.3. NOISE ABATEMENT PROCEDURES

RWY 01/19 operation restriction for night noise control, landing ACFT perhaps shall circle for holding, suggest to increase reserve fuel capacity during 2330-0100LT daily.

2.4. CAT II/IIIA OPERATIONS

RWY 01 is approved for CAT II operations, RWY 36R is approved for CAT II/IIIA operations. Special aircrew and ACFT certification required.

2.5. TAXI PROCEDURES

Requirements as follows to increase RWY operation capacity (this does not apply to wet or contaminated RWY):

- ACFT shall finish fully vacating the RWY within 50 seconds (70 seconds for heavy type or above) after flying over RWY THR.
- If crew suppose they cannot fulfill the process within the required time, they have to inform ATC while they are contacting final frequency (no later than base turn or before establishing the LOC).

After vacating RWY, especially under conditions of low visibility, report the RWY designation and TWY designation on initial contact with GND.

TWY C4 is used by ACFT turn to North from TWY P4.

TWY C5 is used by ACFT turn to South from TWY P5.

Operation during Snow Weather

Arriving ACFT with 4 engines (or more) shall keep the outside engines in idle state after vacating RWY until entering into stand.

For APN control areas refer to 10-9 pages. ACFT taxiing and other operations in the APN control area shall follow instructions of APN.

ACFT within APN control area shall contact APN for stands information and further taxiing clearance before entering apron.

2.6. OTHER INFORMATION

2.6.1. INDEPENDENT APPROACHES EMERGENCY AVOIDANCE FOR RWY 01

- ACFT beyond 5.4NM/10km from RWY THR, radar-vectoring, contact BEIJING Approach.
- ACFT within 5.4NM/10km from RWY THR, climb and maintain 1970′/600m, turn RIGHT, heading 090°. Contact BEIJING Approach.

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2. ARRIVAL

2.6.2. EMERGENCY AVOIDANCE FOR RWY 18L

- ACFT climb along final course and maintain 6890'/2100m. Contact BEIJING Approach.

2.6.3. EMERGENCY AVOIDANCE FOR RWY 18R

- ACFT beyond 5.4NM/10km from RWY THR, radar-vectoring, contact BEIJING Approach.
- ACFT within 5.4NM/10km from TWY THR, climb and maintain 2960'/900m, turn RIGHT, heading 270°. Contact BEIJING Approach.

2.6.4. EMERGENCY AVOIDANCE FOR RWY 19

- ACFT beyond 5.4NM/10km from RWY THR, radar-vectoring, contact BEIJING Approach.
- ACFT within 5.4NM/10km from RWY THR, climb and maintain 1970'/600m, turn LEFT, heading 090°. Contact BEIJING Approach.

2.6.5. INDEPENDENT APPROACHES EMERGENCY AVOIDANCE FOR RWY 36L

- ACFT beyond 5.4NM/10km from RWY THR, climb and maintain 6890'/2100m, radar-vectoring. Contact BEIJING Approach.
- ACFT within 5.4NM/10km from RWY THR, climb and maintain 6890'/2100m, turn LEFT, heading 300°. Contact BEIJING Approach.

2.6.6. INDEPENDENT APPROACHES EMERGENCY AVOIDANCE FOR RWY 36R

- ACFT climb along final course and maintain 6890'/2100m. Contact BEIJING Approach.

2.6.7. INDEPENDENT VISUAL APPROACHES (IVA)

IVA may be used during parallel operations in RWY 36L/36R/01 or RWY 18R/18L/19 direction. Depending on meteorological conditions they may be initiated from a turning to final or from an ILS APCH once the pilot is visual.

Important instructions and advisory information for pilots:

- Report preceding ACFT and/or RWY in sight as soon as possible.
- ATC shall give IVA expectation and assigned RWY to flight crew at initial contact. If no objection, that has been accepted.
- Manage IAS on base leg to ensure you do not overshoot centerline and on final to keep the intervals between ACFT. Standard terminal area speeds apply, 180 KT 10NM from THR and 160 KT 5NM from THR. If flight crew cannot fulfil required speed, inform ATC immediately.
- Fly accurate headings when being vectored to final. The vector for final will not be greater than 30°.
- The phraseology will include "Cleared Independent Visual Approach".
- ATC will provide separations until cleared for a visual APCH. If ACFT is to follow a preceding ACFT to make the visual APCH, you will be responsible for the separation with the preceding ACFT, or you just have the RWY in sight to make the visual APCH but not the preceding ACFT, ATC will provide separations between you and the preceding ACFT.
- It is not necessary to apply any other type of separation with the other ACFT approaching on adjacent final after one ACFT is cleared for an IVA.
- Once the visual APCH has been issued and pilot has acknowledged receipt of the visual APCH clearance, the separation between ACFT and obstacles is in the charge of the flight crew.
- Do not pass through your assigned RWY centerline. Other ACFT will be operating on the adjacent APCH.
- ATC will provide type and wake turbulence category of preceding ACFT for all landing ACFTs which are tailing after heavy ACFTs and above (or B757).
- If necessary, ATC shall inform the traffic information of other relevant ACFT.
- Flight crew must respond to any TCAS alert in accordance with the procedures in the ACFT's flight manual.

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2. ARRIVAL

- Accurately track extended RWY centerline during final.
- If for any reason, including radio failure or radio congestion, contact cannot be established or maintained with final ATC such that it prevents an instruction being issued by ATC or a vectoring request being made by the flight crew to enable intercept of final APCH course for the RWY assigned, then an ACFT shall initiate a turn in order to track the extended centerline of the RWY assigned and contact TWR.
- All medium ACFTs and below shall fully vacate RWY within 50 seconds after touchdown, and all heavy ACFTs and above shall fully vacate RWY within 70 seconds after touchdown. If flight crew cannot fulfil the process within the required time, pilot shall inform ATC in advance.

2.6.8. PROCEDURES FOR VFR FLIGHTS

Visual separation can be implemented in Beijing Capital Intl APT. When using VFR separation on the final approach phase of IAPs, pilot shall follow the IAPs and keep visualizing to ensure a safety separation with other ACFT. When the ACFT descends to DA, some situations may be observed, such as the preceding ACFT is vacating the same RWY, or the departure ACFT is lifting off. Under such situation, pilot can make a missed approach at any moment if it is considered to be necessary and notify the controller immediately.

When visibility is not less than 6km, ceiling is not less than 600m, visual approach can be implemented in Beijing Capital Intl APT. ATC can conduct arrival ACFT of one or several RWYs to implement visual approach.

When pilot reports to ATC visual contact with APT, pilot or ATC can apply for visual approach and implement with mutual agreement.

When the pilot implements the visual approach indicates that another ACFT is in sight and accepts the visual separation, the pilot shall take the following responsibilities:

- Pilot shall maintain visual contact with relevant ACFT, make the necessary speed adjustment or maneuvering, and report flight operations to ATC if needed.
- Pilot shall keep ACFT away from wake turbulence affected area of preceding ACFT.
- When pilot cannot maintain visual contact with relevant ACFT, pilot shall report to ATC in order to get another available separation.

Pilot shall report to ATC in case of visual contact with APT but no visual contact with preceding ACFT in order for ATC to assign radar intervals or procedure intervals for the preceding and following ACFT.

During simultaneous approaches on parallel RWYs, ATC can conduct ACFT to implement visual approach on one RWY and ILS approach or visual approach on other RWYs.

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3. DEPARTURE

3.1. DEPARTURE CLEARANCE VIA DATA LINK (DCL)

DCL service provided by TWR will be put into use. Pilot shall request DCL 30 minutes in prior before ETD.

3.2. DE-ICING

3.2.1. GENERAL

Two ways applied for de-icing:

- De-icing at de-icing positions;
- De-icing at stands.

Contact TWR or AOC to confirm de-icing way.

When exiting de-icing stands, aircrew shall control throttle carefully, avoiding exhausted gas causing damage to support personnel and equipment.

If APU failure is detected for engine-off ACFT, aircrew shall report to TWR before push-back and contact AOC to apply for de-icing at parking stand and de-icing vehicle. When APU fails during de-icing at de-icing position, aircrew shall report to de-icing guide immediately and operate with suggestions.

3.2.2. DE-ICING AT DE-ICING POSITIONS

3.2.2.1. DE-ICING DEMAND

Before applying for delivery clearance, ACFT with de-icing demand shall report to AOC, then report to Delivery the de-icing demands.

3.2.2.2. PUSH-BACK AND TAXIING

ACFT shall follow ATC instructions to push back and taxi to de-icing holding position.

3.2.2.3. DE-ICING HOLDING

Refer also to 10-9 pages for depiction of de-icing areas and holding positions.

RWY	Corresponding De-icing Area	Holding Position Number	Light Guidance available	Line-up	De-icing Frequency (MHz)
36L	1 (W211 thru W213)	11	Yes	TWY Z2 (East of TWY Z7)	128.200
		12	Yes	TWY D1 (North of TWY C1)	
36R	2 (706 thru 710)	21	Yes	TWY Z9 (South of TWY F4)	128.200
		23	Yes	TWY Z3 (North of TWY F7)	
36R	3 (G1, G2, 371 thru 373)	31	Yes	TWY Y2 (South of TWY G1)	127.025
		32	Yes	TWY Y2 (North of TWY U6)	
01	4 (K1, K2, 381, 382)	41	Yes	TWY Y5 (South of TWY K1)	126.225
		42	Yes	TWY Y5 (North of TWY U9)	
18L/R	7 (W103 thru W107)	71	Yes	TWY D4 (South of TWY S4)	128.200
		72	Yes	TWY S4 (East of TWY D4)	
18L	8 (951 thru 954)	81	Yes	TWY H (South of TWY J5)	127.025
19	9 (955 thru 958)	91	Yes	TWY J (South of TWY J6)	126.225

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3. DEPARTURE

ACFT shall follow the light to the de-icing stands when "flight number, FOLLOW THE LIGHT" is displayed.

If the light guidance of the deicing holding position is not available, ACFT waiting at the deicing holding position shall follow the Follow-me vehicle to the deicing stands.

3.2.2.4. ENGINE IDLE DE-ICING

No marshaller guidance. Follow the guidance to de-icing stands.

Observe "STOP" sign on the ground at LEFT side (10m/33' of RWY centerline). When "STOP" sign at 9 o'clock direction of left pilot, brake and keep engine idle. When ACFT arrived de-icing holding position, aircrew shall change one VHF equipment according to table 3.2.2.3. and contact engine idle de-icing guide via VHF, then confirm de-icing/anti-icing demand with de-icing guide.

When ACFT parked already, keep idle set parking brake and do de-icing preparations.

99 During de-icing period, aircrew shall keep engine idle, ACFT is prohibited to get moved, and keep engine idle de-icing frequency on.

If aircrew fails to contact personnel via VHF, turn off engine and turn on all lights on ACFT to inform de-icing guide.

When de-icing is completed, obtain change frequency clearance from de-icing guide and contact APN applying for taxiing out of de-icing stand.

If engine turned off during engine idle de-icing, engine-off de-icing shall be implemented with the instructions of de-icing guide.

3.3. START-UP, PUSH-BACK AND TAXI PROCEDURES

Departure ACFT shall not apply for ATC delivery clearance 30 minutes earlier than ETD.

ACFT shall contact Aerodrome Delivery Control for departure clearance not earlier than 20 minutes prior to push out for engine start-up.

Fast engine run-ups in the vicinity of boarding bridges, on apron or TWYs are strictly forbidden.

For APN control areas refer to 10-9 pages. ACFT push-back, start-up, taxiing and other operations in the APN control area shall follow instructions of APN.

Within APN control areas ACFT pushing back shall:

- Obtain delivery, push-back and start-up clearance from delivery when ACFT standby.
- Flight crew shall inform stand number on initial contact with APN.
- ACFT shall push back and start up after APN clearance. Push-back direction and procedures shall be verified with APN. Follow APN instructions within 5 minutes, otherwise re-apply.
- Obtain taxiing clearance from APN after pushing back.

Requirements as follows to increase RWY operation capacity (this does not apply to wet or contaminated RWY):

- While preceding ACFT is departing or if RWY is not occupied, ACFT shall finish RWY alignment within 45 seconds (60 seconds for RWY 18L/36R) after receiving ATC instructions of entering RWY.
- While preceding ACFT is landing, ACFT shall finish RWY alignment within 50 seconds after receiving ATC instructions of entering RWY.
- If crew suppose they cannot fulfill the process within the required time, they have to inform ATC before reaching RWY holding point.

Operation during Snow Weather:
Departing ACFT with 4 engines (or more) shall keep the outside engines in idle state after pushing out until entering into RWY.

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3. DEPARTURE

3.4. NOISE ABATEMENT PROCEDURES

Beijing Capital uses NADP1 issued by ICAO.

Upon condition of ensuring the safety of flight, all pilots are required to execute the following noise abatement procedures:

Take-off to 500m (1650')	- Take-off power; - take-off flaps; - climb at V_2 + 20km/h (10 KT).
At 500m (1650')	- Reduce engine power to climb thrust and maintain the original flaps and speed.
At 950m (3120')	- Complete transition to normal enroute climb speed and retract flaps.

3.5. COMMUNICATION FAILURE PROCEDURES

3.5.1. WHEN CHOOSING TO RETURN

Follow SID to the last waypoint of the SID, select nearest STAR, join STAR at first waypoint to the IAF of the landing RWY, execute ILS/DME approach.

3.5.2. SELECTION OF FIRST WAYPOINT

Select first waypoint of STAR at the respective last waypoint of SID:

IDKEX	turn RIGHT and fly to OSUBA
DOTRA	
MUGLO	turn RIGHT and fly to DUMAP
IGMOR	
ELKUR	turn RIGHT and fly to AVBOX
RUSDO	turn RIGHT and fly to GUVBA
BOTPU	

3.6. RWY OPERATIONS

TWR controller shall arrange the departure ACFT to use partial RWY to take-off. If the departure ACFT needs full RWY to take-off, contact controller upon receiving delivery clearance.

ACFT shall take off immediately after receiving take-off clearance by ATC, and keep watch on TWR frequency for further instructions.

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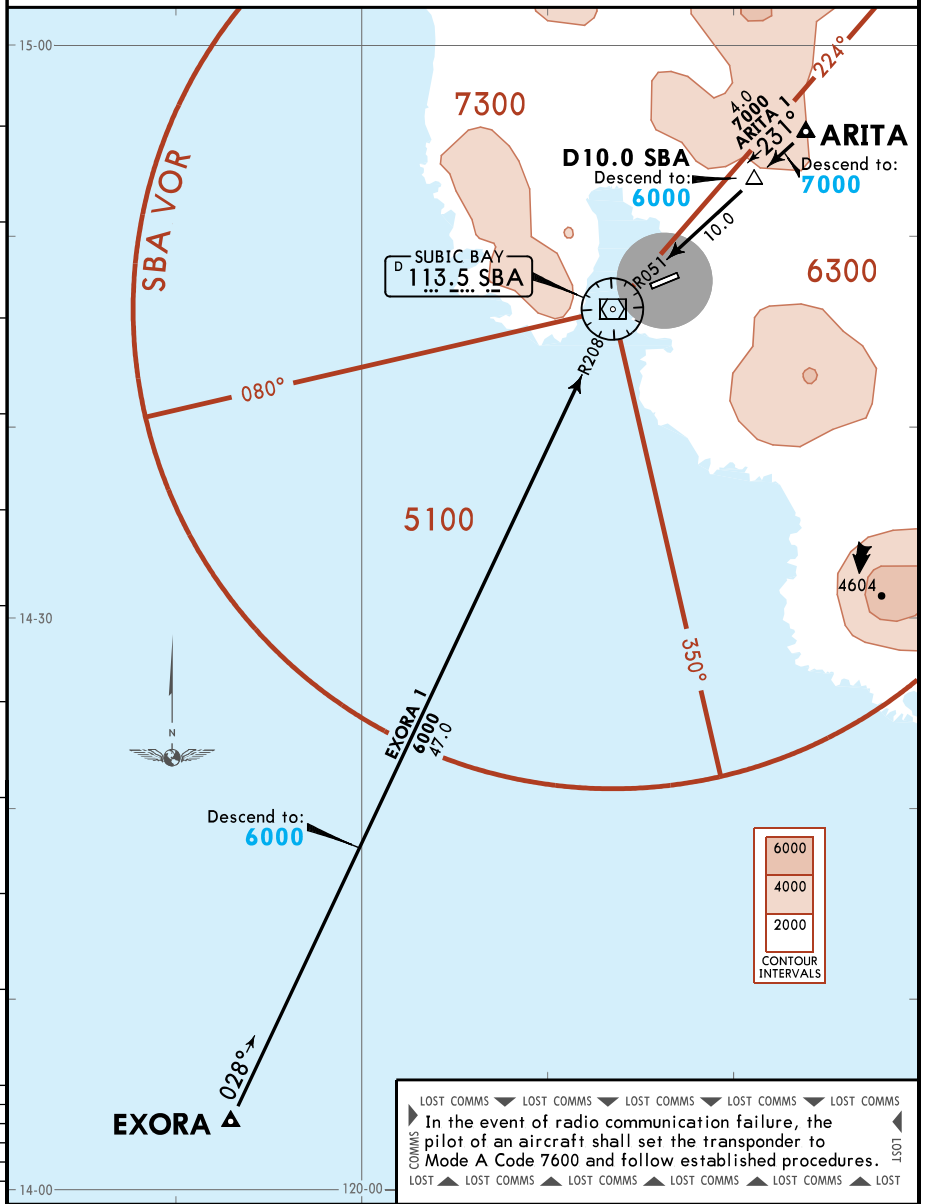
*ATIS	Apt Elev	Alt Set: hPa Trans level: FL130
134.4	59	

ARITA 1 [ARITA1]
EXORA 1 [EXORA1]
ARRIVALS
(RWYS 07, 25)



STAR	ROUTING
ARITA 1	At ARITA, track in on SBA R051 and descend to 7000. At D10.0 SBA, descend to 6000.
EXORA 1	At EXORA, track in on SBA R208 and descend to 6000.

1 in=10 NM

CHANGES: Procedures revised, MSA.

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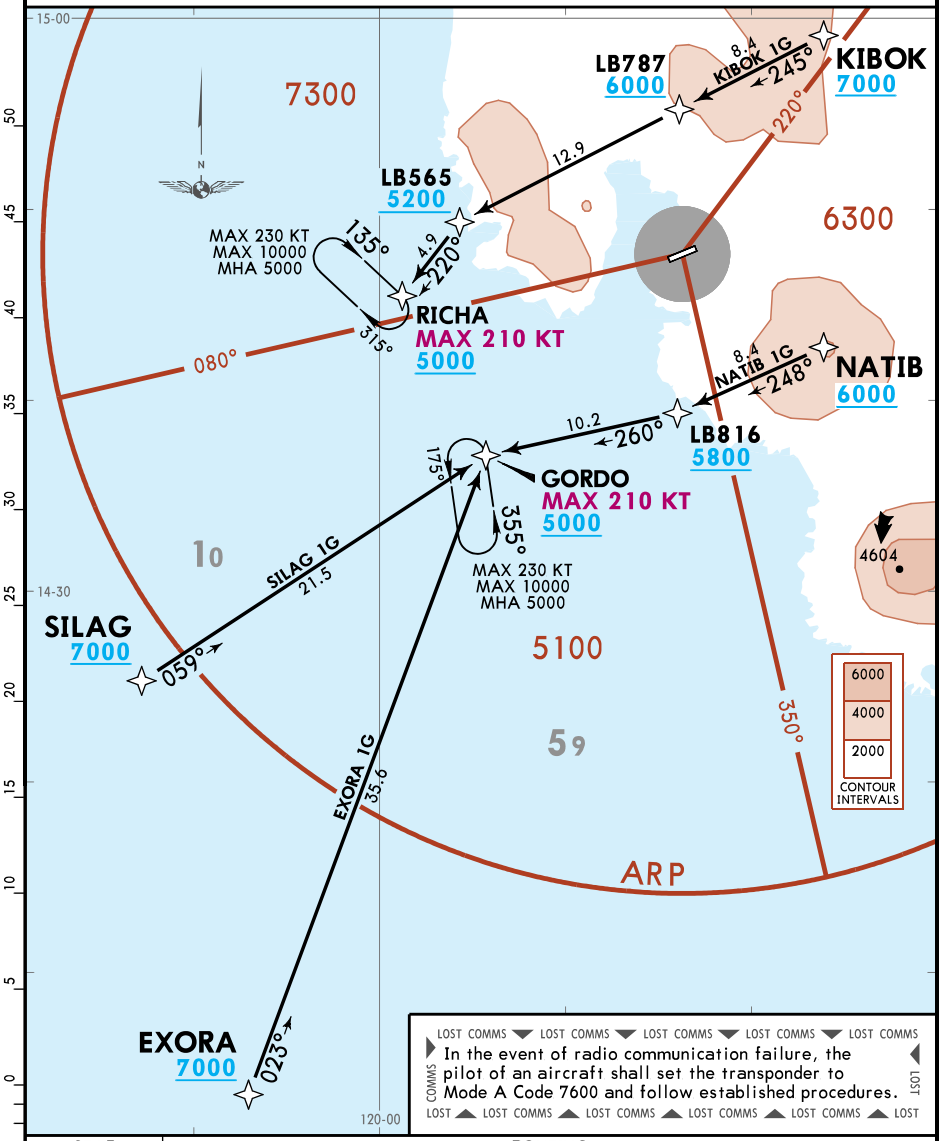
*ATIS	Apt Elev	Alt Set: hPa Trans level: FL130
134.4	59	RNP 1

EXORA 1G [EXOR1G], KIBOK 1G [KIBO1G] NATIB 1G [NATI1G], SILAG 1G [SILA1G] RNP ARRIVALS (RWY 07)



STAR	ROUTING
EXORA 1G	From EXORA at or above 7000, to GORDO at or above 5000.
KIBOK 1G	From KIBOK at or above 7000, to LB787 at or above 6000, to LB565 at or above 5200, to RICHA at or above 5000.
NATIB 1G	From NATIB at or above 6000, to LB816 at or above 5800, to GORDO at or above 5000.
SILAG 1G	From SILAG at or above 7000, to GORDO at or above 5000.

1 in=10 NM 5

CHANGES: Procedures revised.

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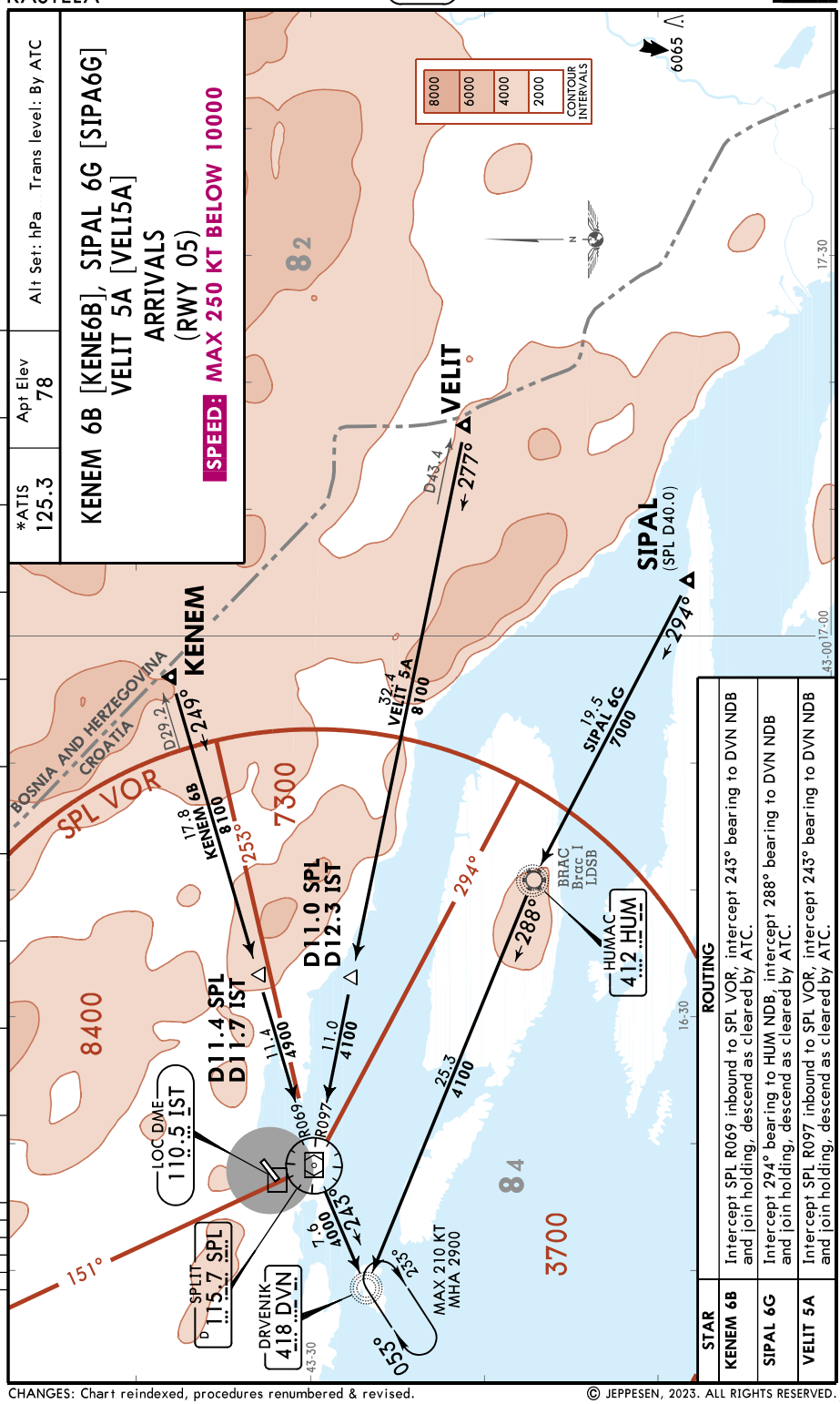

STAR	ROUTING
KENEM 6B	Intercept SPL R069 inbound to SPL VOR, intercept 243° bearing to DVN NDB and join holding, descend as cleared by ATC.
SIPAL 6G	Intercept 294° bearing to HUM NDB, intercept 288° bearing to DVN NDB and join holding, descend as cleared by ATC.
VELIT 5A	Intercept SPL R097 inbound to SPL VOR, intercept 243° bearing to DVN NDB and join holding, descend as cleared by ATC.

CHANGES: Chart reindexed, procedures renumbered & revised.

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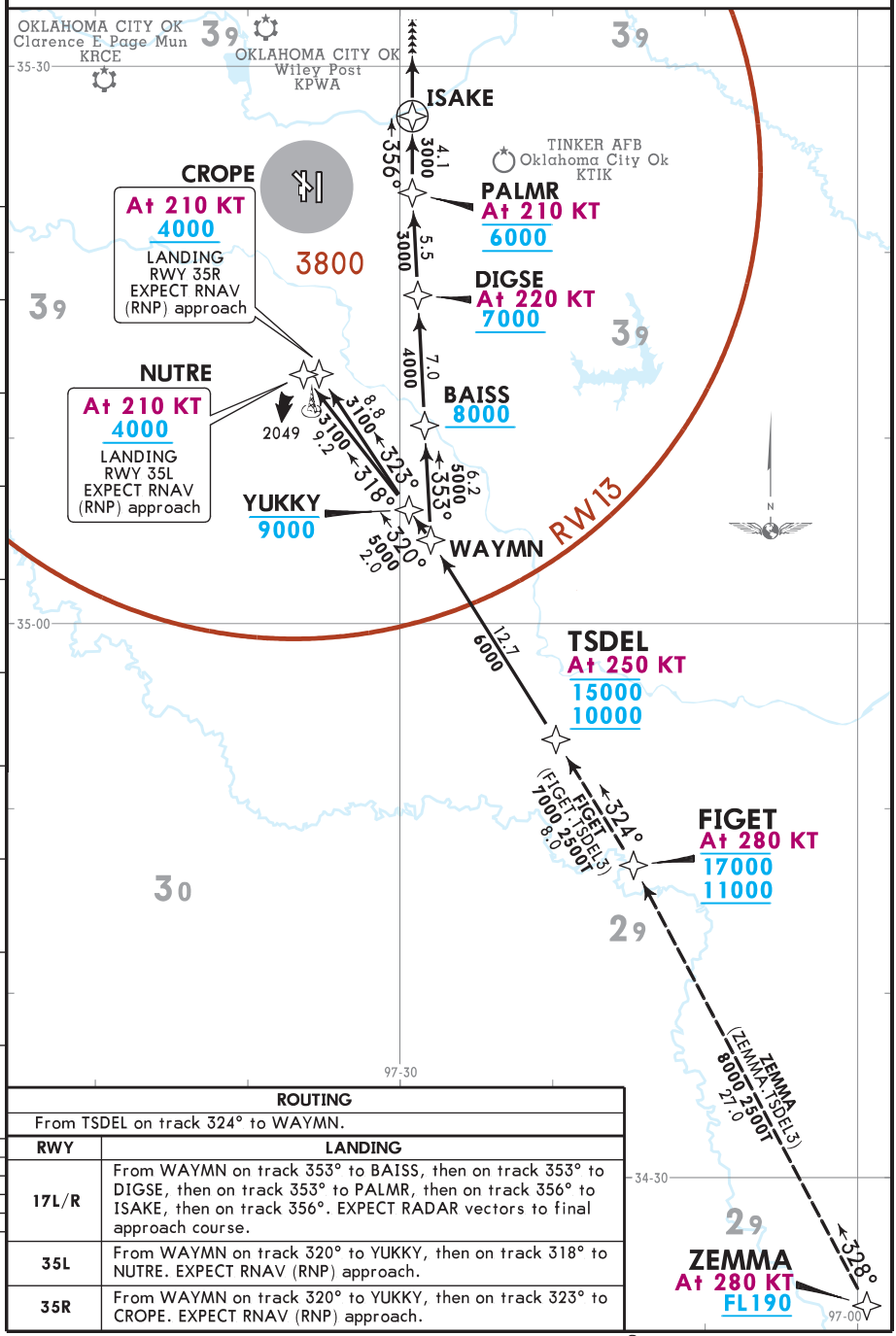
D-ATIS	Apt Elev	
125.85	1296	Alt Set: INCHES Trans level: FL180 **1. RADAR required.** **2. RNAV 1.** **3. DME/DME/IRU or GPS required.**

TSDEL 3 RNAV ARRIVAL (TSDEL.TSDEL3)



ROUTING	
From TSDEL on track 324° to WAYMN.	
RWY	**LANDING**
17L/R	From WAYMN on track 353° to BAISS, then on track 353° to DIGSE, then on track 353° to PALMR, then on track 356° to ISAKE, then on track 356°. EXPECT RADAR vectors to final approach course.
35L	From WAYMN on track 320° to YUKKY, then on track 318° to NUTRE. EXPECT RNAV (RNP) approach.
35R	From WAYMN on track 320° to YUKKY, then on track 323° to CROPE. EXPECT RNAV (RNP) approach.

1 in=10 NM

CHANGES: New format.

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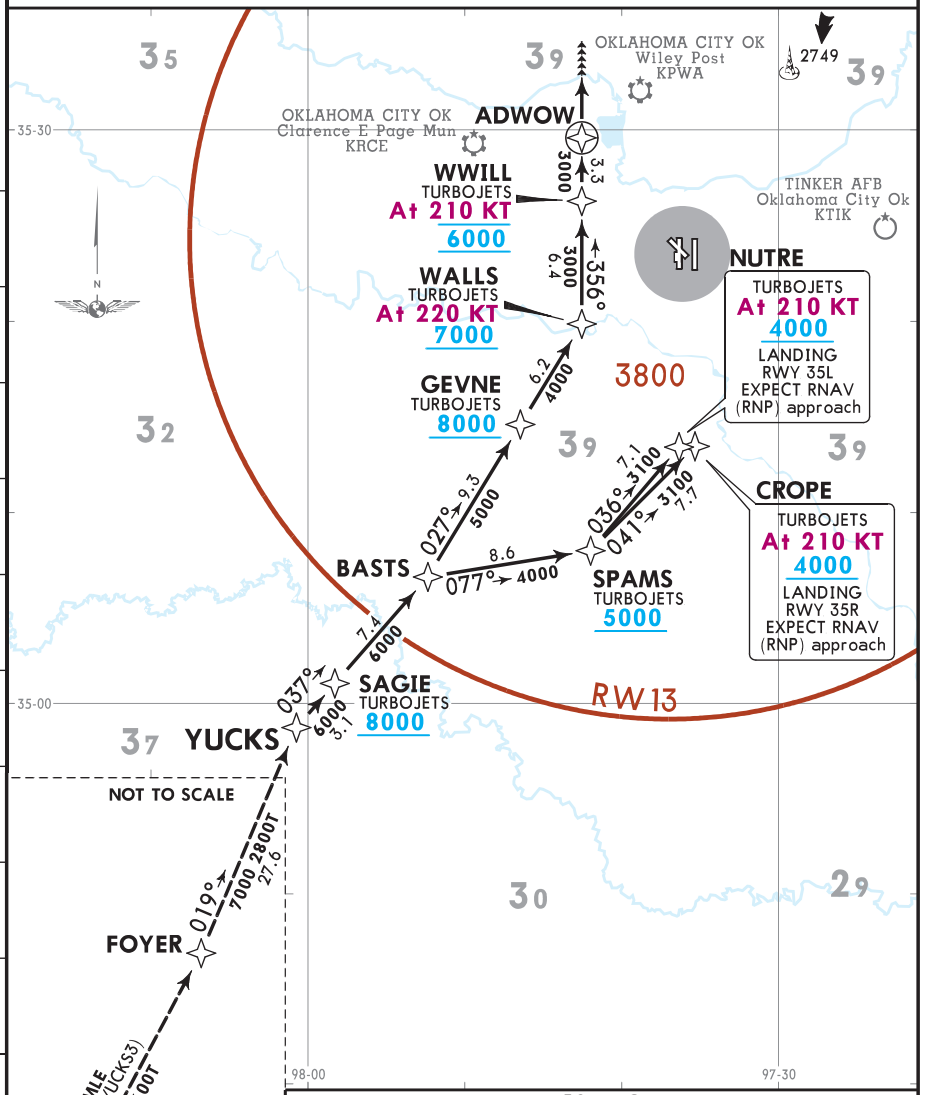
D-ATIS	Apt Elev	
125.85	1296	Alt Set: INCHES Trans level: FL180 **1. RADAR required.** **2. RNAV 1.** **3. DME/DME/IRU or GPS required.** 4. Altitude and speeds apply to turbojet aircraft only.

YUCKS 3 RNAV ARRIVAL (YUCKS.YUCKS3)



ROUTING	
From YUCKS on track 037° to SAGIE, then on track 037° to BASTS.	
RWY	**LANDING**
17L/R	From BASTS on track 027° to GEVNE. Then on track 027° to WALLS, then on track 356° to WWILL, then on track 356° to ADWOW. Then on track 356°. EXPECT RADAR vectors to final approach course.
35L	From BASTS on track 077° to SPAMS, then on track 036° to NUTRE. EXPECT RNAV (RNP) approach.
35R	From BASTS on track 077° to SPAMS, then on track 041° to CROPE. EXPECT RNAV (RNP) approach.

CHANGES: New format.

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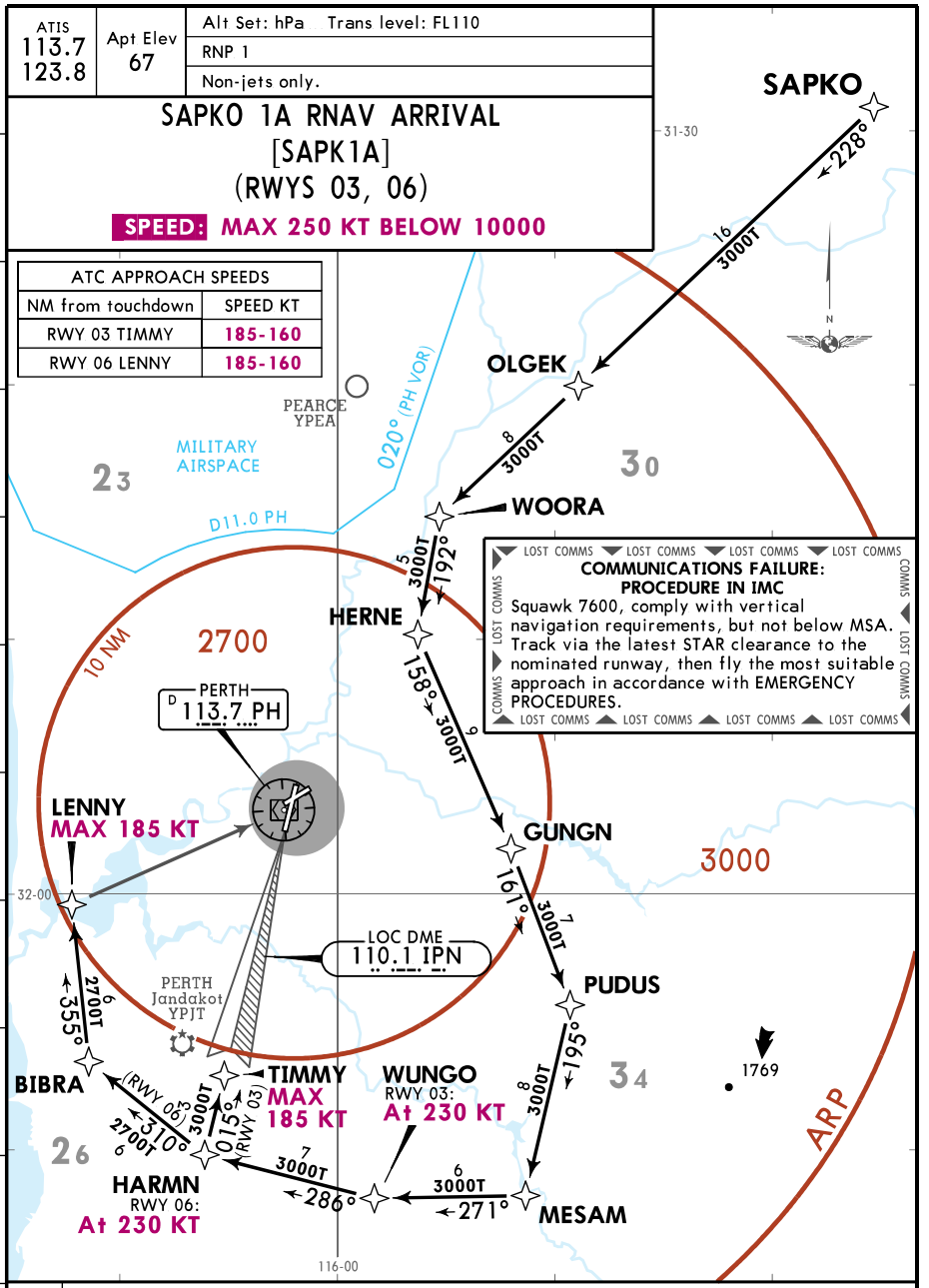
ATIS	Apt Elev	
113.7 123.8	67	Alt Set: hPa Trans level: FL110
		RNP 1
		Non-jets only.

SAPKO 1A RNAV ARRIVAL
[SAPK1A]
(RWYS 03, 06)

SPEED: MAX 250 KT BELOW 10000

ATC APPROACH SPEEDS	
NM from touchdown	SPEED KT
RWY 03 TIMMY	185-160
RWY 06 LENNY	185-160



RWY	ROUTING
03	From SAPKO, track 228° to OLGEK, track 228° to WOORA, turn LEFT, track 192° to HERNE, turn LEFT, track 158° to GUNGN, turn RIGHT, track 161° to PUDUS, turn RIGHT, track 195° to MESAM, turn RIGHT, track 271° to WUNGO, at 230 KT from WUNGO, turn RIGHT, track 286° to HARMN, turn RIGHT, track 015° to TIMMY for ILS, RNP Z or LOC RWY 03 Approach. MAX 185 KT from TIMMY.
06	From SAPKO, track 228° to OLGEK, track 228° to WOORA, turn LEFT, track 192° to HERNE, turn LEFT, track 158° to GUNGN, turn RIGHT, track 161° to PUDUS, turn RIGHT, track 195° to MESAM, turn RIGHT, track 271° to WUNGO, turn RIGHT, track 286° to HARMN, at 230 KT from HARMN, turn RIGHT, track 310° to BIBRA, turn RIGHT, track 355° to LENNY for RNP or VOR RWY 06 Approach. MAX 185 KT from LENNY.

1 in=7.5 NM

CHANGES: Procedure renamed, CONNI renamed SAPKO.

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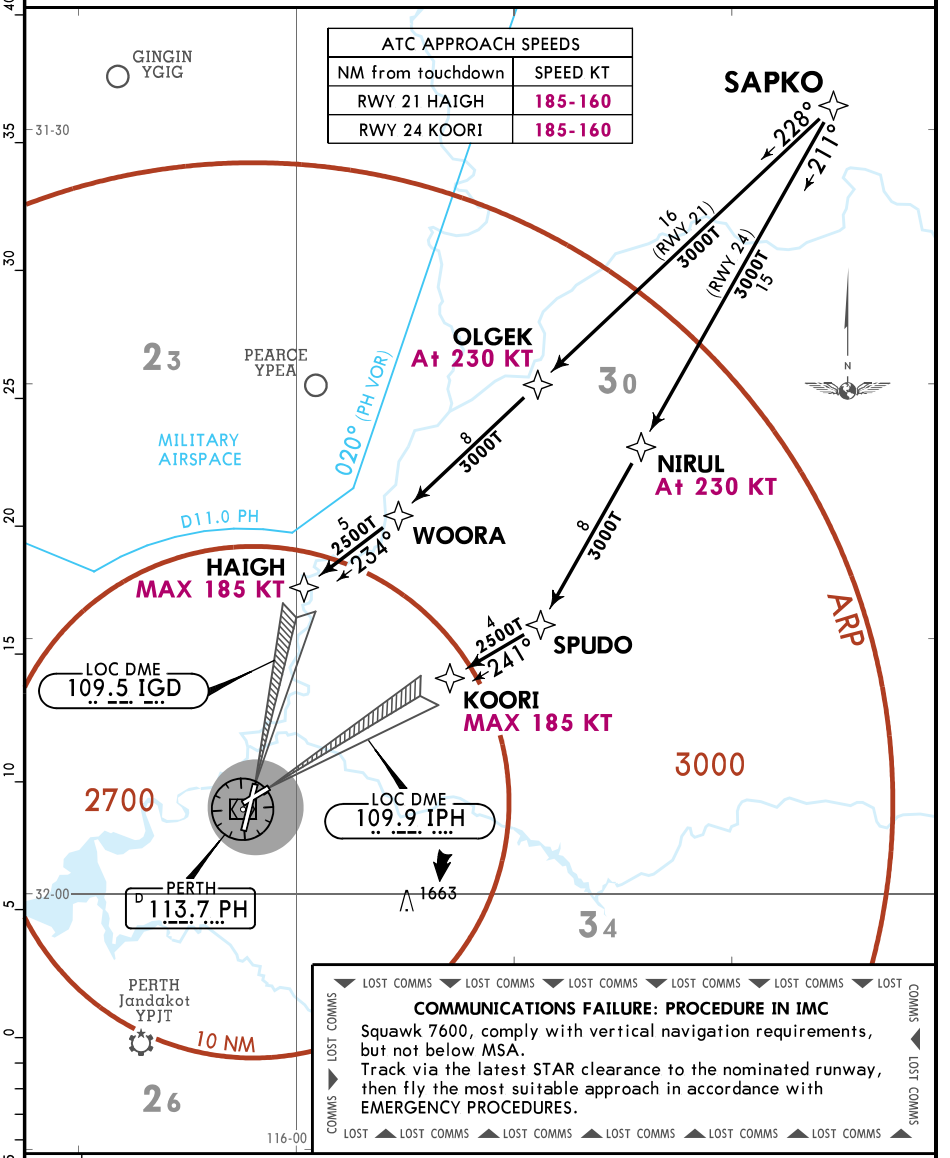
ATIS	Apt Elev	
113.7 123.8	67	Alt Set: hPa Trans level: FL110
		RNP 1
		Non-jets only.

SAPKO 1A RNAV ARRIVAL
[SAPK1A]
(RWYS 21, 24)

SPEED: MAX 250 KT BELOW 10000



ATC APPROACH SPEEDS	
NM from touchdown	SPEED KT
RWY 21 HAIGH	185-160
RWY 24 KOORI	185-160

COMMUNICATIONS FAILURE: PROCEDURE IN IMC

Squawk 7600, comply with vertical navigation requirements, but not below MSA.
Track via the latest STAR clearance to the nominated runway, then fly the most suitable approach in accordance with EMERGENCY PROCEDURES.

RWY	ROUTING
21	From SAPKO, track 228° to OLGEK, at 230 KT from OLGEK, track 228° to WOORA, turn RIGHT, track 234° to HAIGH for ILS, RNP or LOC RWY 21 Approach. MAX 185 KT from HAIGH.
24	From SAPKO, track 211° to NIRUL, at 230 KT from NIRUL, track 211° to SPUDO, turn RIGHT, track 241° to KOORI for ILS, RNP or LOC RWY 24 Approach. MAX 185 KT from KOORI.

CHANGES: Procedure renamed, CONNI renamed SAPKO.

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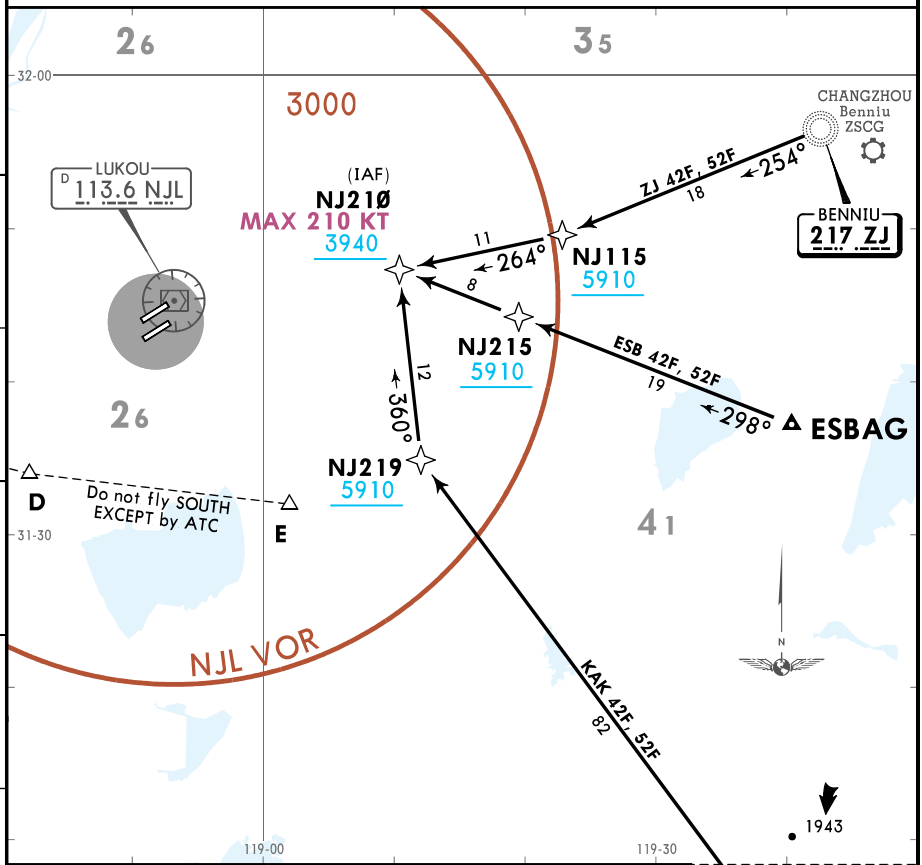
D-ATIS	Apt Elev	Alt Set: hPa Trans level: FL118
126.25	49	RNAV 1 GNSS or RNP 1 GNSS
		RADAR required for RNAV 1.

ESB 42F, ESB 52F
KAK 42F, KAK 52F
ZJ 42F, ZJ 52F
RNAV ARRIVALS
(RWYS 24, 25)



FL CONVERSION	
FL118	FL3600m

FT/METER CONVERSION	
QNH	
5910′ -	1800m
3940′ -	1200m

LOST COMMS ▼ LOST COMMS ▼ LOST COMMS
Refer to 10-1P pages.
▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS

STAR	RWY	ROUTING
ESB 42F	**24**	ESBAG - NJ215 (5910+) - NJ21Ø (K210-; 3940+).
ESB 52F	**25**	
KAK 42F	**24**	KAKIS - NJ219 (5910+) - NJ21Ø (K210-; 3940+).
KAK 52F	**25**	
ZJ 42F By ATC	**24**	ZJ - NJ115 (5910+) - NJ21Ø (K210-; 3940+).
ZJ 52F By ATC	**25**	

1 in=12.5 NM

CHANGES: Procedure type, bearings, speed.

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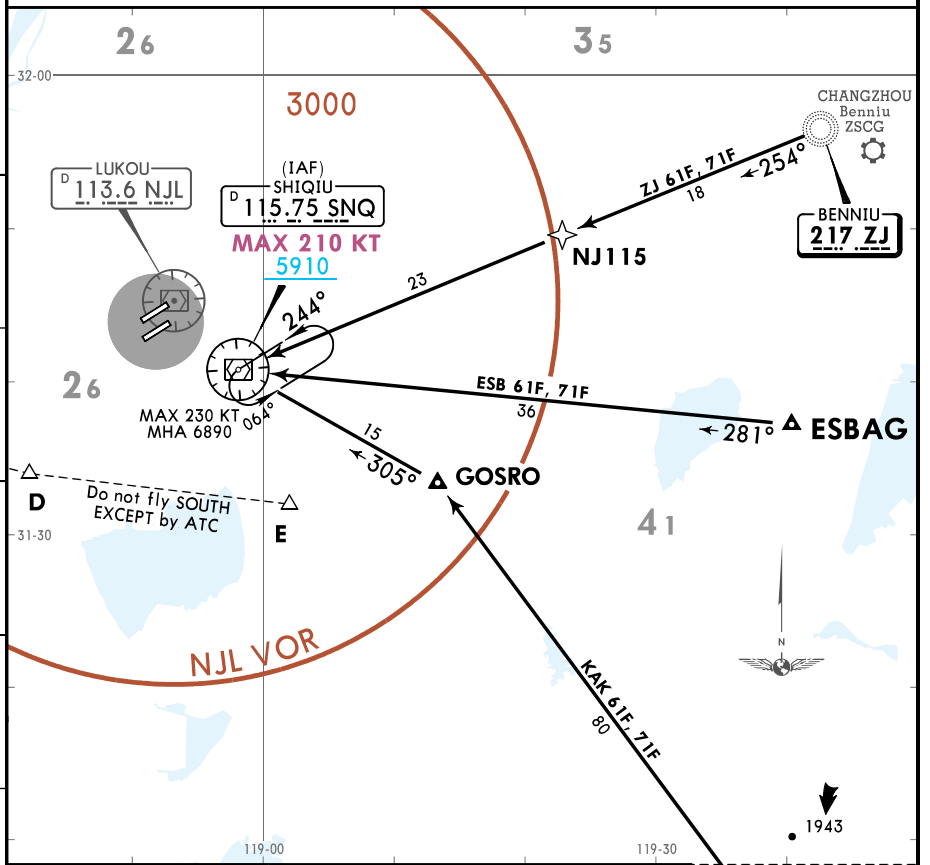
D-ATIS	Apt Elev	Alt Set: hPa Trans level: FL118
126.25	49	RNAV 1 GNSS or RNP 1 GNSS
		RADAR required for RNAV 1.

ESB 61F, ESB 71F
KAK 61F, KAK 71F
ZJ 61F, ZJ 71F
RNAV ARRIVALS
(RWYS 06, 07)



NOT TO SCALE

FL CONVERSION	
FL118	FL3600m

FT/METER CONVERSION	
QNH	
6890′ -	2100m
5910′ -	1800m

LOST COMMS ▼ LOST COMMS ▼
Refer to 10-1P pages.
▲ LOST COMMS ▲ LOST COMMS

STAR	RWY	ROUTING
ESB 61F	**06**	ESBAG - SNQ (K210-; 5910+).
ESB 71F	**07**	
KAK 61F	**06**	KAKIS - GOSRO - SNQ (K210-; 5910+).
KAK 71F	**07**	
ZJ 61F By ATC	**06**	ZJ - NJ115 - SNQ (K210-; 5910+).
ZJ 71F By ATC	**07**	

1 in=12.5 NM

CHANGES: Procedure type, bearings, speed.

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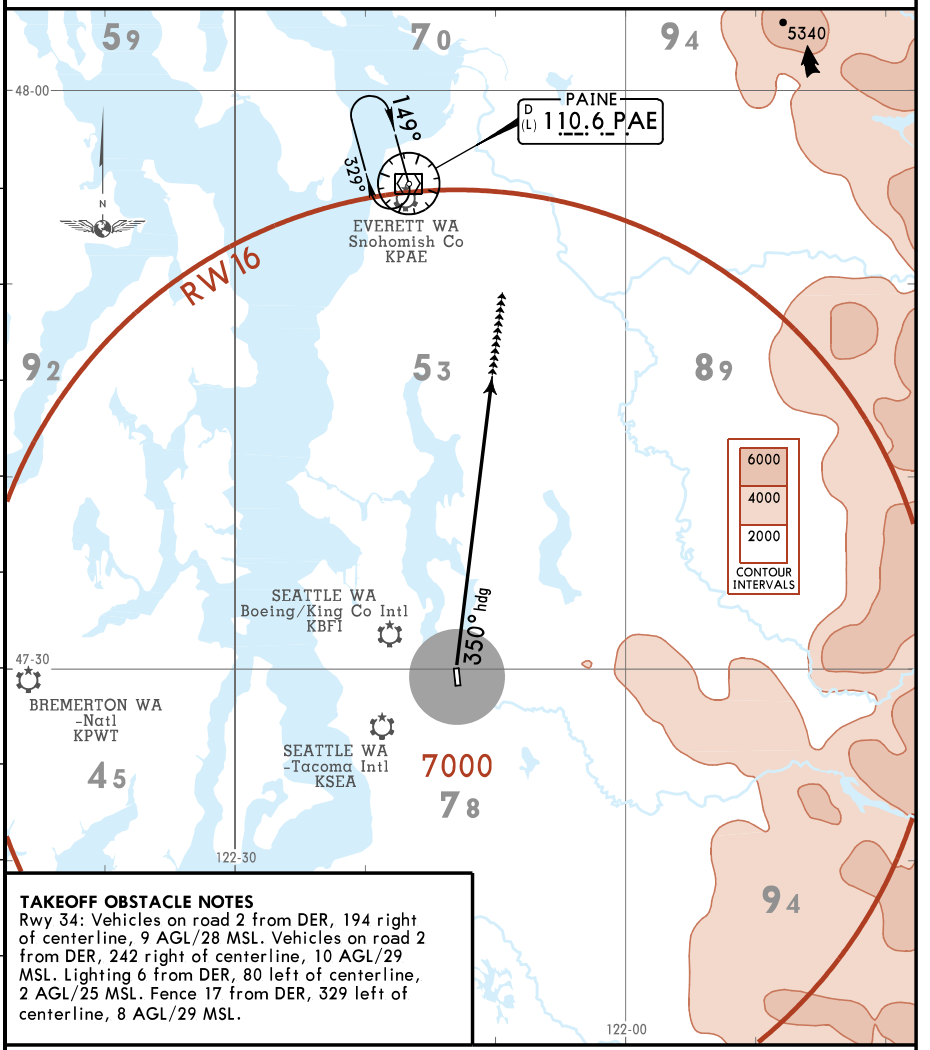
SEATTLE Departure (R) 125.9	Apt Elev 32	Trans alt: 18000 RADAR required.

BELLEVUE 4 DEPARTURE (BELVU4.BELVU) (RWY 34)



TAKEOFF OBSTACLE NOTES
Rwy 34: Vehicles on road 2 from DER, 194 right of centerline, 9 AGL/28 MSL. Vehicles on road 2 from DER, 242 right of centerline, 10 AGL/29 MSL. Lighting 6 from DER, 80 left of centerline, 2 AGL/25 MSL. Fence 17 from DER, 329 left of centerline, 8 AGL/29 MSL.

TAKEOFF MINIMUMS:
Rwy 16: Not authorized - ATC.
Rwy 34: Standard, with a minimum climb of 330 FT/NM to 2700.

Gnd speed-KT	75	100	150	200	250	300
330 FT/NM	413	550	825	1100	1375	1650

LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS ▼ LOST COMMS
If no contact with Seattle departure control within 3 minutes after departure, climbing LEFT turn direct PAE VOR. Continue climb in PAE VOR holding pattern to cross PAE VOR at or above MEA/MCA for direction of flight.
▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS ▲ LOST COMMS

INITIAL CLIMB	TOP ALTITUDE
Climb heading 350°.	3000

ROUTING
MAINTAIN 3000, for RADAR vectors, EXPECT filed altitude within 5 minutes after departure.

105

1 in=10 NM

CHANGES: Departure frequency.

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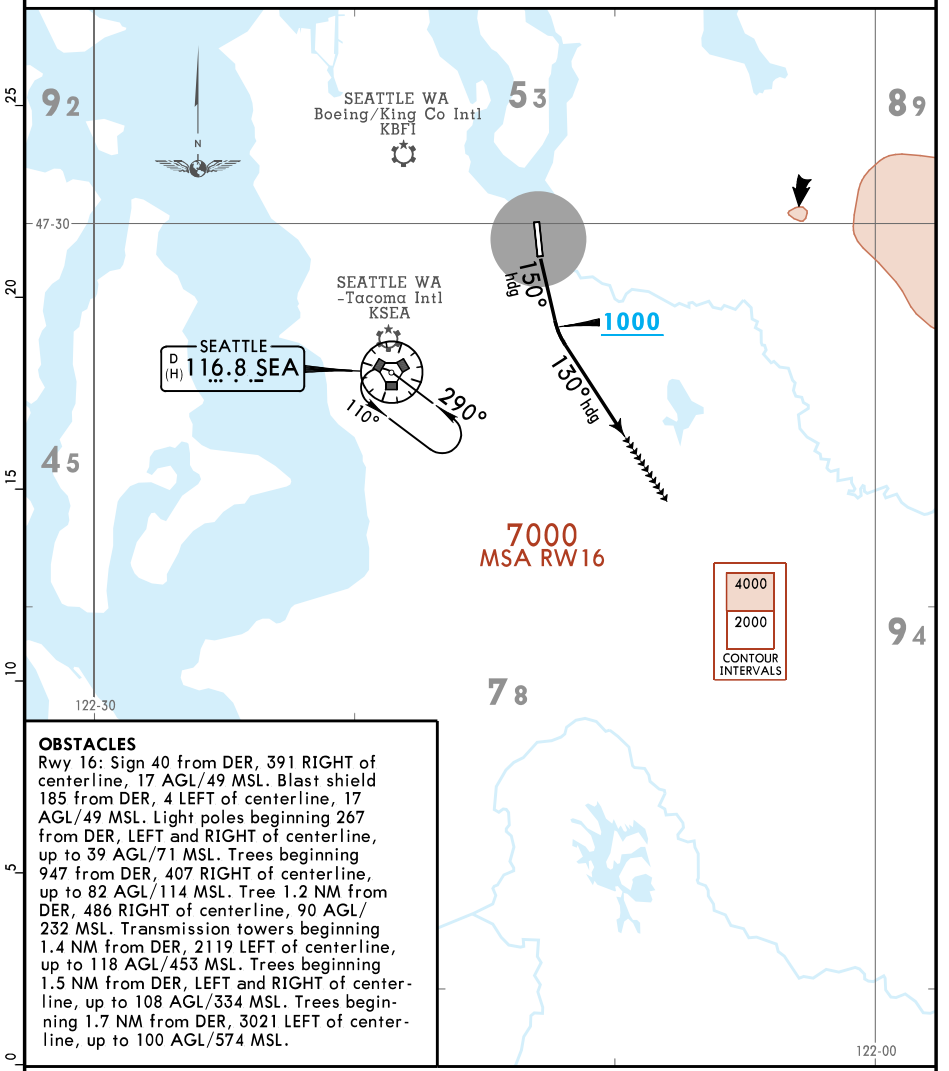
SEATTLE Departure (R) 123.9	Apt Elev 32	Trans alt: 18000 RADAR required.

RENTN 3 DEPARTURE (RENTN3.RENTN)
(RWY 16)



OBSTACLES
Rwy 16: Sign 40 from DER, 391 RIGHT of centerline, 17 AGL/49 MSL. Blast shield 185 from DER, 4 LEFT of centerline, 17 AGL/49 MSL. Light poles beginning 267 from DER, LEFT and RIGHT of centerline, up to 39 AGL/71 MSL. Trees beginning 947 from DER, 407 RIGHT of centerline, up to 82 AGL/114 MSL. Tree 1.2 NM from DER, 486 RIGHT of centerline, 90 AGL/232 MSL. Transmission towers beginning 1.4 NM from DER, 2119 LEFT of centerline, up to 118 AGL/453 MSL. Trees beginning 1.5 NM from DER, LEFT and RIGHT of centerline, up to 108 AGL/334 MSL. Trees beginning 1.7 NM from DER, 3021 LEFT of centerline, up to 100 AGL/574 MSL.

TAKEOFF MINIMUMS:
Rwy 16: Standard, with a minimum climb of 405 FT/NM to 800.
Rwy 34: Not authorized - ATC.

Gnd speed-KT	75	100	150	200	250	300
405 FT/NM	506	675	1013	1350	1688	2025

LOST COMMS
If no contact with Seattle departure control within 3 minutes after departure, climbing RIGHT turn direct SEA VOR. Continue climb in SEA VOR holding pattern to cross SEA VOR at or above MEA/MCA for direction of flight before proceeding on course.

INITIAL CLIMB	TOP ALTITUDE
Climb heading 150° to 1000, then climbing LEFT turn heading 130°.	3000

ROUTING
EXPECT RADAR vectors. MAINTAIN 3000. EXPECT filed altitude within 5 minutes after departure.

1 in=5 NM

CHANGES: Departure frequency.

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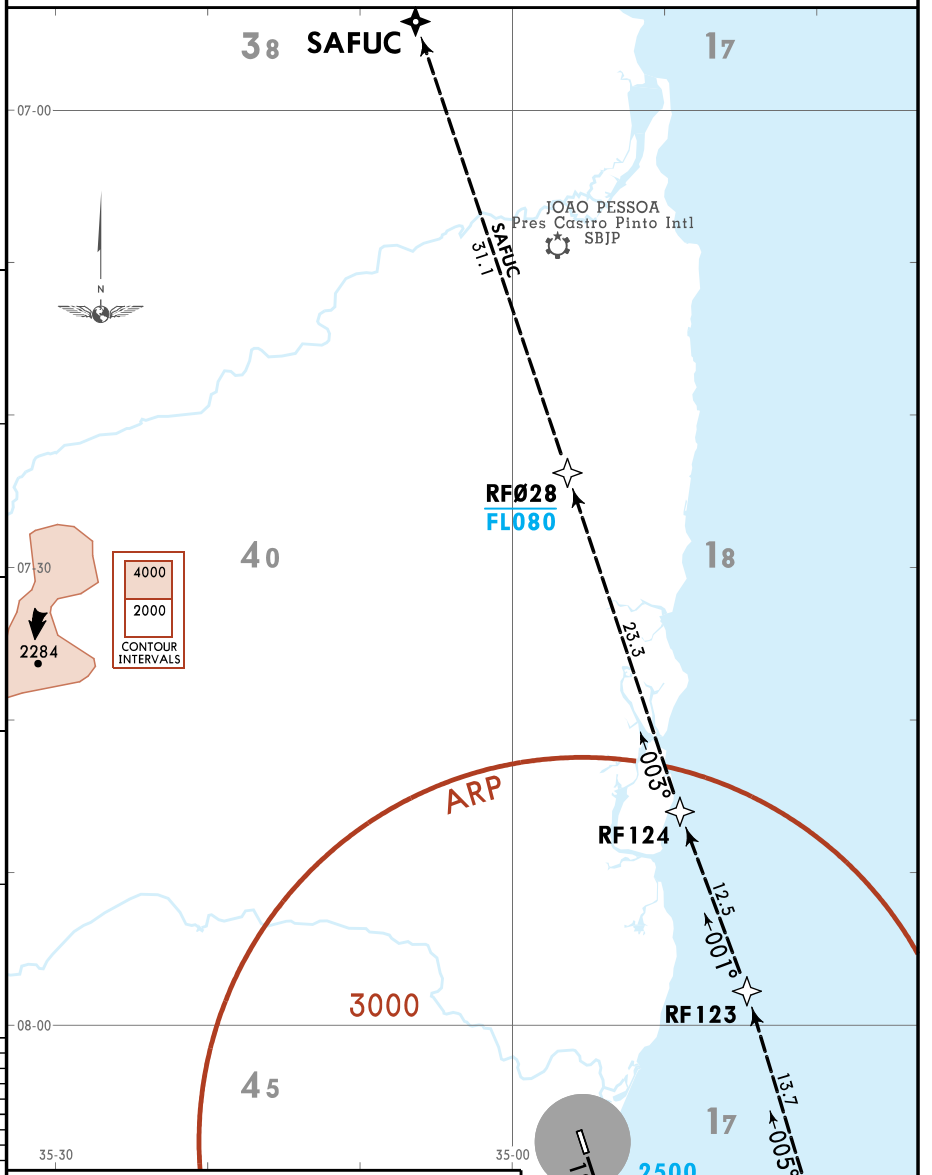
Apt Elev 33	Trans alt: 4000
	RNAV 1 or RNP 1 GNSS required

SAFUC 1A RNAV DEPARTURE [SAFU1A] (RWY 18)

CAT A, B, C & D



OBSTACLE
Close-in obstacles not considered for procedure gradient:
Tree 82, 0.1 NM from THR Rwy 36, azimuth 253°.

NOISE ABATEMENT PROCEDURE

Between 0100-0900 UTC, execute specific noise abatement procedure of equipment or MAINTAIN V2+10 KT until 900 then between V2+10 KT and V2+20 KT until 3100.

CHANGES: New procedure at this airport.

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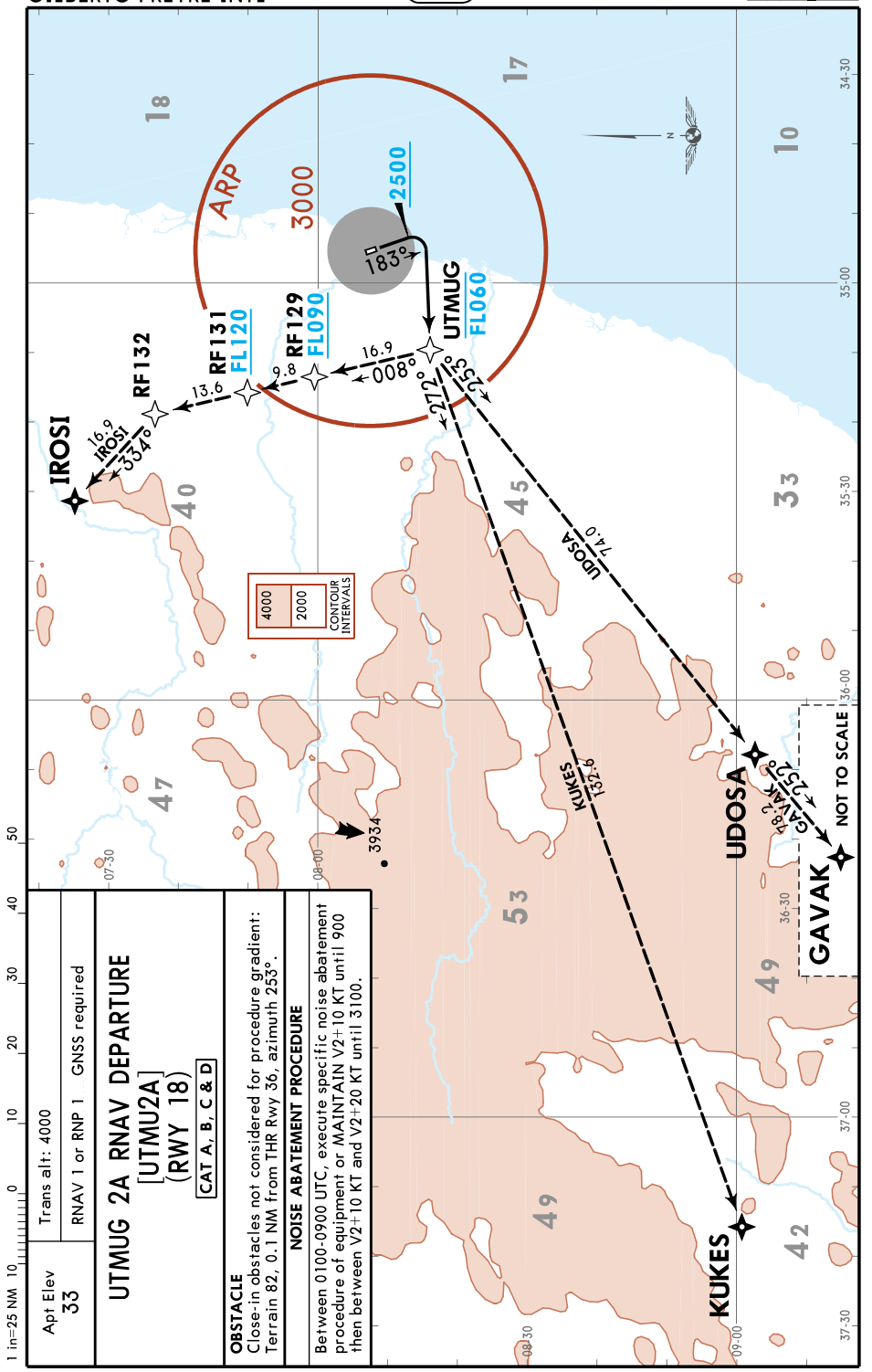

CHANGES: Procedure renumbered, altitude restriction over RF131.

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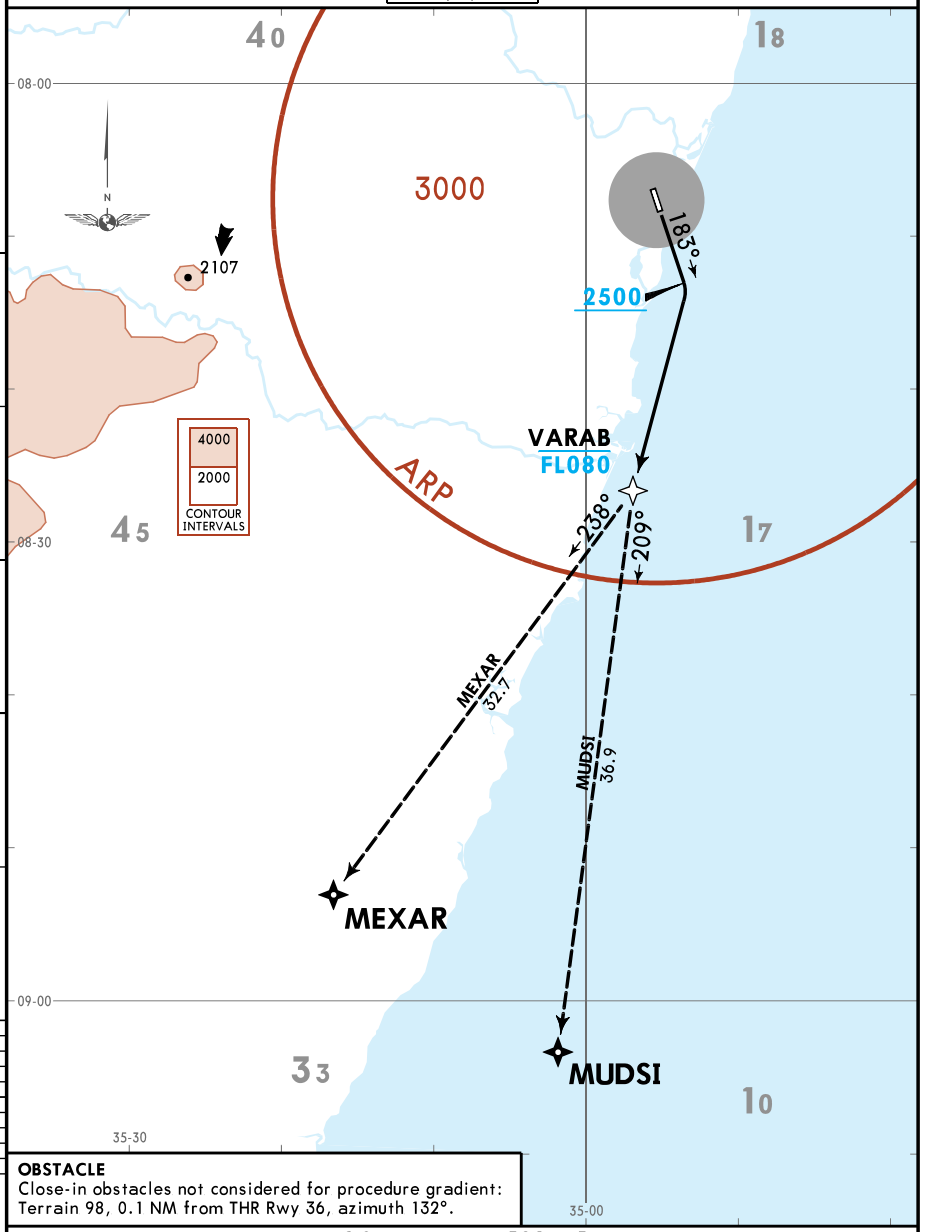
Apt Elev	Trans alt: 4000
33	RNP 1 or RNAV 1 GNSS required

VARAB 1A RNAV DEPARTURE
[VARA1A]
(RWY 18)

CAT A, B, C & D



OBSTACLE
Close-in obstacles not considered for procedure gradient:
Terrain 98, 0.1 NM from THR Rwy 36, azimuth 132°.

NOISE ABATEMENT PROCEDURE

Between 0100-0900 UTC, execute specific noise abatement procedure of equipment or MAINTAIN V2+10 KT until 900 then between V2+10 KT and V2+20 KT until 3100.

CHANGES: New procedure at this airport.

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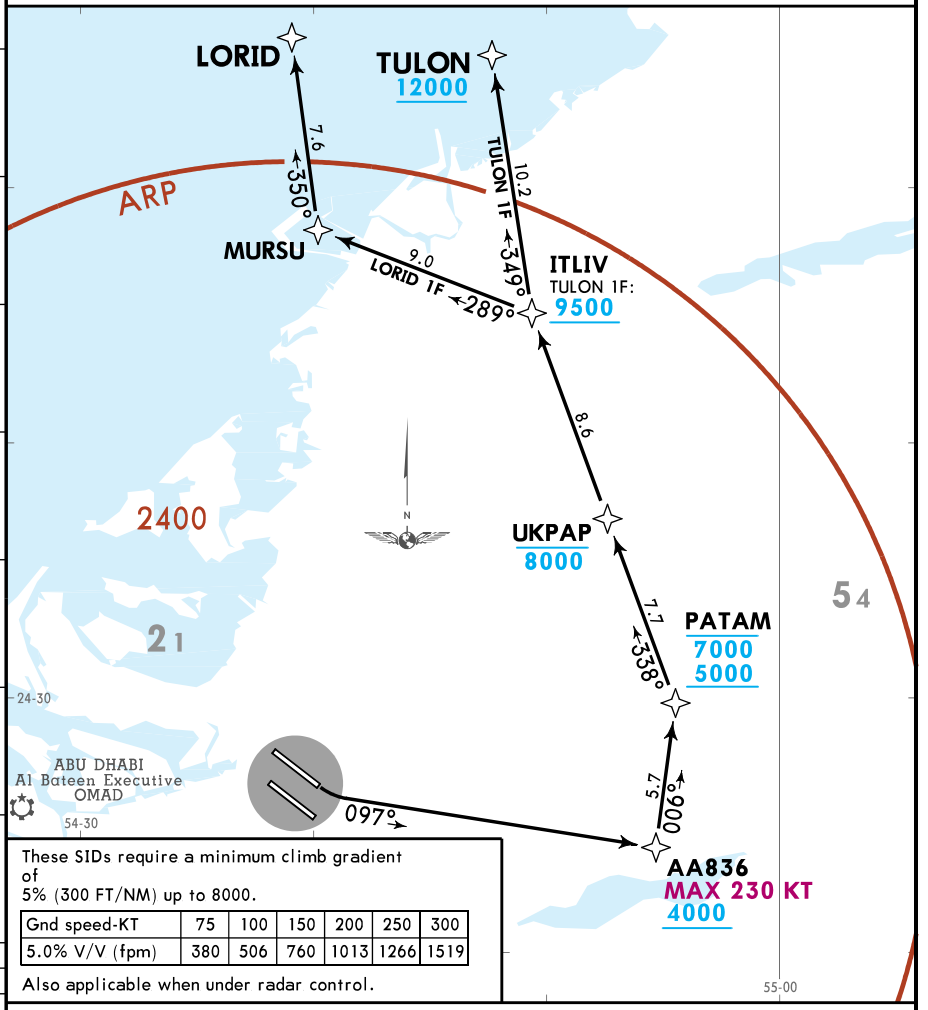
ABU DHABI Radar (C) 124.4	Trans alt: 13000
ABU DHABI Delivery 125.1	RNAV 1 GNSS required
Apt Elev 83	1. Non-compliance with RNAV 1 (GNSS) requirements shall be reported on first contact with ABU DHABI Delivery. 2. On initial call a departing ACFT shall pass the following information to ABU DHABI APP: ACFT Callsign, passing level and SID designation. 3. Advise ATC at start-up if unable to comply. 4. Contact ABU DHABI Radar as soon as possible after passing 1000, unless otherwise instructed by ABU DHABI Tower. 5. EXPECT RADAR vectoring to SID termination fix after crossing 2500. 6. Additional speed restrictions may be applicable to achieve spacing requirements and will be instructed by ATC. 7. Do not climb above ATC cleared level.

LORID 1F [LORI1F], TULON 1F [TULO1F]
RWY 13L RNAV DEPARTURES

SPEED: MAX 250 KT BELOW 10000



These SIDs require a minimum climb gradient of
5% (300 FT/NM) up to 8000.

Gnd speed-KT	75	100	150	200	250	300
5.0% V/V (fpm)	380	506	760	1013	1266	1519

Also applicable when under radar control.

Initial climb clearance **4000**,
further climb when instructed by ABU DHABI Radar

SID	ROUTING
LORID 1F	(500+) - AA836 (K230-; 4000+) - PATAM (5000+; 7000-) - UKPAP (8000-) -ITLIV - MURSU - LORID.
TULON 1F	(500+) - AA836 (K230-; 4000+) - PATAM (5000+; 7000-) - UKPAP (8000-) - ITLIV (9500+) - TULON (12000+).

1 in=7.5 NM

CHANGES: Airport name changed.

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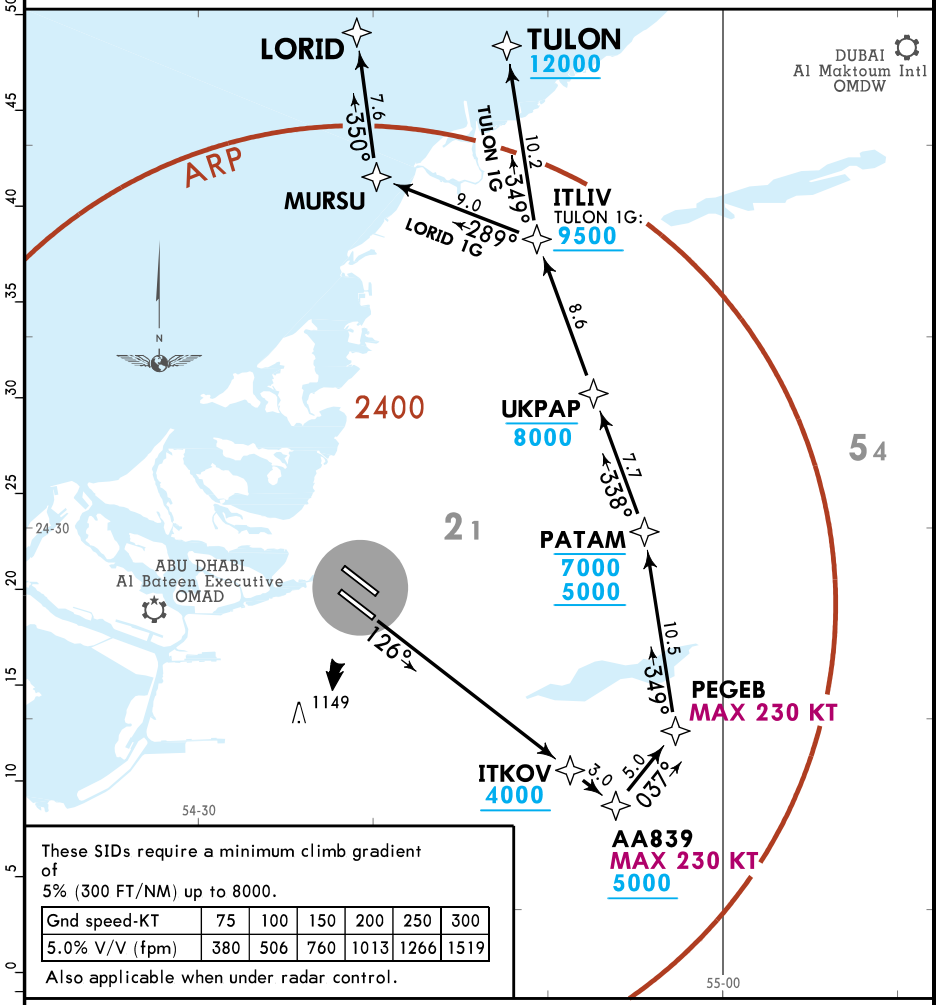
ABU DHABI Radar (C) 124.4	Trans alt: 13000
ABU DHABI Delivery 125.1	RNAV 1 GNSS required
Apt Elev 83	1. Non-compliance with RNAV 1 (GNSS) requirements shall be reported on first contact with ABU DHABI Delivery. 2. On initial call a departing ACFT shall pass the following information to ABU DHABI APP: ACFT Callsign, passing level and SID designation. 3. Advise ATC at start-up if unable to comply. 4. Contact ABU DHABI Radar as soon as possible after passing 1000, unless otherwise instructed by ABU DHABI Tower. 5. EXPECT RADAR vectoring to SID termination fix after crossing 2500. 6. Additional speed restrictions may be applicable to achieve spacing requirements and will be instructed by ATC. 7. Do not climb above ATC cleared level.

LORID 1G [LORI1G], TULON 1G [TULO1G]
RWY 13R RNAV DEPARTURES

SPEED: MAX 250 KT BELOW 10000



These SIDs require a minimum climb gradient of
5% (300 FT/NM) up to 8000.

Gnd speed-KT	75	100	150	200	250	300
5.0% V/V (fpm)	380	506	760	1013	1266	1519

Also applicable when under radar control.

Initial climb clearance **5000**,
further climb when instructed by ABU DHABI Radar

SID	ROUTING
LORID 1G	ITKOV (4000+) - AA839 (K230-; 5000+) - PEGEB (K230-) - PATAM (5000+; 7000-) - UKPAP (8000-) - ITLIV - MURSU - LORID.
TULON 1G	ITKOV (4000+) - AA839 (K230-; 5000+) - PEGEB (K230-) - PATAM (5000+; 7000-) - UKPAP (8000-) - ITLIV (9500+) - TULON (12000+).

1 in=10 NM

CHANGES: Airport name changed.

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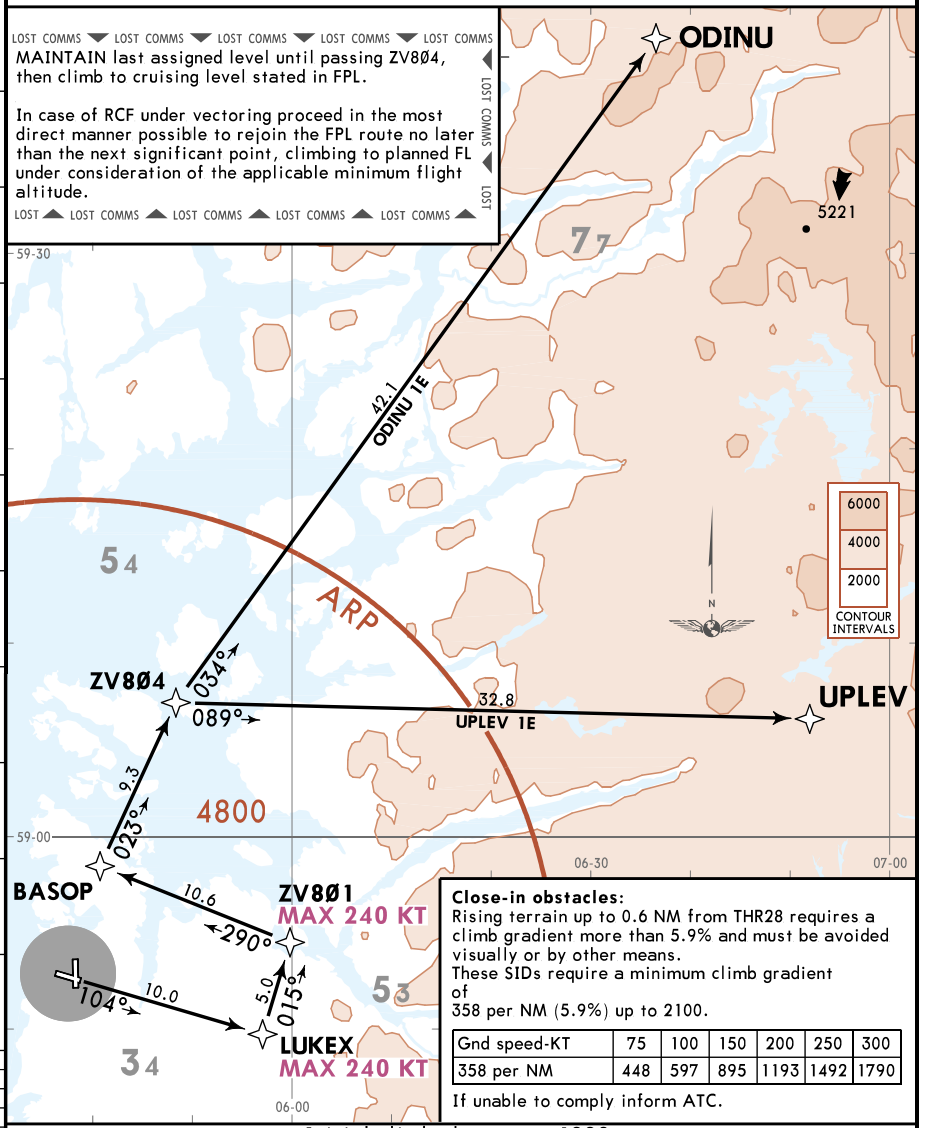
*SOLA Approach 119.6	Apt Elev 29	Trans alt: 7000
		RNAV 1. GNSS required.
		1. Contact SOLA APP when instructed by SOLA TWR. 2. Surveillance service shall be available. 3. When being vectored or cleared for direct routing the SID climb gradients apply. 4. Non RNAV 1 ACFT: at first contact with SOLA Ground state 'unable RNAV 1 due (reason)'. Omnidirectional departure available.

ODINU 1E [ODIN1E], UPLEV 1E [UPLE1E] RNAV DEPARTURES (RWY 10)



Close-in obstacles:
Rising terrain up to 0.6 NM from THR28 requires a climb gradient more than 5.9% and must be avoided visually or by other means.
These SIDs require a minimum climb gradient of
358 per NM (5.9%) up to 2100.

Gnd speed-KT	75	100	150	200	250	300
358 per NM	448	597	895	1193	1492	1790

If unable to comply inform ATC.

Initial climb clearance **6000**
EXPECT further climb from ATC.

SID	ROUTING
ODINU 1E	On 104° track to LUKEX - ZV8Ø1 - BASOP - ZV8Ø4 - ODINU.
UPLEV 1E	On 104° track to LUKEX - ZV8Ø1 - BASOP - ZV8Ø4 - UPLEV.

CHANGES: RWY renumbered; initial climb clearance; lost comms.

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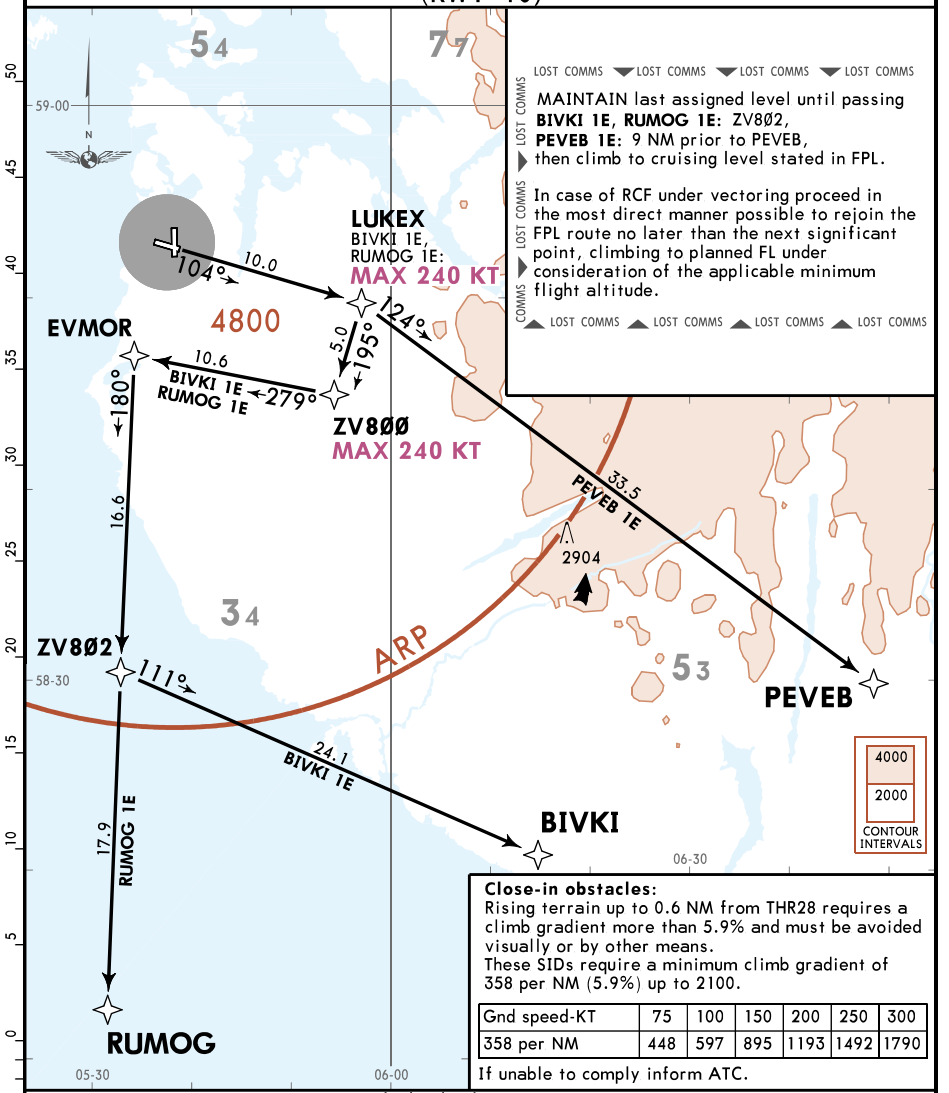
*SOLA Approach 119.6	Apt Elev 29	Trans alt: 7000
		RNAV 1. GNSS required.
		1. Contact SOLA APP when instructed by SOLA TWR. 2. Surveillance service shall be available. 3. When being vectored or cleared for direct routing the SID climb gradients apply. 4. Non RNAV 1 ACFT: at first contact with SOLA Ground state 'unable RNAV 1 due (reason)'. Omnidirectional departure available.

BIVKI 1E [BIVK1E], PEVEB 1E [PEVE1E], RUMOG 1E [RUMO1E] RNAV DEPARTURES (RWY 10)



Close-in obstacles:
Rising terrain up to 0.6 NM from THR28 requires a climb gradient more than 5.9% and must be avoided visually or by other means.
These SIDs require a minimum climb gradient of 358 per NM (5.9%) up to 2100.

Gnd speed-KT	75	100	150	200	250	300
358 per NM	448	597	895	1193	1492	1790

If unable to comply inform ATC.

Initial climb clearance **6000**
EXPECT further climb from ATC.

SID	ROUTING
BIVKI 1E	On 104° track to LUKEX - ZV8ØØ - EVMOR - ZV8Ø2 - BIVKI.
PEVEB 1E	On 104° track to LUKEX - PEVEB.
RUMOG 1E	On 104° track to LUKEX - ZV8ØØ - EVMOR - ZV8Ø2 - RUMOG.

1 in=10 NM

CHANGES: RWY renumbered; initial climb clearance; lost comms.

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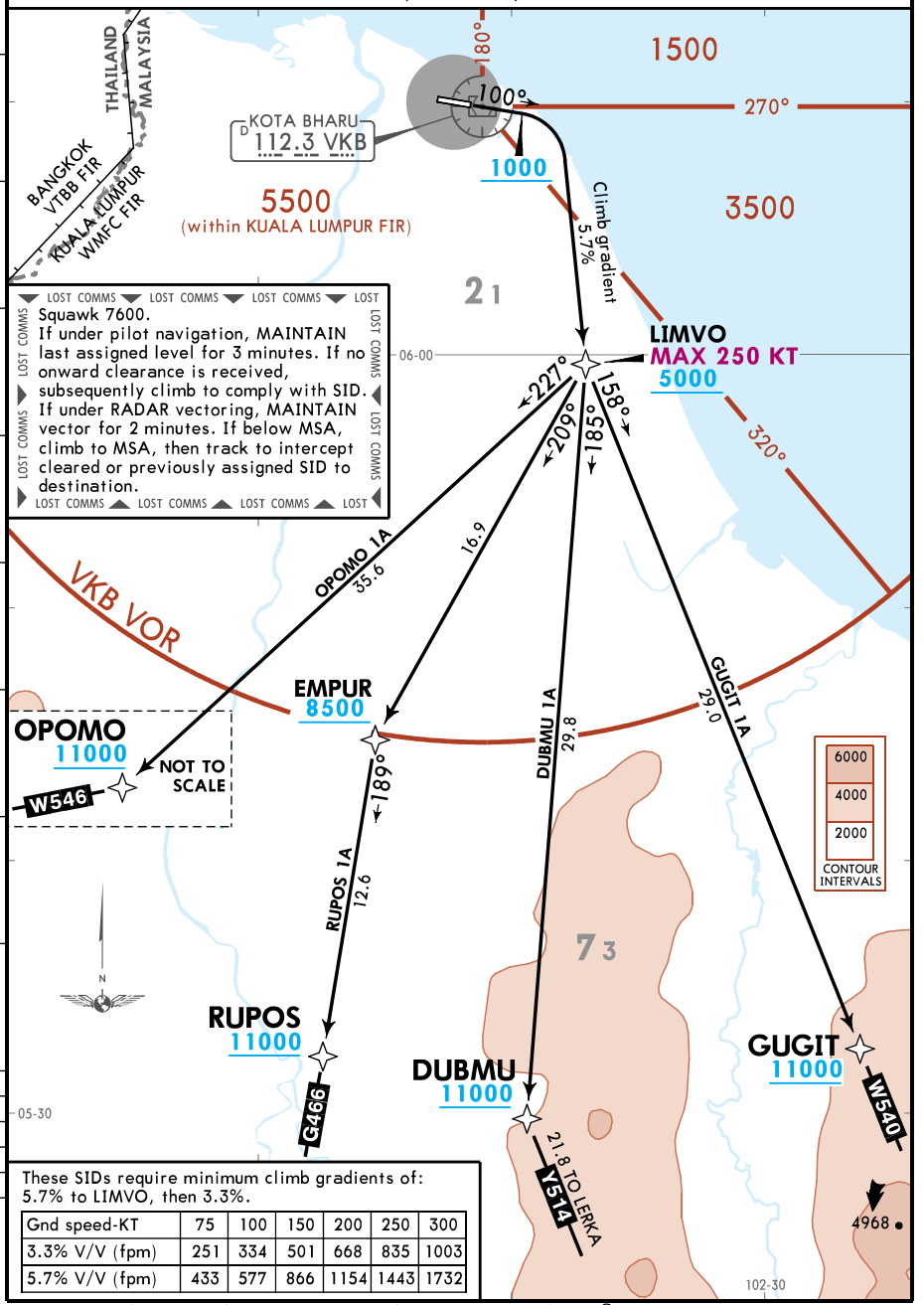
Apt Elev	Trans alt: 11000
16	RNAV 1 (GNSS).

DUBMU 1A [DUBM1A], GUGIT 1A [GUGI1A]
OPOMO 1A [OPOM1A], RUPOS 1A [RUPO1A]
RNAV (GNSS) DEPARTURES
(RWY 10)



These SIDs require minimum climb gradients of:
5.7% to LIMVO, then 3.3%.

Gnd speed-KT	75	100	150	200	250	300
3.3% V/V (fpm)	251	334	501	668	835	1003
5.7% V/V (fpm)	433	577	866	1154	1443	1732

CHANGES: Procedures renamed, DUBMU 1A established, airways established.

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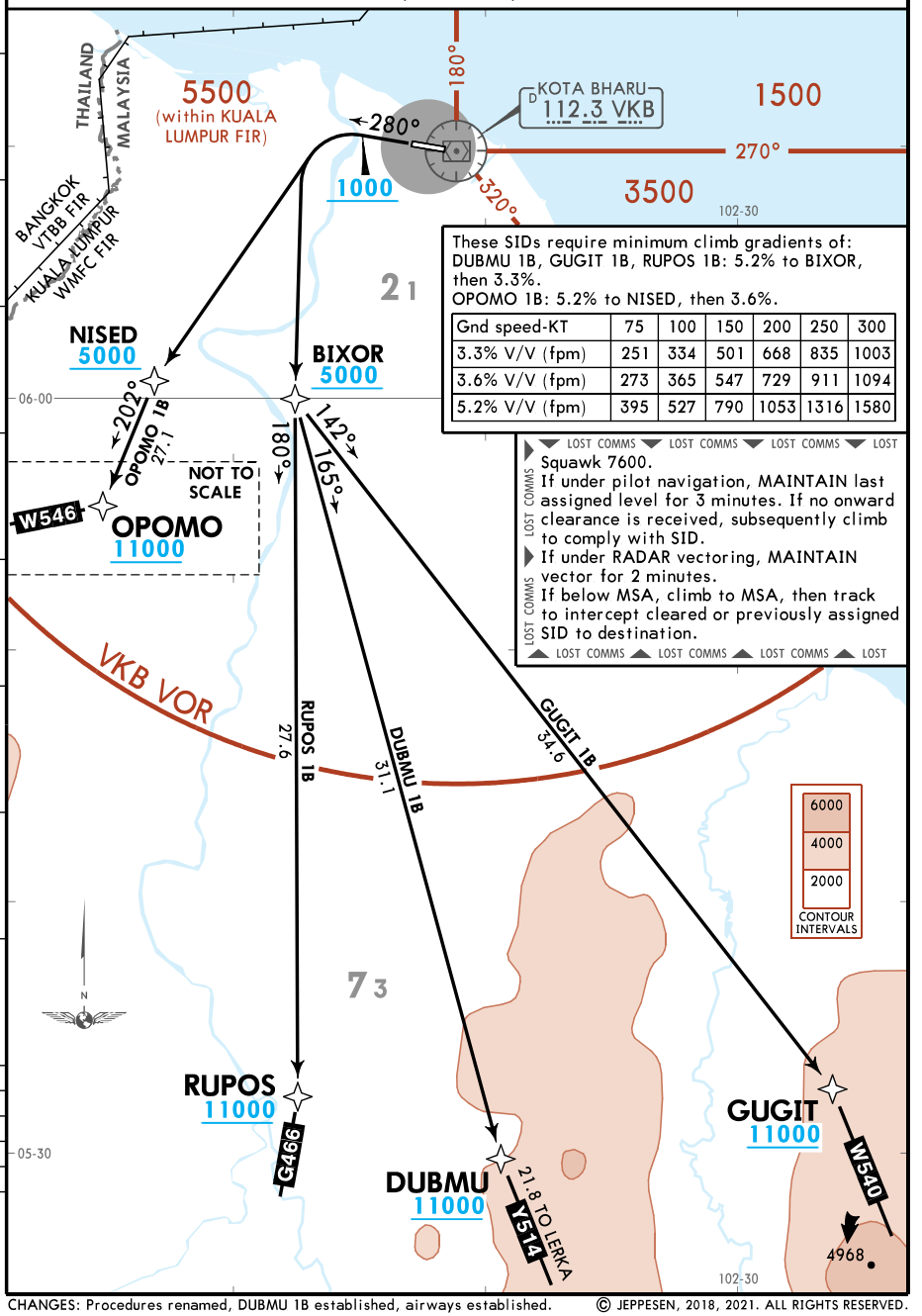
Apt Elev	Trans alt: 11000
16	RNAV 1 (GNSS).

DUBMU 1B [DUBM1B], GUGIT 1B [GUGI1B] OPOMO 1B [OPOM1B], RUPOS 1B [RUPO1B] RNAV (GNSS) DEPARTURES (RWY 28)



These SIDs require minimum climb gradients of:
DUBMU 1B, GUGIT 1B, RUPOS 1B: 5.2% to BIXOR, then 3.3%.
OPOMO 1B: 5.2% to NISED, then 3.6%.

Gnd speed-KT	75	100	150	200	250	300
3.3% V/V (fpm)	251	334	501	668	835	1003
3.6% V/V (fpm)	273	365	547	729	911	1094
5.2% V/V (fpm)	395	527	790	1053	1316	1580

LOST COMMS LOST COMMS LOST COMMS LOST

Squawk 7600.
If under pilot navigation, MAINTAIN last assigned level for 3 minutes. If no onward clearance is received, subsequently climb to comply with SID.
If under RADAR vectoring, MAINTAIN vector for 2 minutes.
If below MSA, climb to MSA, then track to intercept cleared or previously assigned SID to destination.

LOST COMMS LOST COMMS LOST COMMS LOST

CHANGES: Procedures renamed, DUBMU 1B established, airways established.

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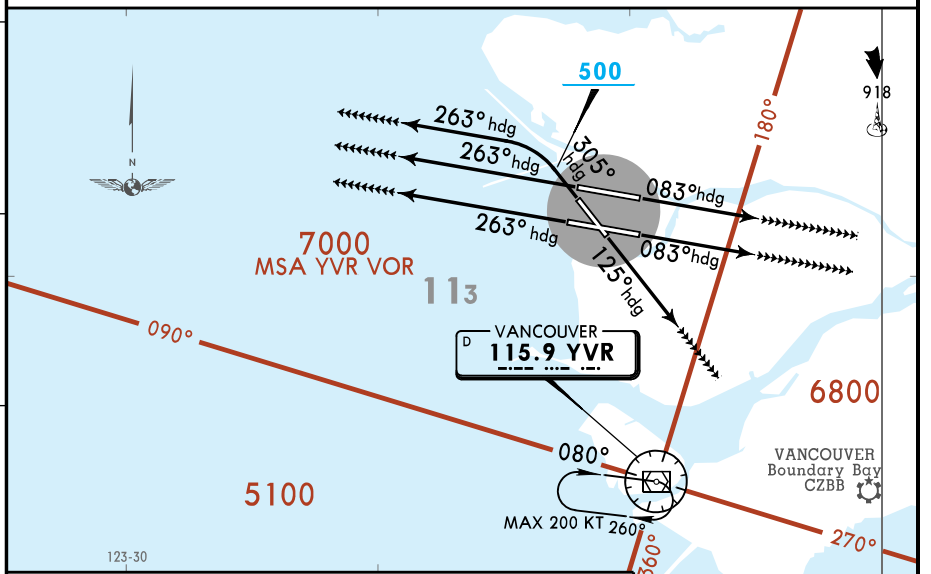
VANCOUVER Departure		Apt Elev	
NORTH	SOUTH	13	Trans alt: 18000 1. Safe altitude within 100 NM 12,800. 2. Non-Jet aircraft do not exceed 165 KT in climb until in contact with Departure Control and passing 4000. 3. Jet aircraft use Noise Abatement Departure Procedure 1 or 2. 4. Refer to 10-4 Noise Abatement Procedures for additional requirements.
126.125	132.3		

VANCOUVER 2 DEPARTURE (YVR2.)
(VECTOR)
(ALL RWYS)



This SID requires a minimum climb gradients of:
Rwy 08L: 280 FT/NM to 500.
Rwys 26L/R: 290 FT/NM to 2100.

Gnd speed-KT	75	100	150	200	250	300
280 FT/NM	350	467	700	933	1167	1400
290 FT/NM	363	483	725	967	1208	1450

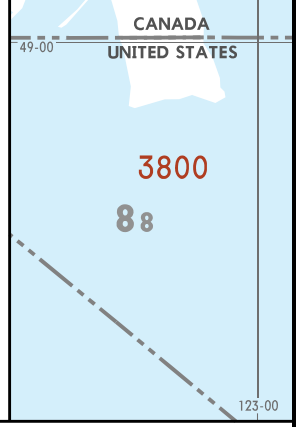
LOST COMMS LOST COMMS LOST COMMS LOST COMMS LOST COMMS LOST COMMS

On recognition of failure 5 minutes or less after take-off, below 7000 and in IFR weather conditions, proceed as follows:
Rwys 08L/R:
1. Select transponder code 7600.
2. Beyond D10.0 of YVR VOR MAINTAIN last assigned altitude, RIGHT turn direct to YVR VOR. Hold inbound R-260.
3. Proceed on course 5 minutes after selecting 7600 and climb to flight planned altitude.

Rwys 13, 26L/R, 31:
1. Select transponder code 7600.
2. Proceed on course 5 minutes after selecting 7600 and climb to flight planned altitude.

If communication failure occurs more than 5 minutes after take-off, comply with appropriate procedures for communication failure enroute.

LOST COMMS LOST COMMS LOST COMMS LOST COMMS LOST COMMS LOST COMMS



RWY	INITIAL CLIMB
08L/R	Climb heading 083° or as assigned by ATC.
13	Climb heading 125° or as assigned by ATC. NOTE: Building to 50 approximately 0.15 NM past DER, 685 LEFT of runway centerline. Tower to 50 approximately 0.2 NM past DER, 500 LEFT of runway centerline.
26L/R	Climb heading 263° or as assigned by ATC.
31	Climb heading 305° to 500. Then climbing LEFT turn heading 263° or as assigned by ATC.

ROUTING

MAINTAIN 7000 or as assigned. EXPECT RADAR vectors to filed/assigned route and clearance to flight planned altitude/flight level 5 minutes after departure.

CHANGES: Procedure renumbered, climb gradient, MSA.

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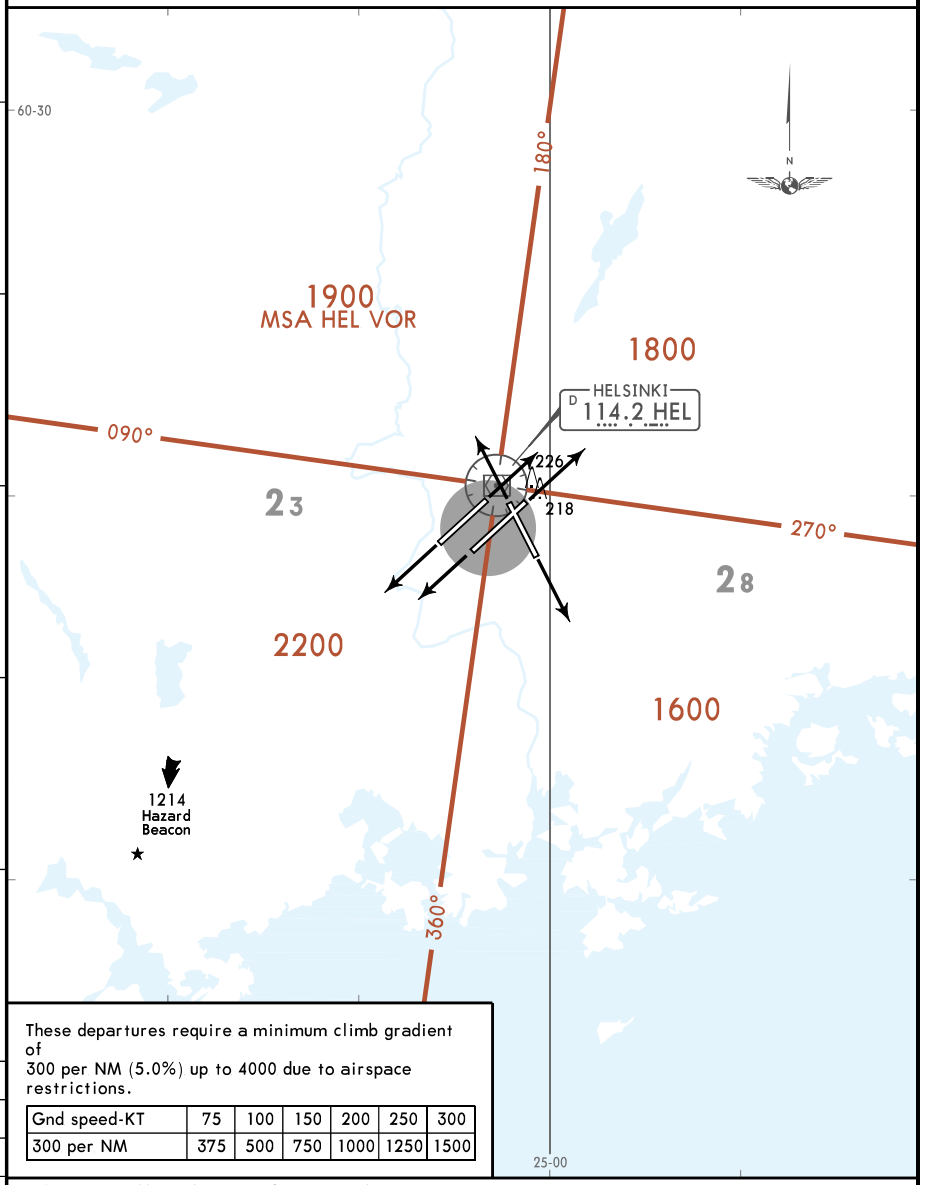
Apt Elev	
180	Trans alt: 5000 EXPECT close-in obstacles.

OMNIDIRECTIONAL DEPARTURES

SPEED: MAX 250 KT UP TO 4000 UNLESS OTHERWISE INSTRUCTED BY ATC.



These departures require a minimum climb gradient of
300 per NM (5.0%) up to 4000 due to airspace restrictions.

Gnd speed-KT	75	100	150	200	250	300
300 per NM	375	500	750	1000	1250	1500

After take-off climb as rapidly as possible to at least 2000.

Initial climb clearance **4000** or assigned altitude if lower, climb to higher level only when cleared by ATC.

RWY	ROUTING
04L/R, 15 22R, 33	Climb straight ahead to at or above 680.
22L	Climb straight ahead to at or above 730.

1 in=5 NM

CHANGES: Initial climb clearance established.

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NOISE ABATEMENT PROCEDURES

TIME RESTRICTIONS ON DEPARTURES AND ARRIVALS

A. No take-off or landing shall be permitted during the hours from 1500UTC to 2100UTC with the exception of aircraft in an emergency or in an unavoidable situation.
NOTE: "In an emergency or in an unavoidable situation" as described above shall be limited to the following cases:
(a) Aircraft encountering an abnormal situation.
(b) When abnormal situations arise among crew or passengers.
(c) Aircraft operating for the purpose of search-and-rescue activities.
(d) Aircraft operating for the purpose of urgent news collection activities.
(e) When take-off or landing is considered unavoidable due to typhoon evacuation or other reasons.
(f) When the necessity of urgent refueling arises due to unusual weather conditions.

B. The airport office JCAB shall not accept flight plans in violation of the above paragraph.

C. (1) Only RWY 16R/34L is available during the hours from 1400UTC to 1500UTC.
(2) All aircraft taking off from/landing at Narita International Airport during the hours from 1400UTC to 1500UTC shall meet the following requirement.

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The sum of noise values of the aircraft is at least 10 EPNdB (Effective perceived noise in decibels), below the total noise standard values at the flyover, approach and sideline measurement points as defined in Annex 16 to the Convention on International Civil Aviation Volume I Chapter 3 and all of the individual noise values measured at each of the measurement points are at least 2 EPNdB below the noise standard values at the corresponding points.

(3) All aircraft scheduled to take off from/land at Narita International Airport during the hours from 2100UTC to 1400UTC shall also meet the criteria mentioned on paragraph (2) above in case they take off/land from 1400UTC to 1500UTC due to delay.

(4)The provisions of the paragraph (1), (2), or (3) above shall not be applied in an emergency or in an unavoidable situation mentioned on the paragraph (A) above.

SPECIAL PROVISION FOR LANDING AND TAKE-OFF RESTRICTIONS

Special Provisions for Landing and Take-off Restrictions are implemented at Narita Intl Apt/ RJAA. These are exceptional measures to allow Landing and Take-off operation of aircraft under specific extraordinary circumstances during certain time zones of restrictions on Landing and Take-off, with the exception of aircraft in emergency or unavoidable situations.
1. Applicable Time Zones: Rwy 16R/34L - Between 1500UTC and 1530UTC.
2. Applicable Aircraft: Aircraft satisfying both conditions 1) and 2) below.
1) Aircraft falling under Narita Aircraft Noise Rating Index Categories A, B and C.
2) Landing and Take-off operation in one of the following cases, except for causes attributable to the operator:
(a) Landing of aircraft destined to RJAA delayed due to unusual weather conditions, sudden/serious medical cases or failure of essential airport functions at the port of departure.
(b) Landing of aircraft destined to RJAA delayed due to landing at another airport for unusual weather conditions or other irregular circumstances en route.
(c) Landing of aircraft destined to RJAA delayed as a result of serial delays caused by unusual weather conditions, irregular circumstances or ensuring safety of flight operation.
(d) Landing of aircraft turned back to RJAA due to unusual weather conditions or other irregular circumstances at destination airport.
(e) Take-off/landing of aircraft delayed due to unusual, irregular circumstances other than those in a) thru d) above and/or ensuring safety of operation.

(Contd on 20-4A)

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NOISE ABATEMENT PROCEDURES (contd)

NOISE ABATEMENT OPERATING PROCEDURES

It is strongly requested of all pilots to apply the following procedures, or any other appropriate procedures which are in effect equivalent to these procedures, in order to minimize public annoyance due to aircraft noise in the vicinity of the airport. The final authority to apply these procedures, however, rests on each pilot-in-command, who may use other appropriate procedures if determined to be necessary in the interest of safety.

TAKE-OFF

(a) Take-off to 1500′ AGL (1635′ MSL):
- take-off power
- take-off flaps or optimum flap setting for noise reduction
- climb at speed to gain maximum climb angle or as limited by body angle, e.g., V_2 + 10 kt or 1.3 Vs, whichever is greater

(b) At 1500′ AGL (1635′ MSL):
- reduce power to not less than climb power
- flaps and speed same as in (a) above

(c) At 3000′ AGL (3135′ MSL) or above:
- normal speed and flap retraction schedule to enroute climb

APPROACH (Delayed Flap and Reduced Flap Setting)

(a) Extend final landing flaps after passing D4.0 IKF for Rwy 16R, D4.0 ITM for Rwy 16L, D4.0 ITJ for Rwy 34R or D4.0 IYQ for Rwy 34L.

(b) Use, as the final landing flap setting, the minimum certificated landing flap setting published in the approved performance information in the Airplane Flight Manual for the applicable conditions.

OTHER INFORMATION

(A) Notwithstanding item (C) below, for improvement of noise abatement procedures, all aircraft departing from Narita Intl Airport strictly follow extension of the runway centerline until passing D14.0 NRE VOR for Rwy 16R, D14.0 NRE VOR for Rwy 16L, D6.0 NRE VOR for Rwy 34L or D5.5 NRE VOR for Rwy 34R.

(B) Aircraft Engine Ground Run-up
In order to minimize noise disturbances in areas adjacent to the airport, ground run-up of aircraft engine(s) is controlled in accordance with instructions specified in Narita Intl Airport Administrative Regulations (KUKO KANRI KITEI).

(C) Observance of Flight Routes
Unless otherwise instructed by ATC or except under unavoidable circumstances, all aircraft arriving at and/or departing from the airport, in the inland area, are requested to follow the routes as prescribed in STARs and SIDs.

PARTS DEPARTING AIRCRAFT (PDA) REPORTING TO NAA

In order to secure the safety of aircraft operations and to rectify the issue of objects falling from aircraft operating in the vicinity of Narita Intl Airport, airline operators are required to notify the NAA Ramp Control Office of any "PARTS DEPARTING AIRCRAFT" from flights operating to/from Narita Intl Airport, without delay. This information shall be shared by relevant parties in order to prevent recurrence of such.

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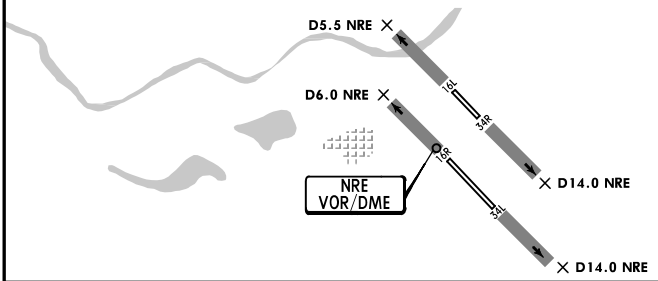
NOISE ABATEMENT PROCEDURES (contd)

TAKE-OFF PROCEDURES



FLIGHT TRACK MONITORING AT NARITA INTL AIRPORT

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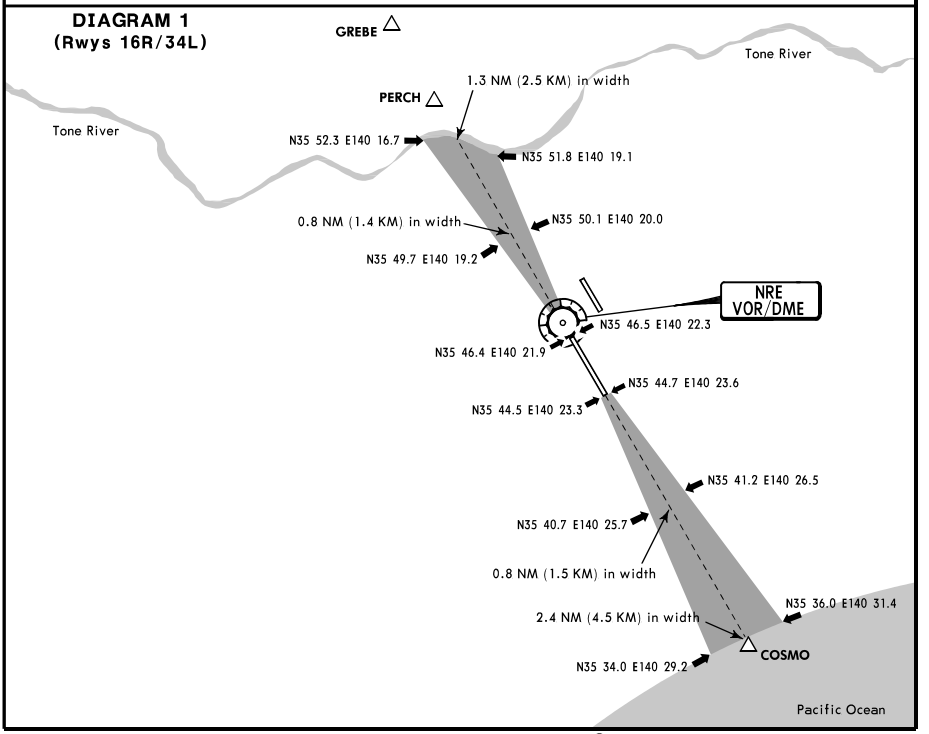
Flight track monitoring is in effect at Narita Intl Apt, as depicted in Diagram 1 below, and in Diagram 2 on Chart 20-4B. In addition, strict adherence to published SID, approach and noise abatement procedures is expected.

1. Purpose:
   To minimize the impact of noise made by aircraft operating to and from Narita Intl Airport.
2. Flight Corridors:
   Flight corridors are established as depicted in Diagram 1 below (Rwys 16R/34L) and in Diagram 2, Chart 20-4B (Rwys 16L/34R).
3. Application:
   All IFR aircraft operating to and from Narita Intl Airport.
4. Hours of Monitoring:
   H24.
5. Procedure:
   Aircraft deviating from the flight corridor may be asked the reason for the deviation. Reasons for deviations, including flight numbers, may be made public, except for those made in the interests of safety.
6. Remarks:
   For arriving aircraft, this procedure is applicable only to aircraft on an ILS approach.

DIAGRAM 1
(Rwys 16R/34L)



CHANGES: HKE VOR removed.

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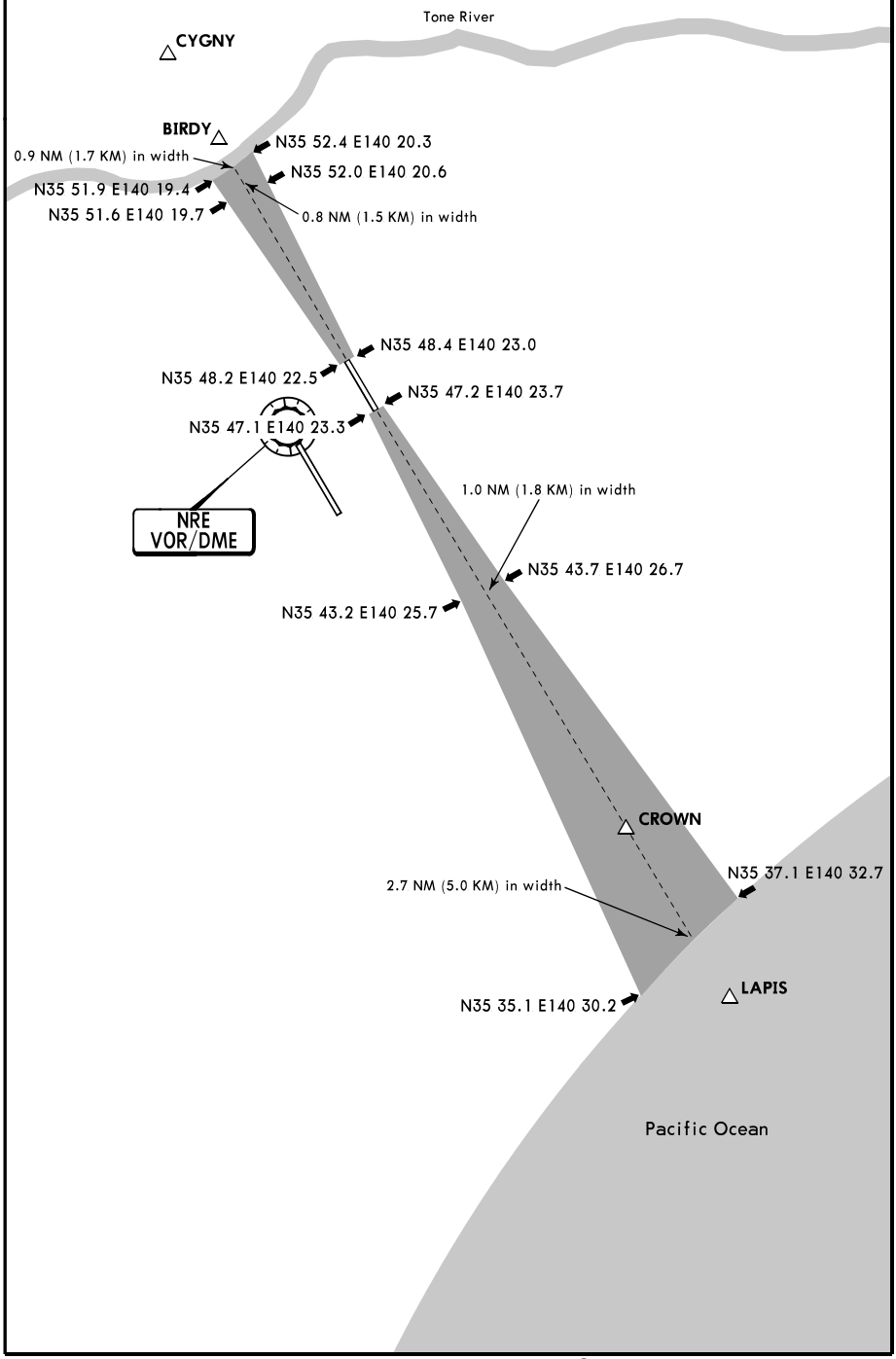
FLIGHT TRACK MONITORING (contd)

DIAGRAM 2
(Rwys 16L/34R)



CHANGES: HKE VOR removed.

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PAJN/JNU
JUNEAU INTL

JEPPESEN

2 SEP 22 (19-01)

AIRPORT QUALIFICATION

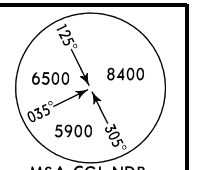
JUNEAU, ALASKA

1. Airport Qualification: Mountainous Terrain
2. Circling to Land Is Not Authorized North of the Runway
3. High Landing Minimums
4. Moderate to Severe Turbulence Near the Airport

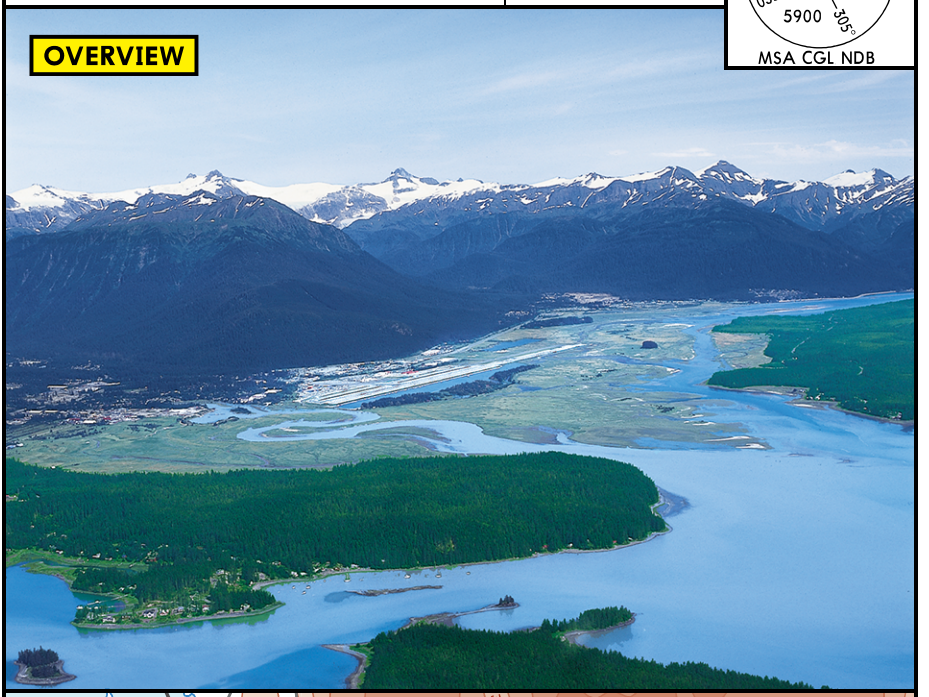
Apt Elev 25′

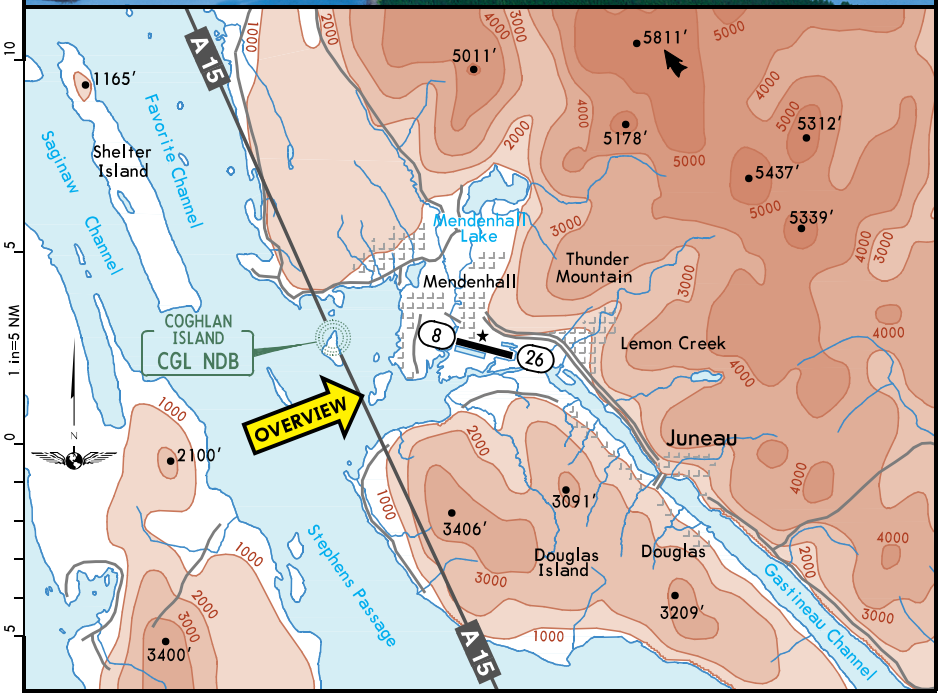
7 NM Northwest Juneau

N58 21.3 W134 34.7



MSA CGL NDB





CHANGES: Airport heading note, obstacles.

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Public	Longest Rwy (LDA): Rwy 8/26 - 8457'(2578m)	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 3406 feet MSL within 4 NM. In the northeast quadrant, terrain rises above 5000 feet MSL within 7 NM.

Caution: Expect extensive VFR traffic from May through September. Many aircraft are not transponder equipped and will note be displayed on TCAS.

Caution: Extensive helicopter activity occurs within 5 NM of the airport, and over Gastineau Channel from April 15th through October 1st.

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

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.

The airport is equipped with Juneau Airport Wind System (JAWS).

This airport utilizes sequenced flashing lead in lights.

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
❶ 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 13 cm
Other Precip			< 1 day Thunderstorms	
IMC	12%	4%	2%	6%
Prevailing Winds	ESE-13 kts	ESE-12 kts	❷ 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

❶ Annual precipitation totals 55.2 in (140 cm).
❷ Winds are from the east-southeast in June.

CHANGES: None.

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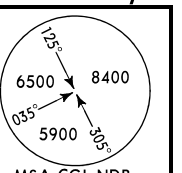
1. Airport Qualification: Mountainous Terrain
2. Circling to Land Is Not Authorized North of the Runway
3. High Landing Minimums
4. Moderate to Severe Turbulence Near the Airport

Apt Elev 25′

7 NM Northwest Juneau

N58 21.3 W134 34.7



MSA CGL NDB

RUNWAY 8

This runway uses a right-hand traffic pattern.

Visual vertical guidance is provided by VASI (3.5°) on the left side of the runway. The VASI is offset 13° right of the centerline and is not visible on runway centerline. VASI is unusable beyond 6° left of the centerline.

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

Sand on the runway used to enhance friction may not meet FAA specifications.

This runway has a usable landing length of 8457 feet (2578m).

The Obstacle Departure Procedure for this runway uses the JUNEAU Departure, and the lowest takeoff minimums require a minimum climb gradient. See JUNEAU Departure for details.

CHANGES: Airport heading note, landing length note.

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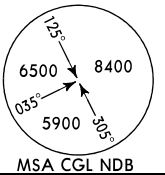
1. Airport Qualification: Mountainous Terrain
2. Circling to Land Is Not Authorized North of the Runway
3. High Landing Minimums
4. Moderate to Severe Turbulence Near the Airport

Apt Elev 25′

7 NM Northwest Juneau

N58 21.3 W134 34.7



MSA CGL NDB

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 PAPI (3.5°) on the left side of the runway. The PAPI is usable only within 2 NM.

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

Sand on the runway used to enhance friction may not meet FAA specifications.

This runway has a usable landing length of 8457 feet (2578m).

The Obstacle Departure Procedure for this runway uses the JUNEAU Departure, and the lowest takeoff minimums require a minimum climb gradient. See JUNEAU Departure for details.

CHANGES: Airport heading note, landing length note.

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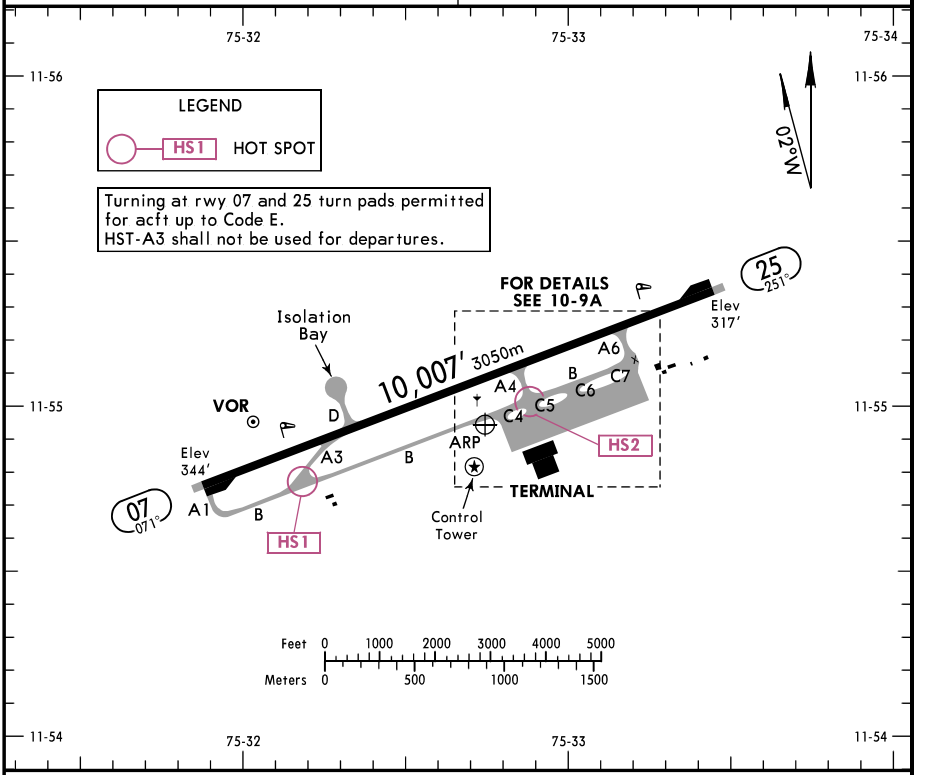
D-ATIS	KANNUR Tower
128.8	118.050



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ADDITIONAL RUNWAY INFORMATION

RWY		USABLE LENGTHS — LANDING BEYOND — Threshold	Glide Slope	TAKE-OFF	WIDTH
07	HIRL(60m) CL (30m) ❶HIALS PAPI-L (3.0°)				148′ 45m
25	HIRL(60m) CL (30m) ❶HIALS PAPI-L (3.0°) ❷RVR		8914′ 2717m		

❶ Configuration unknown ❷ HSTIL-A3

HOT SPOTS

(For information only, not to be construed as ATC instructions.)

HS1 Intersection of TWY B with TWY A3 (HST). Do not enter or cross TWY B without positive ATC clearance. Entry into TWY A3 from TWY B is prohibited (NO ENTRY Signboards provided).

HS2 Intersection of TWY A4 and TWY C5 with TWY B. Do not enter intersection of TWY B without positive ATC clearance.

Std/State TAKE-OFF

LVP must be in force

Low Visibility Take-off				RL or RCLM	RL or CL	Adequate Vis Ref	
RL & CL & relevant RVR	RL & CL	RL & RCLM	RL or CL				
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
TDZ R150m Mid R150m Rollout R150m	R200m	R300m		R/V400m		R/V500m	NA

CHANGES: Apt name. New AOM concept.

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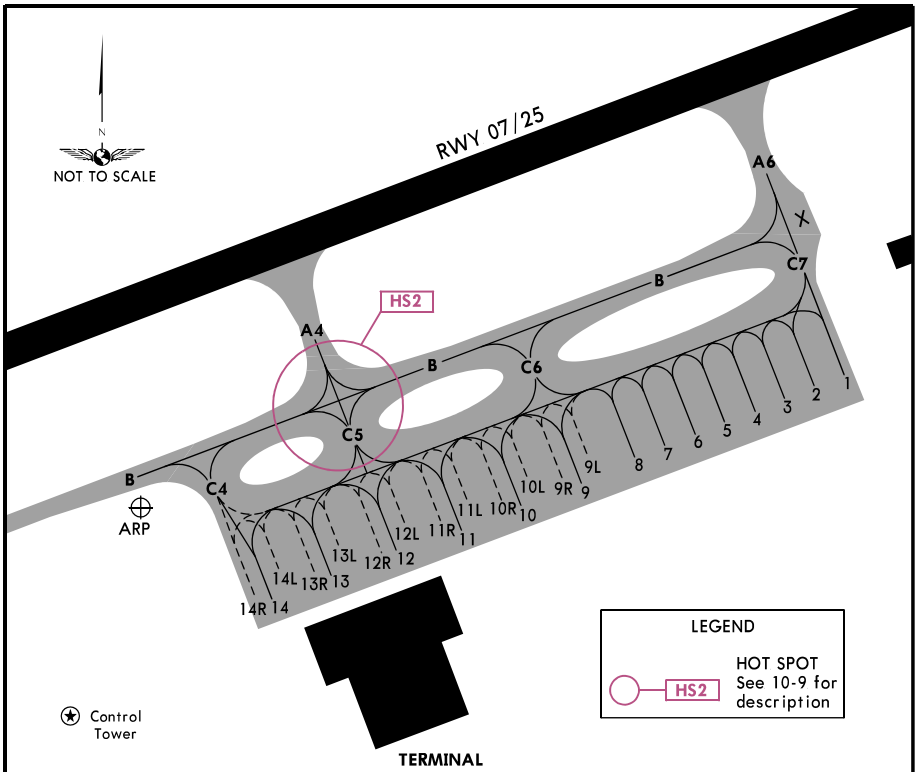

Exercise CAUTION when manoeuvring on Apron. Engine power should be restricted to the minimum required.
Advanced Visual Docking Guidance System (AVDGS) available on stands 12L thru 14R.
All stands are power-in/push-back.
All ACFT parked on stand 1, 2 and 3, shall push back facing east for startup and taxi via TWY C7 irrespective of RWY in use.
All ACFT on stand 14, 14L and 14R shall push back abeam stand 14L facing west to taxi out via TWY C4.

INS COORDINATES

STAND No.	COORDINATES	ELEV	STAND No.	COORDINATES	ELEV
1 thru 4	N11 55.0 E075 33.2	336′	10L	N11 55.0 E075 33.0	335′
5 thru 9	N11 55.0 E075 33.1	336′	10R thru 11R	N11 54.9 E075 33.0	336′
9L	N11 55.0 E075 33.1	335′	12 thru 13R	N11 54.9 E075 32.9	336′
9R	N11 55.0 E075 33.0	336′	14 thru 14R	N11 54.9 E075 32.8	336′
10	N11 54.9 E075 33.0	336′			

CHANGES: Apt name.

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NOISE ABATEMENT

SUMMER:	LT minus 2 HOURS = UTC(Z)
WINTER:	LT minus 1 HOUR = UTC(Z)

GENERAL

In order to reduce noise pollution, overflying Nantes city will be avoided as much as possible.
Permanent access restriction for Chapter 2 ACFT:
ACFT complying with the standards set out in Annex 16, Volume 1, Part 2, Chapter 2, are prohibited.
Moreover, aircraft certified in accordance with the standards mentioned in Annex 16, Volume 1, Part 2, Chapter 3 with a cumulative margin of less than 13 EPNdB, cannot :
- land between 2200-0600LT;
- leave the parking stand in order to take-off between 2200-0600LT.

Observe the engine operation instructions included in operating manuals to reduce noise nuisances during landing and takeoff.

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CURFEW PERIOD

Between 0000-0600LT no ACFT may land or leave the parking area for take-off with the exception of:
- flights scheduled between 2100-2330LT which were delayed for reasons beyond the control of the ACFT operator;
- flights scheduled between 0630-0900LT which have been brought forward for reasons beyond the control of the ACFT operator.

RUN-UP TESTS

Between 2330-0600LT engine tests for maintenance are prohibited.
Idling and high power engines tests possible in some areas defined by APT operator. Contact APT operator for scheduling and authorization.

AUXILIARY POWER UNITS (APUs)

Except in case of system failure or technical incompatibility, the use of alternative means (fixed or mobile devices supplying electricity and air conditioning while parked on apron) provided to the operator is mandatory.
The provisions relating to the use of APU during a stopover do not apply to:
- Medical or humanitarian operations;
- Emergency flights,
- Military ACFT and State ACFT exclusively assigned to a public service,
- ACFT carrying live animals, plants, perishable goods, medical or cosmetic goods requiring a strict control over the temperature and the air flow of the cabin or of the cargo compartment.

The pilot-in-command may only deviate from these rules if deemed necessary for flight safety or to protect the health of the crew, passengers and all personnel involved in the aircraft stopover. At the time of the inspection, the pilot in command or the carrier must provide the reasons for exceeding the defined periods of use of the APU.

REVERSE THRUST

A moderate use of reverse thrust is recommended as far as possible, particularly at night in accordance with operational requirements.

EXEMPTIONS

Flights that may deviate from the given restrictions are:
- Medical or humanitarian operations;
- Emergency flights;
- Flights listed in the second paragraph of Article L.6100-1 of the French Transport Code;
- Government flights.

ATC CLEARANCE

Obtaining start up clearance from ATC is not equivalent to exemption from any of the noise-abatement measures.

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NOISE ABATEMENT

ARRIVALS

Any reference to the landing time of an aircraft shall be understood as the time of touchdown on the runway.
RWY 03 is preferred up to 5 KT tailwind.

RWY 03

Between 2200-0600LT, in order to avoid the execution of the whole instrument procedure as well as the overflight of the built-up areas of Nantes, except for temporary impossibility, all IFR arrivals (excluding CDOs) will be subject to RADAR guidance with altitude limitations towards final 03.

RWY 21

Comply with the instructions described in RWY 21 instrument approach charts in order to avoid to overfly Nantes city center.
Callback mandatory at 4NM from THR, D4.3 NTS or D5.3 NT, at or above 1460.

AUXILIARY POWER UNITS (APUs)

For arriving flights, APU use is limited to:
- 10 minutes after arrival at the parking stand, when the stand is equipped with alternative devices,
- 20 minutes after arrival at the parking stand, when the stand is not equipped with alternative devices.

DEPARTURES

RWY 03

Comply with the departure procedures described in the charts SID RWY 03.
SID RWY 03 are designed to avoid as much as possible overflying urbanized areas of the towns of Nantes, Reze and Bouguenais.
Take-off from B only possible for CAT A and B ACFT.

RWY 21

Comply with the departure procedures described in the charts SID RWY 21.
SID RWY 21 are designed to avoid as much as possible overflying the towns of Bouaye, La Chevroliere and Pont Saint Martin.
ACFT departing RWY 21 do not turn before LULID (D2.3 NTS/D1.3 NT).

AUXILIARY POWER UNITS (APUs)

For departing flights, APU use is limited to:
- 10 minutes prior to the estimated off-block time, on parking stands equipped with alternative devices,
- 30 minutes prior to the estimated off-block time, on parking stands not equipped with alternative devices.

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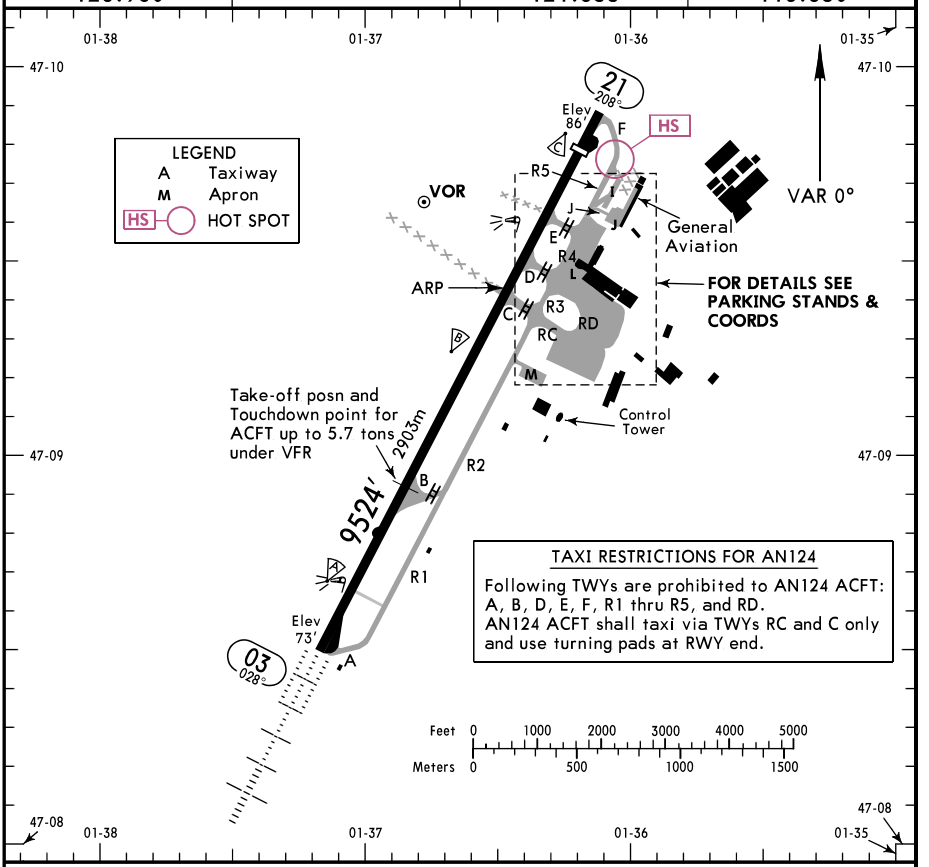
*ATIS	ACARS:	*NANTES Ground	*Tower
126.930	DCL	121.655	118.650



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TAXI RESTRICTIONS FOR AN124

Following TWYs are prohibited to AN124 ACFT: A, B, D, E, F, R1 thru R5, and RD.
AN124 ACFT shall taxi via TWYs RC and C only and use turning pads at RWY end.

ADDITIONAL RUNWAY INFORMATION

RWY		USABLE LENGTHS — LANDING BEYOND — Threshold	Glide Slope	TAKE-OFF	WIDTH
03	HIRL (60m) CL (15m) HIALS-II TDZ PAPI-L ❶ RVR	❷	8402′2561m	❸	148′ 45m
21	HIRL (60m) CL (15m) REIL PAPI-L (3.1°) RVR	8829′2691m			

❶ Angle 3.0°
❷ 9360′/2853m.
For ACFT up to 5.7 tons under VFR: 6890′/2100m.
❸ TAKE-OFF RUN AVAILABLE
RWY 03:
From rwy head 9360′ (2853m)
twy B int 6565′ (2001m) (CAT A & B ACFT only)
RWY 21:
From rwy head 9524′ (2903m)
displ thr 8829′ (2691m)
twy E int 7687′ (2343m)

HOT SPOT

(For information only, not to be construed as ATC instructions.)

HS Holding point located far upstream of RWY.

Std/State TAKE-OFF

Low Visibility Procedures required

Approval for Low Visibility Take-off required

RWY 03		All Rwys					
	RCLM & RL & CL (spacing 15m or less) & RVR	RCLM & RL & CL & RVR	RCLM & RL & RVR	RCLM & RVR & RL or CL	RCLM or RL or CL	RL or CL	Adequate Vis Ref
			DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
A B C	R125m	R150m	R300m		R/V400m		R/V500m	NA
D	R150m	R200m						

CHANGES: Windsocks.

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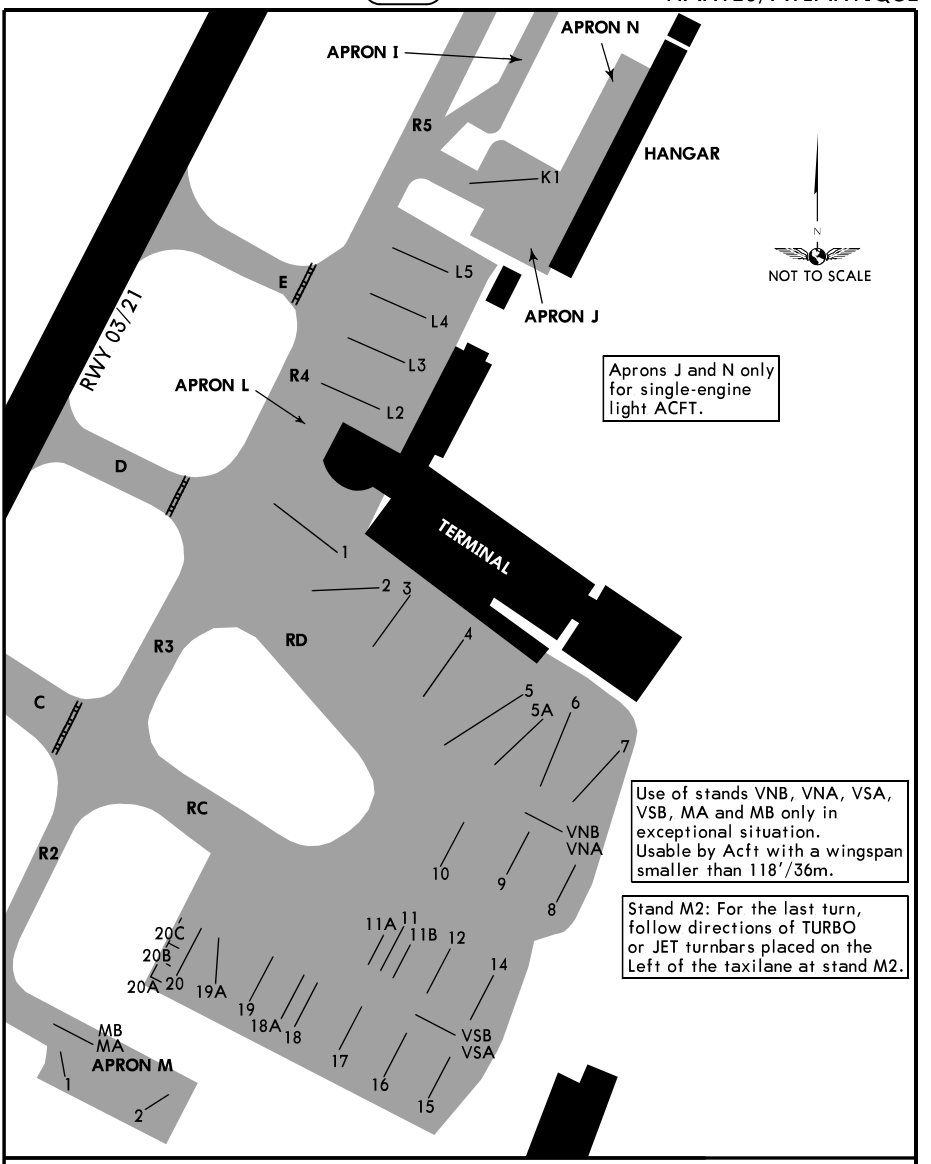

INS COORDINATES

STAND No.	COORDINATES	STAND No.	COORDINATES
1	N47 09.5 W001 36.2	VNA, VNB	N47 09.5 W001 36.2
2, 3	N47 09.4 W001 36.2	VSA, VSB	N47 09.4 W001 36.2
4 thru 6	N47 09.4 W001 36.1	**Apron J**	
7	N47 09.4 W001 36.0	K1	N47 09.6 W001 36.1
8 thru 10	N47 09.3 W001 36.1	**Apron M**	
11	N47 09.3 W001 36.2	1, MA, MB	N47 09.2 W001 36.4
12, 14	N47 09.3 W001 36.1	2	N47 09.2 W001 36.3
15	N47 09.2 W001 36.1	**Apron L**	
16 thru 18A	N47 09.2 W001 36.2	L2, L3	N47 09.5 W001 36.2
19 thru 20C	N47 09.3 W001 36.3	L4, L5	N47 09.6 W001 36.1

CHANGES: Parking stands, note.

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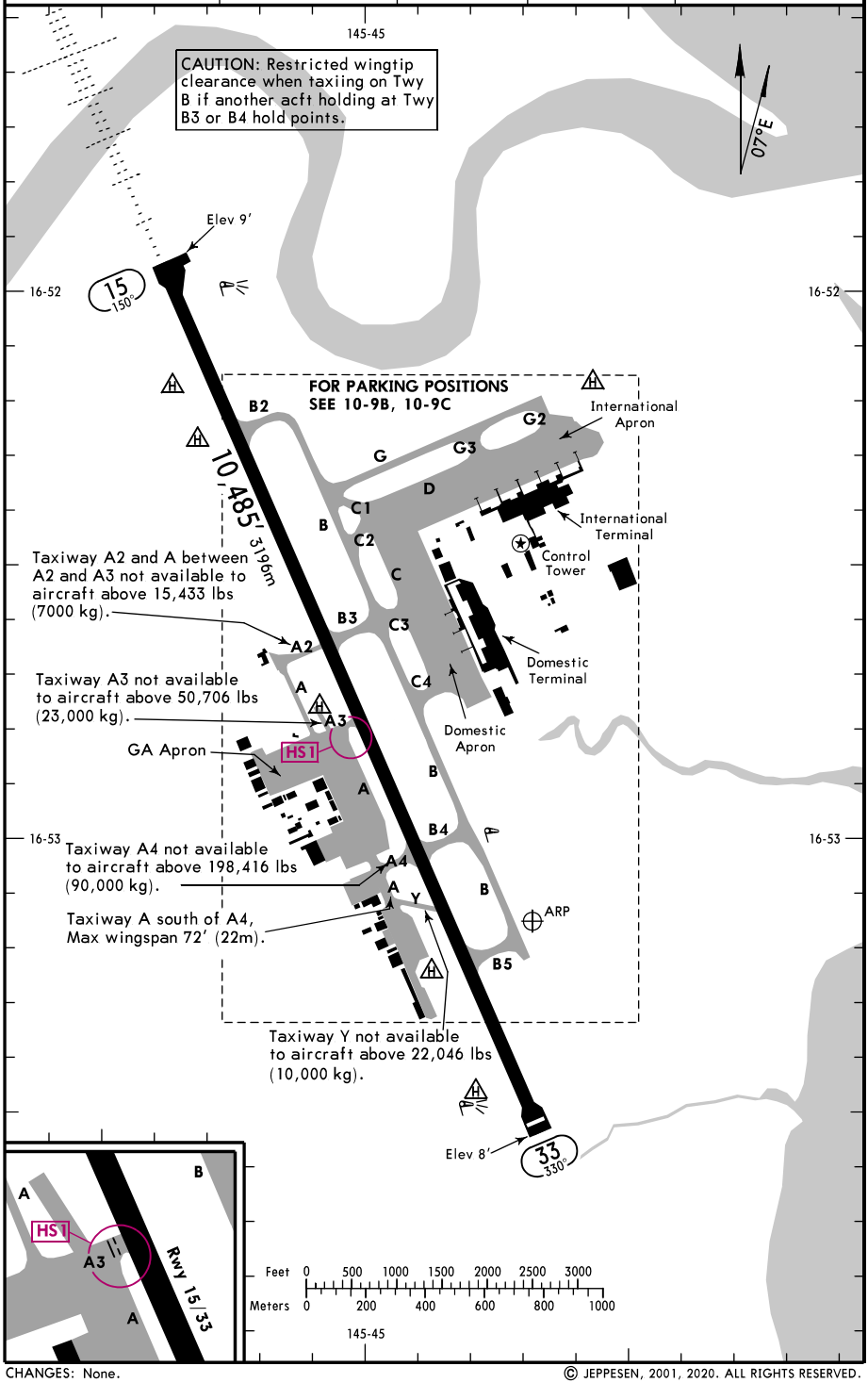
ATIS		CAIRNS Delivery	CAIRNS Ground	Tower	CAIRNS Departure (R)
113.0	131.1	128.75	121.7	124.9	118.4



CHANGES: None.

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GENERAL

CAUTION: False Traffic advisories may be generated on TCAS equipment due to transponders on naval vessels operating from HMAS Cairns (position approximately 3 NM on extended runway centerline Rwy 15/33, South East of Cairns).
Birds in vicinity of airport.
Western run-up bay not available to turbine engine aircraft except for normal pre-flight checks associated with departure.
All aircraft must provide their parked positon/gate number to ATC on acknowledgement of airways clearance.
All aircraft using Rwy15/33 turning nodes to use maximum radius turn. All wide bodied aircraft are requested to use minimum thrust.
Aircraft with wingspan above 118′ (36m) must use turning nodes at Rwy ends.
Aircraft to execute maximum radius turns. Clockwise turn only.
Outboard engines on 4-engine jet aircraft to be operated at low power on taxiways.
Right-hand circuit Rwy 33.

ADDITIONAL RUNWAY INFORMATION

RWY		USABLE LENGTHS LANDING BEYOND Threshold	Glide Slope	TAKE-OFF	WIDTH
15 ❶	HIRL MIRL HIALS PAPI (angle 3.0°, MEHT 53′) grooved	❷	9418′2871m	❸	148′ 45m
33	HIRL MIRL PAPI (angle 3.0°, MEHT 61′) grooved	10,354′3156m			

❶ Standby power available for all lighting.

❷ LDA 10,354′ 3156m

❸ TAKE-OFF RUN AVAILABLE

RWY 15:

From rwy head	10,354′3156m
Twy B2	8350′2545m
Twy B3	5810′1771m
Twy A2	5787′1764m
Twy A3	4895′1492m

RWY 33:

From rwy head	10,485′3196m
Twy B5	8478′2584m
Twy B4	7155′2181m
Twy A4	7155′2181m
Twy A3	5528′1685m

TAKE-OFF

	All Rwys
	STANDARD
1 Eng	300′-2 km
2, 3 & 4 Eng	Single pilot acft without auto-feathering. Acft not above 5700 kg & not capable of Engine out climb gradient of 1.9%. 300′-2 km
2, 3 & 4 Eng	800m

FOR FILING AS ALTERNATE

	NDB-A or VOR-A	LOC-W Rwy 33 LOC-Y Rwy 33	ILS-Y or LOC-Y Rwy 15 ILS-W or LOC-W Rwy 15	ILS-Z or LOC-Z Rwy 15 ILS-X or LOC-X Rwy 15
A	1010′- 4.4 km	1220′- 4.4 km	1280′- 4.4 km	NOT APPLICABLE
B				
C	1500′- 6.0 km	NOT APPLICABLE	NOT APPLICABLE	1280′- 6.0 km
D	1720′- 7.0 km			1720′- 7.0 km

	LOC-Z Rwy 33 LOC-X Rwy 33	RNP X Rwy 15 (AR) RNP W Rwy 15 (AR) RNP Y Rwy 33 (AR) RNP X Rwy 33 (AR) RNP W Rwy 33 (AR)	RNP Z Rwy 15 RNP Y Rwy 15 (LNAV/VNAV only)	NDB-B or VOR-B (without ILS, LOC + DME)
A	NOT APPLICABLE	1520′- 4.4 km		2110′- 4.4 km
B				
C	1290′- 6.0 km	1520′- 6.0 km		2110′- 6.0 km
D	1720′- 7.0 km	1720′- 7.0 km		2110′- 7.0 km

CHANGES: Notes, procedure titles, MIRL added for Rwy 15/33.

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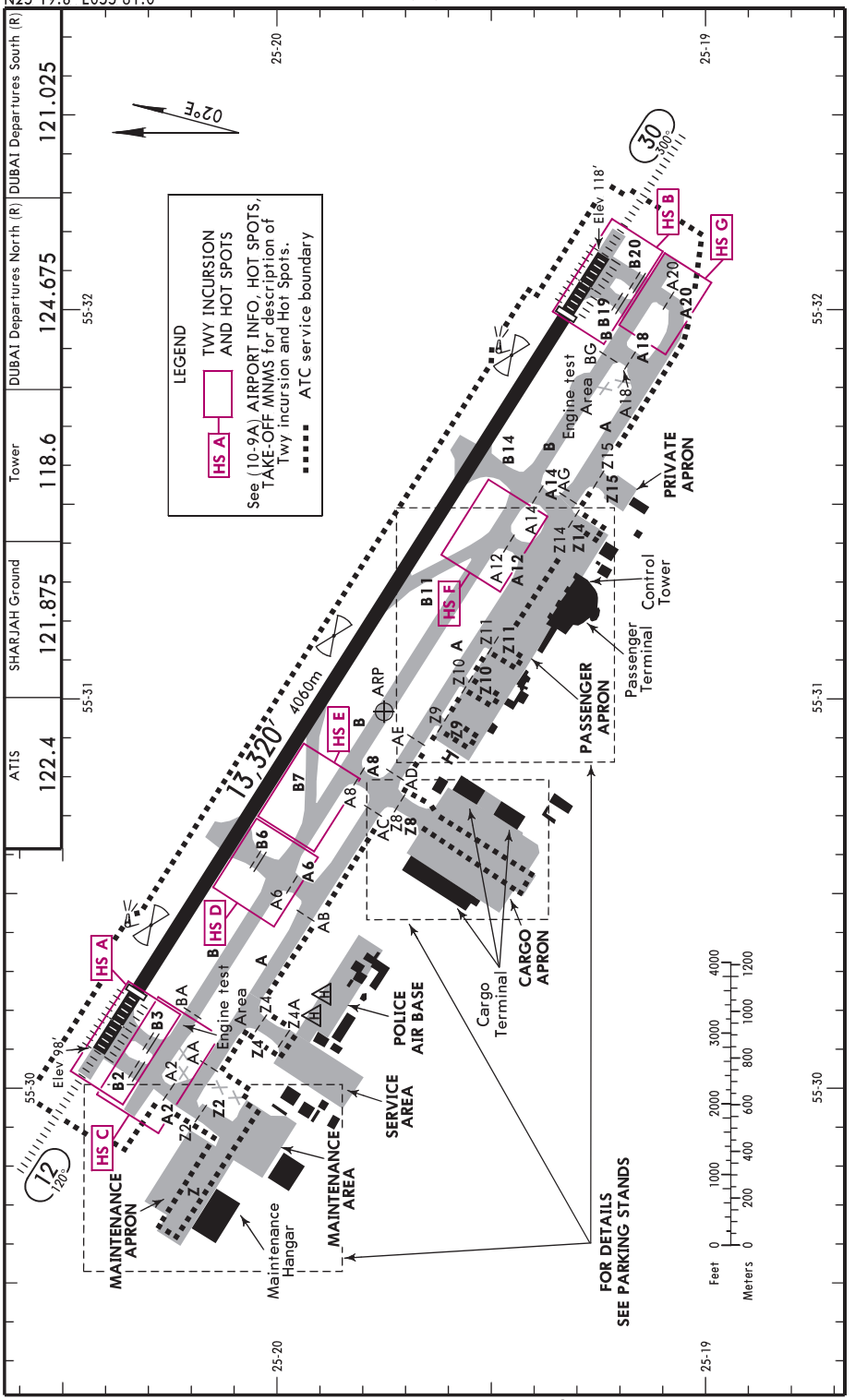
ATIS	SHARJAH Ground	Tower	DUBAI Departures North (R)	DUBAI Departures South (R)
122.4	121.875	118.6	124.675	121.025



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ADDITIONAL RUNWAY INFORMATION

RWY			USABLE LENGTHS — LANDING BEYOND — Threshold	Glide Slope	TAKE-OFF	WIDTH
12 30	HIRL(60m) CL(15m) ❶HIALS REIL TDZ PAPI(3.0°)	OFZ RVR	12,336'3760m	11,182'3408m 11,242'3427m	❷	197' 60m

❶ length 900m

❷ TAKE-OFF RUN AVAILABLE

RWY 12:
From rwy head 13,320'(4060m)
twy B6 int 9879'(3011m)

RWY 30:
From rwy head 13,320'(4060m)
twy B14 int 10,013'(3052m)

TWY INCURSION AND HOT SPOTS

(For information only, not to be construed as ATC instructions.)

HS A Two RWY exit points in close proximity: TWY B3 and TWY B2. History of TWY incursions due to operators vacating RWY 30 at TWY B3, instead of TWY B2 as instructed by ATC. When pilots request or are instructed by ATC to vacate RWY 30 at the end of the RWY, pilots are reminded:
- TWY B2 is the last vacating point for RWY 30;
- Exercise caution and use ground markings/signage for guidance.

HS B Two RWY exit points in close proximity: TWY B19 and TWY B20. History of TWY incursions due to operators vacating RWY 12 at TWY B19, instead of TWY B20 as instructed by ATC. When pilots request or are instructed by ATC to vacate RWY 12 at the end of the RWY, pilots are reminded:
- TWY B20 is the last vacating point for RWY 12;
- Exercise caution and use ground markings/signage for guidance.

HS C Do not line up on TWY B during departure.
TWY B is 197'/60m wide and can be confused for the RWY.

HS D History of TWY incursions at the intersection of TWY B6, TWY A6 and TWY B.
A trend of misroute at this intersection, pilots to exercise more caution and increase situational awareness.
When vacating RWY 30 at TWY B6, pilots are reminded:
- Unless specifically instructed by ATC, pilots are to continue taxiing left onto TWY B;
- Unless specifically instructed by ATC, do not stop at CAT I holding position on TWY B6;
- When instructed by ATC to hold short of TWY B, pilots must ensure the ACFT is clear of the RWY.

HS E After vacating RWY via TWY B7, no immediate left turn.
Continue straight ahead and vacate via TWY A6.

HS F After vacating RWY via TWY B11, no immediate right turn.
Continue straight ahead and vacate via TWY A14.

HS G Do not line up on TWY B during departure.
TWY B is 197'/60m wide and can be confused for the RWY.

Standard TAKE-OFF

	Low Visibility Take-off					
	HIRL, CL & relevant RVR	RL, CL & relevant RVR	RL & CL	Day: RL & RCLM Night: RL or CL	Day: RL or RCLM Night: RL or CL	Adequate vis ref (Day only)
A B C D	350m				400m	500m

CHANGES: None.

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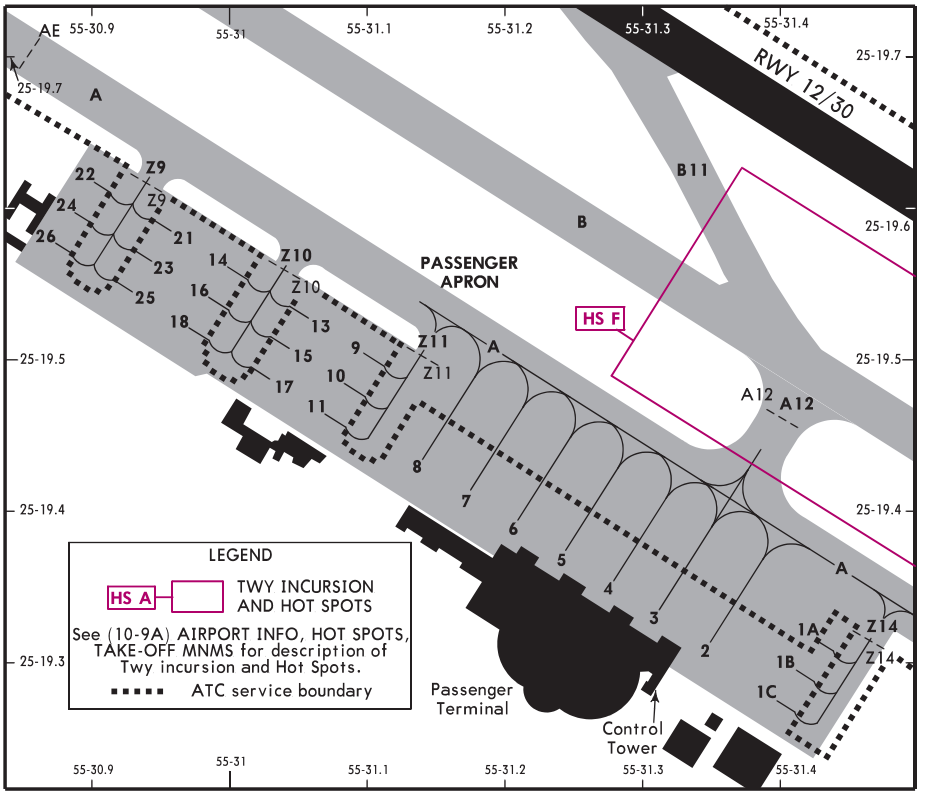

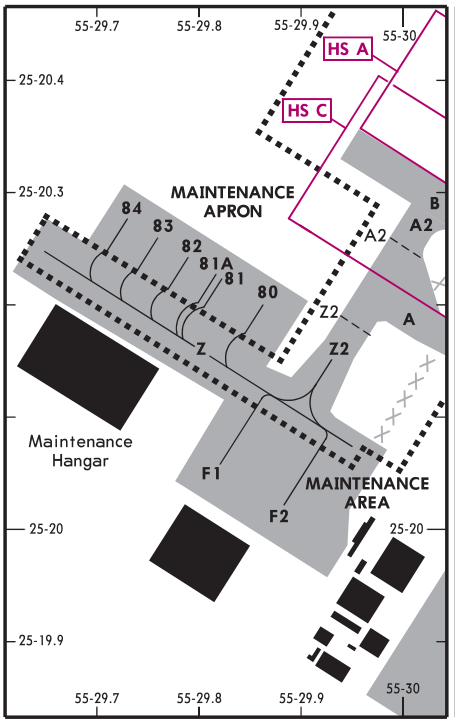

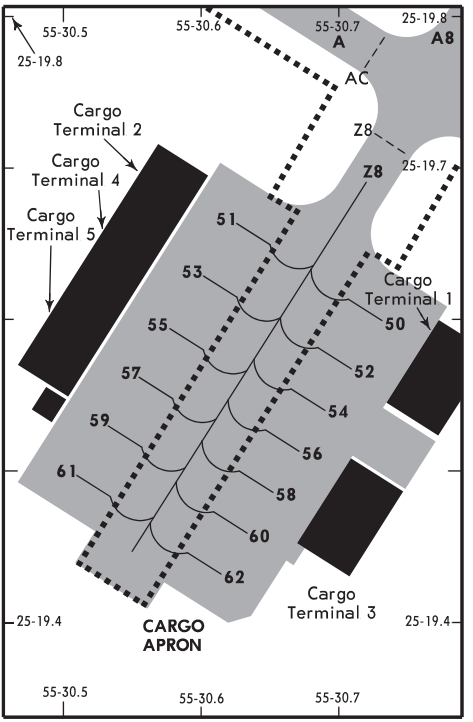

CHANGES: Hot Spots.

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INS COORDINATES

STAND No.	COORDINATES	STAND No.	COORDINATES
1A thru 1C	N25 19.3 E055 31.4	56	N25 19.5 E055 30.7
2 thru 4	N25 19.3 E055 31.3	57	N25 19.6 E055 30.6
5 thru 7	N25 19.4 E055 31.2	58	N25 19.5 E055 30.6
8	N25 19.4 E055 31.1	59	N25 19.5 E055 30.5
9 thru 13	N25 19.5 E055 31.1	60	N25 19.5 E055 30.6
14	N25 19.6 E055 31.0	61	N25 19.5 E055 30.5
15	N25 19.5 E055 31.1	62	N25 19.4 E055 30.6
16 thru 18	N25 19.5 E055 31.0	80	N25 20.2 E055 29.9
21	N25 19.6 E055 31.0	81 thru 82	N25 20.2 E055 29.8
22	N25 19.6 E055 30.9	83	N25 20.3 E055 29.8
23	N25 19.6 E055 31.0	84	N25 20.3 E055 29.7
24	N25 19.6 E055 30.9	F1	N25 20.0 E055 29.8
25	N25 19.5 E055 30.9	F2	N25 20.0. E055 29.9
26	N25 19.6 E055 30.9		
50	N25 19.6 E055 30.7		
51	N25 19.7 E055 30.6		
52	N25 19.6 E055 30.7		
53	N25 19.6 E055 30.6		
54	N25 19.5 E055 30.7		
55	N25 19.6 E055 30.6		

CHANGES: None.

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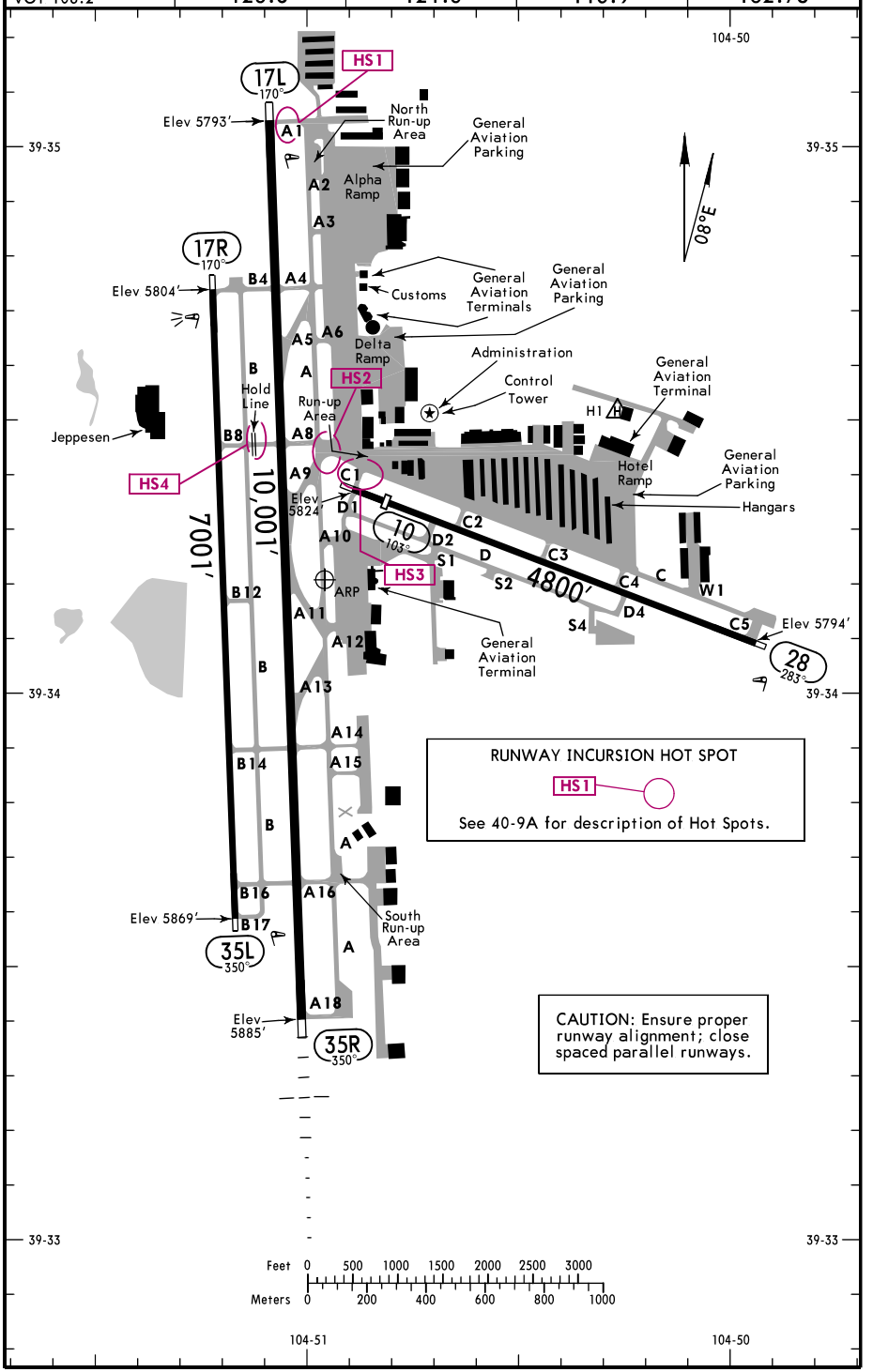
ATIS 120.3 VOT 108.2	CENTENNIAL Clearance	Ground	Tower	DENVER Departure (R)
	128.6	121.8	118.9	132.75



CHANGES: None.

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GENERAL

For conventional SIDs see KDEN. For conventional STARs see KDEN.
Helicopter operations contact FBO for landing zone location. Helicopter operations on front ramp not advised.
All aircraft below certificated 70,000 lbs max gross take-off weight and stage III aircraft up to 75,000 lbs max gross take-off weight may operate. One time exception authorized by executive director.
Birds in vicinity of airport.
Noise abatement procedures in effect.
Multiple large power lines approximately 3 NM south of Rwy 35R and Rwy 35L.

ADDITIONAL RUNWAY INFORMATION

RWY			USABLE LENGTHS — LANDING BEYOND — Threshold	Glide Slope	TAKE-OFF	WIDTH
10	MIRL PAPI-L (angle 3.00°)	grooved	4400′			75′
28	MIRL REIL PAPI-L (angle 3.0°)	grooved				
17R	MIRL REIL PAPI-L (angle 3.0°)	grooved				75′
35L	MIRL REIL PAPI-R (angle 3.0°)	grooved				
17L	MIRL PAPI-L (angle 3.0°)	grooved				100′
35R	MIRL MALSR PAPI-L (angle 3.0°)	grooved		8926′		

RUNWAY INCURSION HOT SPOTS HS1

For information only, not to be construed as ATC instructions.

HS1 Pilots instructed to taxi to Rwy 17L and monitor tower sometimes enter the rwy without ATC clearance. Expect to hold short.

HS2 Twy A, Twy A8, Twy A9 and Twy C1 congested intersections.

HS3 Rwy 10 hold line on Twy C1 is located 30′ from edge of ramp.

HS4 Pilots landing Rwy 17R and instructed to hold short Rwy 17L sometimes enter or cross Rwy 17L without ATC clearance. Expect to hold short on Twy B at Twy B8.

TAKE-OFF & OBSTACLE DEPARTURE PROCEDURE

	Rwys 10, 28, 35L/R		Rwy 17L		Rwy 17R	
	Adequate Vis Ref	STD	With Mim climb of 257′/NM to 6800′		With Mim climb of 372′/NM to 6800′	
			Adequate Vis Ref	STD	Adequate Vis Ref	STD
1 & 2 Eng	¼	1	¼	1	¼	1
3 & 4 Eng		½		½		½

OBSTACLE DP

Rwy 10 - When departing on courses between 333° clockwise to 162° from departure end of runway climb on heading 103° to 6600′ before turning right. All other courses: climbing left turn to intercept DEN VOR R-194 to DEN VOR, thence...

Rwy 17L/R - Climb on a heading between 350° clockwise to 162° from departure end of runway. All other courses: climbing left turn to intercept DEN VOR R-199 to DEN VOR, thence...

Rwy 28 - Climb on a heading between 333° clockwise to 103° from departure end of runway. All other courses: climbing right turn to intercept DEN VOR R-210 to DEN VOR, thence...

Rwy 35L/R - Climb on a heading between 333° clockwise to 162° from departure end of runway. All other courses: climb on heading 350° to intercept DEN VOR R-211 to DEN VOR, thence...

...climb in DEN VOR holding pattern (hold south, RIGHT turns, 343° inbound) TO 16,500′ before proceeding on course.

(For ODP TAKEOFF OBSTACLE NOTES see 40-9A1)

DIVERSE VECTOR AREA (Radar Vectors) (AMEND 0)
Rwy 10: Headings as assigned by ATC; requires minimum climb gradient of 203′/NM to 6800′.
Rwy 17L: Headings as assigned by ATC; requires minimum climb gradient of 287′/NM to 8000′.
Rwy 17R: Headings as assigned by ATC; requires minimum climb gradient of 372′/NM to 7400′.
Rwy 28: Headings as assigned by ATC.
Rwy 35L: Headings as assigned by ATC.
Rwy 35R: Headings as assigned by ATC.

FOR FILING AS ALTERNATE

	ILS Rwy 35R	RNAV (GPS) Rwy 28	RNAV (GPS) Rwy 35R LOC Rwy 35R	RNAV (GPS) Rwy 17L
A	600-2	800-2	800-2	800-2
B				
C			900-2½	900-2½
D			900-2¾	1100-3

AMEND 5A

CHANGES: Notes.

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ODP TAKEOFF OBSTACLE NOTES

- RWY 10:
Vehicle on road 196′ from DER, 408′ left of centerline, 5799′ MSL. Vehicle on road 283′ from DER, 402′ left of centerline, 5804′ MSL. Vehicle on road 389′ from DER, 396′ left of centerline, 5809′ MSL. Vehicle on road 483′ from DER, 618′ right of centerline, 5815′ MSL. Vehicle on road 521′ from DER, 393′ left of centerline, 5815′ MSL. Vehicle on road 611′ from DER, 569′ right of centerline, 5817′ MSL. Vehicle on road 644′ from DER, 401′ left of centerline, 5818′ MSL. Vehicle on road 719′ from DER, 528′ right of centerline, 5818′ MSL. Vehicle on road 781′ from DER, 425′ left of centerline, 5823′ MSL. Tree, vehicle on road beginning 835′ from DER, 458′ right of centerline, up to 20′ AGL/5828′ MSL. Vehicle on road 927′ from DER, 464′ left of centerline, 5827′ MSL. Terrain 958′ from DER, 624′ right of centerline, 5835′ MSL. Terrain, vehicle on road beginning 1013′ from DER, 254′ right of centerline, up to 5836′ MSL. Terrain, vehicle on road beginning 1113′ from DER, 119′ right of centerline, up to 5839′ MSL. Vehicle on road beginning 1138′ from DER, 535′ left of centerline, up to 5833′ MSL. Fence, vehicle on road, terrain beginning 1210′ from DER, 3′ right of centerline, up to 5841′ MSL. Vehicle on road beginning 1237′ from DER, 31′ left of centerline, up to 5834′ MSL. Terrain beginning 1282′ from DER, 229′ right of centerline, up to 5843′ MSL. Building, vehicle on road, pole beginning 1384′ from DER, 71′ left of centerline, up to 33′ AGL/5854′ MSL. Pole, vehicle on road, terrain beginning 1470′ from DER, 204′ right of centerline, up to 5862′ MSL. Building, pole, vehicle on road, fence beginning 1562′ from DER, 194′ right of centerline, up to 40′ AGL/5877′ MSL. Building, fence, pole, vertical structure beginning 1600′ from DER, 229′ right of centerline, up to 41′ AGL/5879′ MSL. Building, tree beginning 1680′ from DER, 306′ right of centerline, up to 46′ AGL/5882′ MSL. Building, fence, vehicle on road, pole, tree, terrain beginning 1685′ from DER, 31′ right of centerline, up to 5885′ MSL. Building, pole, terrain, vehicle on road beginning 2056′ from DER, 34′ right of centerline, up to 5889′ MSL. Building, pole beginning 2270′ from DER, 662′ right of centerline, up to 38′ AGL/5892′ MSL.

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- RWY 17L:
Lighting 10′ from DER, 9′ right of centerline, 2′ AGL/5886′ MSL. Pole 1755′ from DER, 882′ left of centerline, 31′ AGL/5929′ MSL. Tree 2533′ from DER, 342′ left of centerline, 26′ AGL/5949′ MSL. Tree 2579′ from DER, 342′ left of centerline, 27′ AGL/5950′ MSL. Tree 2867′ from DER, 455′ right of centerline, 44′ AGL/5959′ MSL. Tree 2973′ from DER, 1211′ right of centerline, 35′ AGL/5963′ MSL. Tree 2974′ from DER, 948′ right of centerline, 42′ AGL/5964′ MSL. Trees beginning 2997′ from DER, 748′ right of centerline, up to 50′ AGL/5967′ MSL. Tree, lighting beginning 3025′ from DER, 769′ right of centerline, up to 56′ AGL/5970′ MSL. Tree 3309′ from DER, 747′ left of centerline, 35′ AGL/5970′ MSL. Tree 3344′ from DER, 756′ left of centerline, 36′ AGL/5974′ MSL. Trees beginning 3444′ from DER, 1225′ right of centerline, up to 50′ AGL/5981′ MSL. Building beginning 3849′ from DER, 1479′ left of centerline, up to 59′ AGL/5988′ MSL. Tree 4767′ from DER, 893′ right of centerline, 49′ AGL/6007′ MSL.
- RWY 17R:
Terrain 9′ from DER, 96′ left of centerline, 5869′ MSL. Terrain 10′ from DER, 273′ right of centerline, 5872′ MSL. Vehicle on road, terrain beginning 75′ from DER, 302′ right of centerline, up to 5885′ MSL. General utility 103′ from DER, 253′ left of centerline, 7′ AGL/5875′ MSL. Wind indicator, terrain beginning 118′ from DER, 443′ left of centerline, up to 5883′ MSL. Vehicle on road, terrain beginning 190′ from DER, 353′ right of centerline, up to 5887′ MSL. Pole, fence, terrain beginning 525′ from DER, 196′ right of centerline, up to 5918′ MSL. Pole 2190′ from DER, 1029′ right of centerline, 31′ AGL/5928′ MSL. Pole 2289′ from DER, 863′ right of centerline, 30′ AGL/5935′ MSL. Pole beginning 2361′ from DER, 255′ right of centerline, up to 32′ AGL/5942′ MSL. Pole 2738′ from DER, 1069′ right of centerline, 42′ AGL/5947′ MSL. Pole 2824′ from DER, 904′ right of centerline, 43′ AGL/5948′ MSL. Pole 3108′ from DER, 1151′ right of centerline, 27′ AGL/5949′ MSL. Tree 3163′ from DER, 568′ right of centerline, 66′ AGL/5975′ MSL. Building 3226′ from DER, 888′ right of centerline, 73′ AGL/5996′ MSL. Building beginning 3261′ from DER, 820′ right of centerline, up to 87′ AGL/6010′ MSL. Building, tree, pole beginning 3281′ from DER, 492′ right of centerline, up to 88′ AGL/6021′ MSL. Building beginning 5084′ from DER, 1038′ right of centerline, up to 79′ AGL/6023′ MSL. Building 1 NM from DER, 1861′ right of centerline, 64′ AGL/6030′ MSL.
- RWY 28:
Building 57′ from DER, 495′ right of centerline, 34′ AGL/5858′ MSL. Pole, wind indicator, terrain beginning 99′ from DER, 183′ left of centerline, up to 5832′ MSL. Terrain 473′ from DER, 578′ left of centerline, 5836′ MSL.
- RWY 35L:
Terrain 36′ from DER, 163′ right of centerline, 5805′ MSL. Trees beginning 158′ from DER, 448′ left of centerline, up to 35′ AGL/5820′ MSL.
- RWY 35R:
Lighting 8′ from DER, 30′ right of centerline, 2′ AGL/5795′ MSL. Lighting 8′ from DER, 30′ left of centerline, 2′ AGL/5794′ MSL.

AMEND 5A

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ATIS	ACARS:	NICE Delivery	NICE Ground	Tower	NICE Approach (DEP)
136.580 (French 129.605)	D-ATIS DCL	121.780	121.705	118.7 123.150	130.830

FOR A380 ONLY

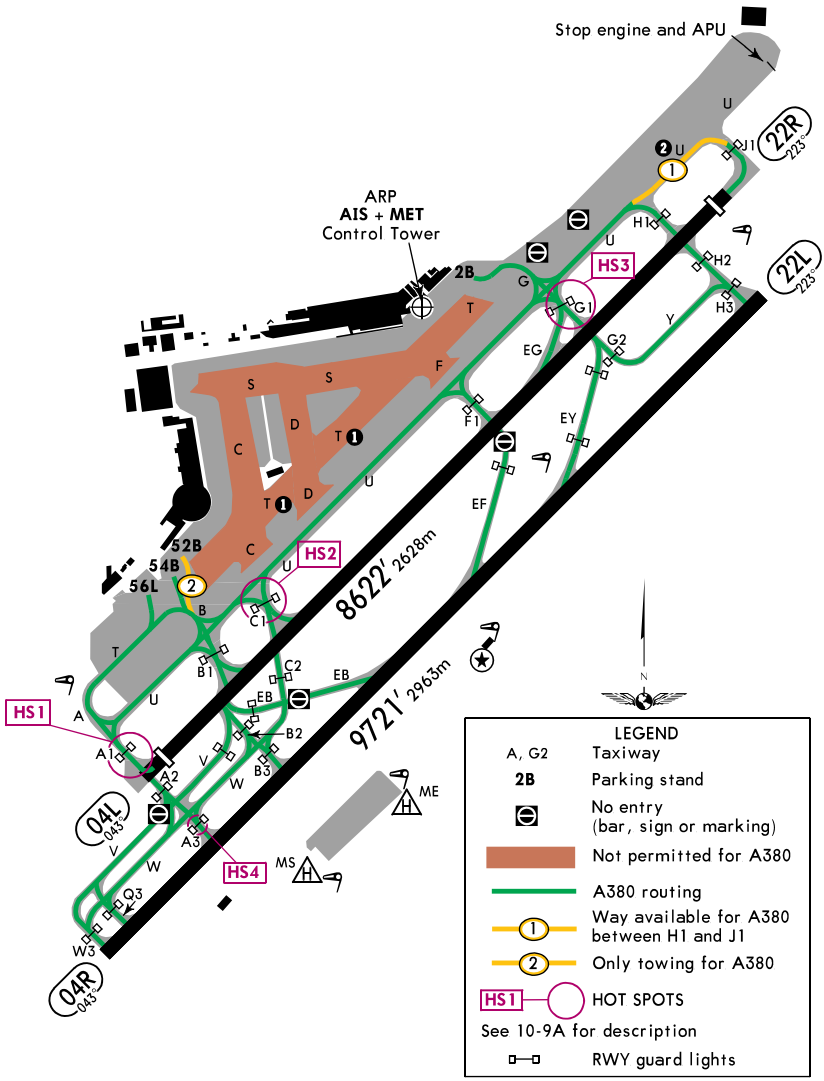
SPECIFIC INSTRUCTIONS

Outer engines on idle thrust. If possible, use BRAKE TO VACATE.
Arrival on 52B: ACFT stopped on TWY T, towed with engines off from TWY T.
Departure from 52B or 54B: ACFT pushed back on TWY T, nose facing EAST to push-back point 54C.
Departure from 56L: ACFT pushed back on TWY T, nose facing EAST to push-back point 58.
Departure from 2B: ACFT is pushed back on TWY T, then towed to push-back point A124 on TWY G.

WINGSPAN RESTRICTIONS

❶ TWY T between TWYs C and F MAX wingspan 171'/52m.
❷ TWY U between TWYs H1 and J1 MAX wingspan 213'/65m.

125



CHANGES: Communication, ground movement, pushback instructions.

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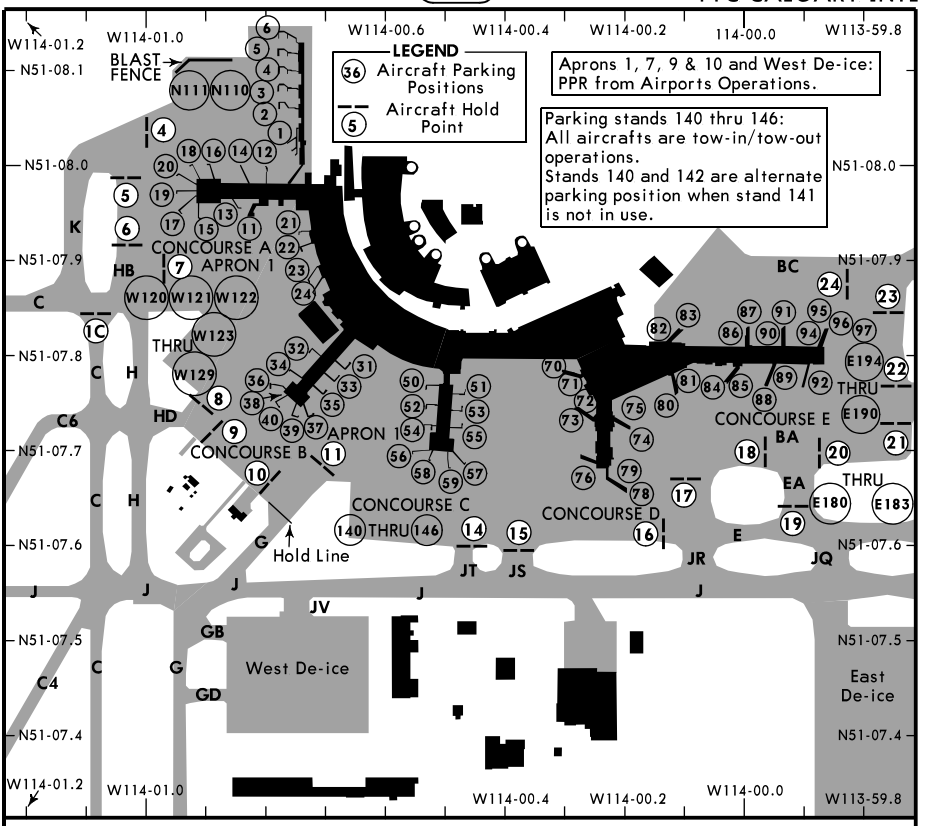

Apron 1 Exit Routing Procedure and Restrictions

Routing
Apron 1 Advisory (121.3 - limited hours) will normally direct departing acft to a taxi position fix dependent upon active runways.
Twy JT restricted to aircraft with wingspan 118′ (36m) or less.
Twy GB is restricted to aircraft with wingspan of 118′ (36m) or less, and is one-way westbound.
Twy GD restricted to one-way westbound.

PARKING POSITION COORDINATES

POSITION No.	COORDINATES	POSITION No.	COORDINATES
1, 2	N51 08.0 W114 00.8	52, 54, 56	N51 07.7 W114 00.6
3 thru 6	N51 08.1 W114 00.8	53, 55, 57	N51 07.7 W114 00.4
N110, N111	N51 08.1 W114 00.9	58, 59	N51 07.7 W114 00.5
11	N51 07.9 W114 00.8	70 thru 72	N51 07.8 W114 00.3
12, 14	N51 08.0 W114 00.8		
		73, 76	N51 07.7 W114 00.3
13, 15, 17	N51 07.9 W114 00.9	74, 75, 79	N51 07.7 W114 00.2
16, 18	N51 08.0 W114 00.9	78	N51 07.6 W114 00.2
19, 20	N51 08.0 W114 01.0	80 thru 84	N51 07.8 W114 00.1
21, 22	N51 07.9 W114 00.8	85 thru 88, 90	N51 07.8 W114 00.0
23, 24	N51 07.9 W114 00.7		
		89, 91, 92, 94, 95	N51 07.8 W113 59.9
W120	N51 07.9 W114 01.0	96, 97	N51 07.8 W113 59.8
W121, W122	N51 07.9 W114 00.9	140 thru 146	N51 07.6 W114 00.5
W123 thru W129	N51 07.8 W114 00.9	E180 thru E183	N51 07.6 W113 59.8
31	N51 07.8 W114 00.6	E190 thru E192	N51 07.7 W113 59.8
32, 33	N51 07.8 W114 00.7	E193, E194	N51 07.8 W113 59.8
34, 36, 38	N51 07.8 W114 00.8		
35, 37	N51 07.7 W114 00.7		
39, 40	N51 07.7 W114 00.8		
50	N51 07.8 W114 00.6		
51	N51 07.8 W114 00.4		

CHANGES: New aircraft parking positions at Apron I Concourse C.

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LOW VISIBILITY PROCEDURES (RVR less than 1200 to 600 FT)
REDUCED VISIBILITY PROCEDURES (RVR less than 2600 to 1200 FT)

LOW/REDUCED VISIBILITY TAXI ROUTES

Anticipated taxi routes will be identified, and should portions thereof be unavailable, alternate routes will be identified.

In the event that an aircraft must taxi across the airfield for departure, the RVR values along the taxi route must be used to determine visibility limitations.

Once an aircraft has commenced taxi for takeoff, or taxi after landing, and the visibility falls below the published level of service on the given taxiway, the aircraft may continue to taxi.

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Runway 08/26 may be used as a taxiway.

Aircraft requiring imminent departure are permitted to tow during RVO but must obtain taxi routing clearances and follow all applicable airside traffic directives guidelines. Tow operations below 1200 RVR are not authorized on manoeuvring areas.

Engine run ups will not be allowed.

DEPARTURES

Departures during LVO will be on Runway 17L/35R. During RVO, Runway 17R/35L will be the preferential runway. The departure runway will be identified.

Runways 17L/35R, 17R/35L and 11/29 are equipped with high intensity edge lights and threshold/end lights. Runway 17L/35R is equipped with centerline lights.

Departure taxi routes will be the most direct route to the threshold. Intersection departures are not permitted. If the primary route is unavailable, Calgary Tower may recommend a secondary route.

Exceptions for departures:

Taxi to Runway 11 may be approved from Apron VII and IX when RVR 11 is 1200 or greater.

Taxi to Runway 11 may be approved from Apron I, East Deice and West Deice when RVR 11 and 17R are 1200 or greater.

Taxi to Runway 17R may be approved from Apron I, IX, East Deice and West Deice when RVR 17R is 1200 or greater.

Taxi to Runway 17R may be approved from Apron VII when RVR 11 and 17R are 1200 or greater.

Taxi to Runway 35L may be approved from Apron III, IV, V, VI and VIII when RVR 35L is 1200 or greater.

Taxi to Runway 29 may be approved from Apron I & II and IX when RVR 17R and RVR 29 are 1200 or greater.

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Sequencing of Ground Movements for Take-off

Pilots must follow instructions on Sequencing of Ground Movements for Take-off as described in CAP GEN Operating Minima.

Surface Movement Ground Control System

All taxi hold positions on taxiways leading to Runway 17L/35R are equipped with stop bars.

Prior to manoeuvring on aprons, aircraft are recommended to contact Apron Advisory Service.

AT NO TIME SHALL A PILOT CROSS AN ILLUMINATED RED STOP BAR

ARRIVALS

Arrivals during LVO will be on Runway 17L/35R. During RVO, Runway 17L/35R will be the preferential runway. ATC will designate the arrival runway.

Calgary Tower will direct arrival taxi routes in order to ensure the aircraft exits the runway at the first available exit, and will provide instruction from the runway to the apron.

Airport Services And Equipment Available Under Low or Reduced Visibility Operations

Airport Surface Detection Equipment (ASDE)

Upon request "follow-me" service can be provided to aircraft, Request should be made with as much notice as possible.

Runway Level of Service	
Runway	Certification
11	RVR 1200
29	RVR 1200
17L	RVR 600
35R	RVR 600
17R	RVR 1200
35L	RVR 1200

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CYYC/YYC
YYC CALGARY INTL

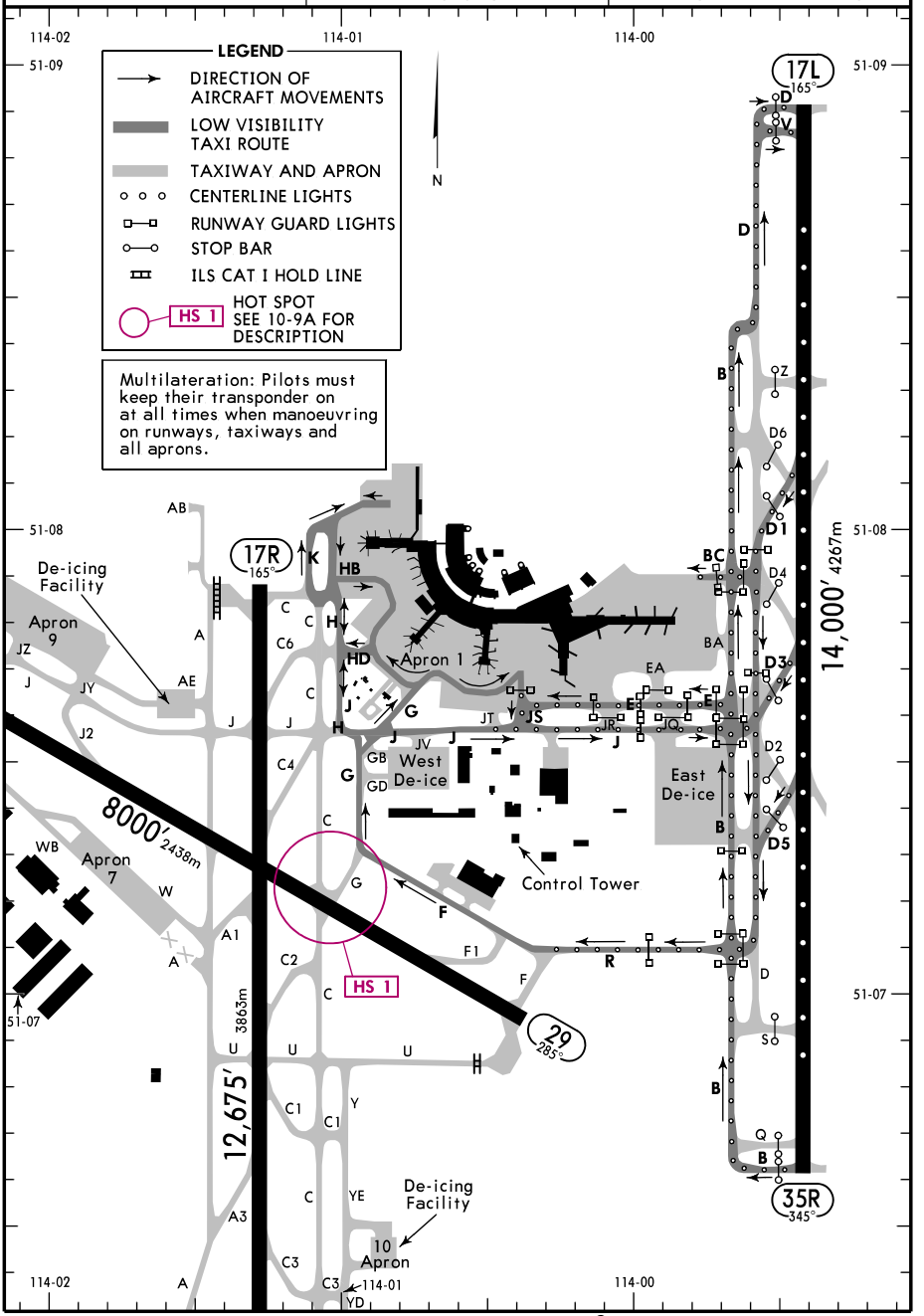
LESS THAN RVR 1200 TO 600

CALGARY, ALTA
LOW VISIBILITY TAXI CHART
LAND RWY 17L, DEPART RWY 17L

For Low Visibility Procedures See 10-9C and 10-9D

D-ATIS	ACARS: D-ATIS PDC	CALGARY Clearance	Ground West	Ground East	*Apron 1
128.225		120.825	121.9	125.35	121.3

Tower West	Tower East	EDMONTON Radio	CALGARY Departure West	CALGARY Departure East
118.4	118.7	123.375	124.52	119.8



CHANGES: Apron 1 and taxiway E and JR depiction.

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CYYC/YYC

YYC CALGARY INTL

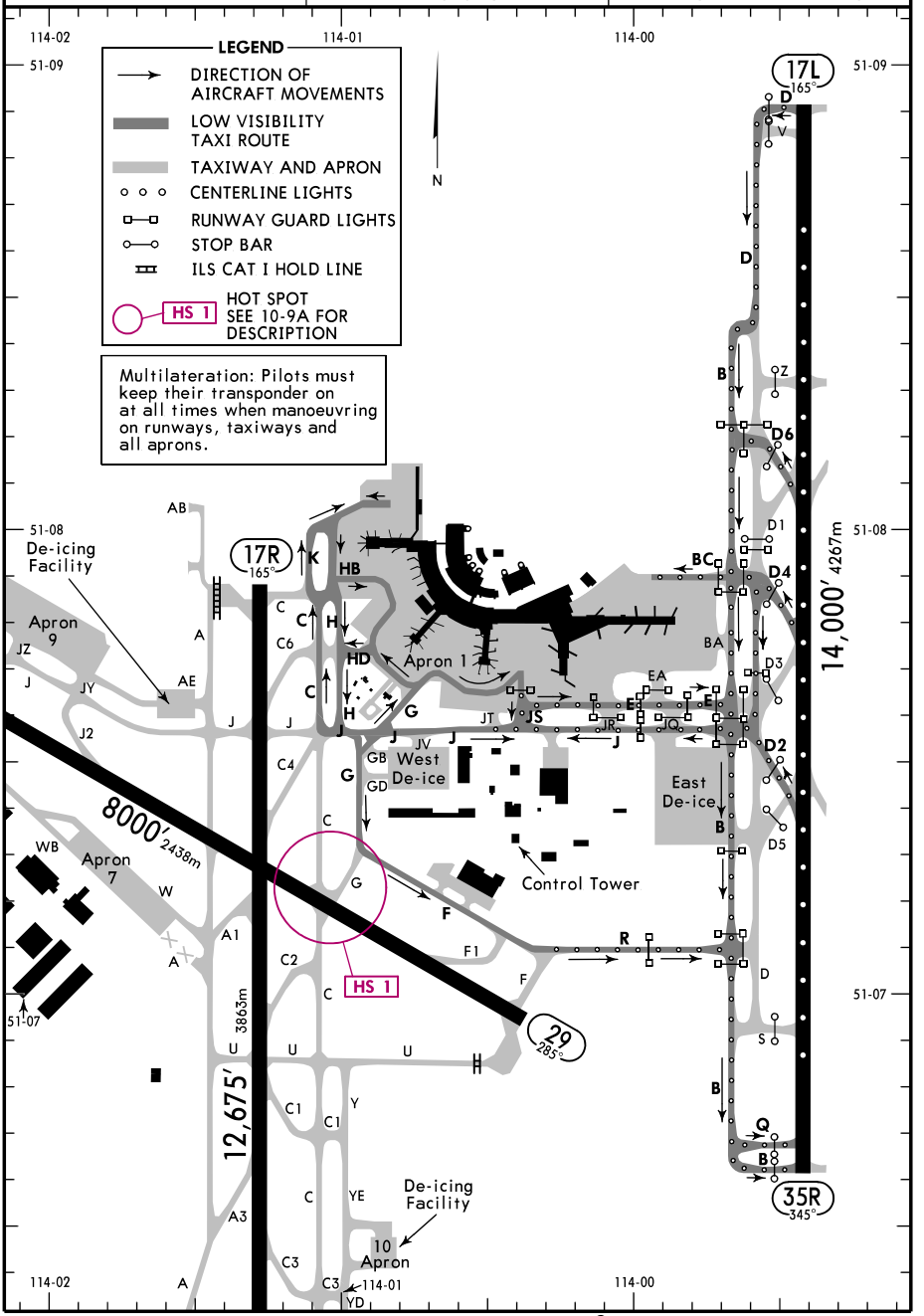
LESS THAN RVR 1200 TO 600

CALGARY, ALTA
LOW VISIBILITY TAXI CHART
LAND RWY 35R, DEPART RWY 35R

For Low Visibilty Procedures See 10-9C and 10-9D

D-ATIS	ACARS: D-ATIS PDC	CALGARY Clearance	Ground West	Ground East	*Apron 1
128.225		120.825	121.9	125.35	121.3

Tower West	Tower East	EDMONTON Radio	CALGARY Departure West	CALGARY Departure East
118.4	118.7	123.375	124.52	119.8



CHANGES: Apron 1 and taxiway E and JR depiction.

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BRIEFING STRIP™

D-ATIS Arrival	BOSTON Approach (R)	BOSTON Tower West	BOSTON Tower East	Ground	Helicopter
135.0	120.6	128.8	132.225	121.75	121.9	124.725

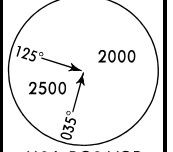
LOC ILIP	Final Apch Crs	NIMOY	ILS DA(H)	Apt Elev 19′
110.7	330°	1500′(1484′)	216′(200′)	TDZE 16′

MISSED APCH: Climb to 1500′ then climbing RIGHT turn to 3000′ outbound on BOS VOR R-030 to WAXEN/D14.0 BOS and hold.

Alt Set: INCHES | Trans level: FL 180 | Trans alt: 18000′

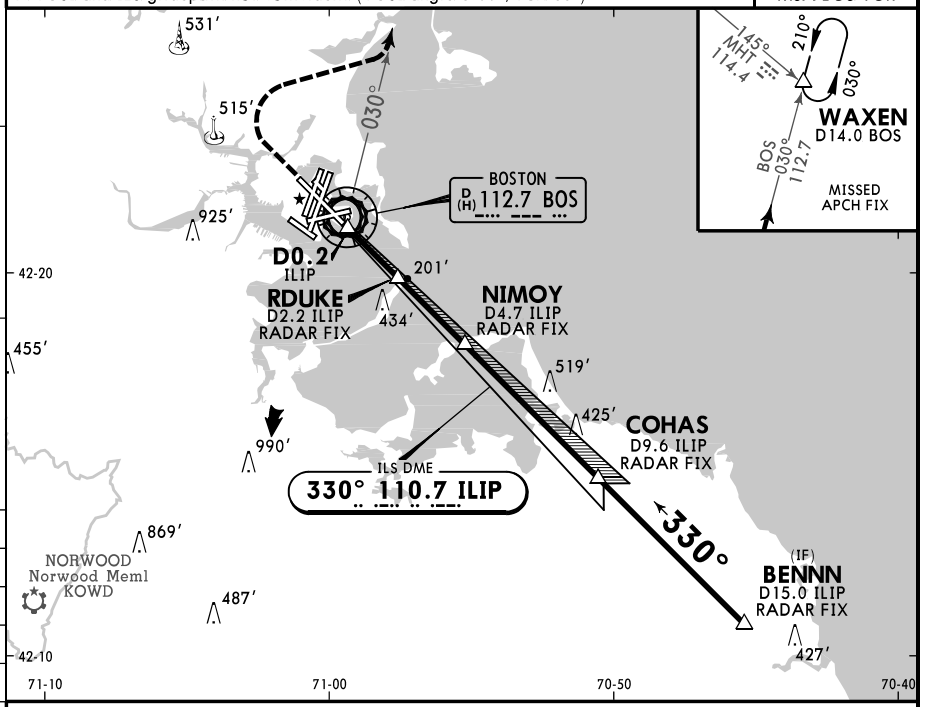
RADAR required for procedure entry, DME.

1. VGSI and ILS glidepath not coincident (VGSI angle 3.00°/TCH 68′).

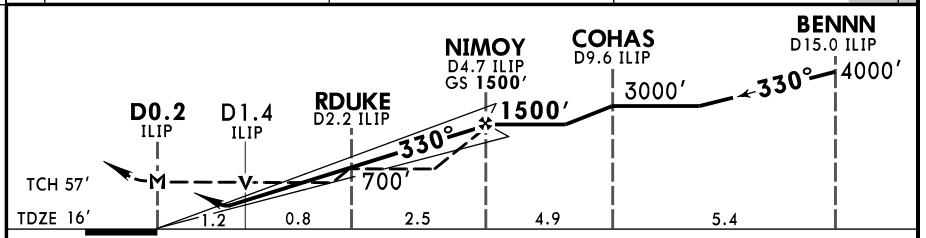


MSA BOS VOR

129



1 in=5 NM



Gnd speed-Kts	70	90	100	120	140	160
GS 3.00°	372	478	531	637	743	849
MAP at D0.2 ILIP or NIMOY to MAP 4.5	3:51	3:00	2:42	2:15	1:56	1:41

ALSF-II PAPI | 1500′ ↑ | 3000′ RT | BOS on 112.7 R-030 | WAXEN

TERPS STRAIGHT-IN LANDING RWY 33L

	ILS DA(H) 216′(200′) FULL	ILS TDZ/CL out	ILS ALS out	LOC (GS out) MDA(H) 460′(444′)	LOC ALS out
A	RVR 18 or 1/2	[1] RVR 24 or 1/2	RVR 40 or 3/4	RVR 24 or 1/2	RVR 50 or 1
B					
C				RVR 45 or 7/8	1 3/8
D					

CIRCLE-TO-LAND Not Authorized to Rwy 14

Max Kts	MDA(H)
90	940′(921′) -1¼
120	1040′(1021′) -1½
140	[2] 1040′(1021′)-3
165	

[1] RVR 18 with Flight Director or Autopilot or HUD to DA. [2] Not Authorized West of Rwy 4L and Rwy 15R.

TERPS AMEND 5F 17 JUN 2021

CHANGES: Altn missed apch removed, notes, circling minimums.

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KBOS/BOS
LOGAN INTL

JEPPESEN
11 JUN 21
Eff 17 Jun
(11-5A)

BOSTON, MASS
ILS Rwy 33L CAT II & III

BRIEFING STRIP™

D-ATIS Arrival	BOSTON Approach (R)	BOSTON Tower West	BOSTON Tower East	Ground		Helicopter
135.0	120.6	128.8	132.225	121.75	121.9	124.725

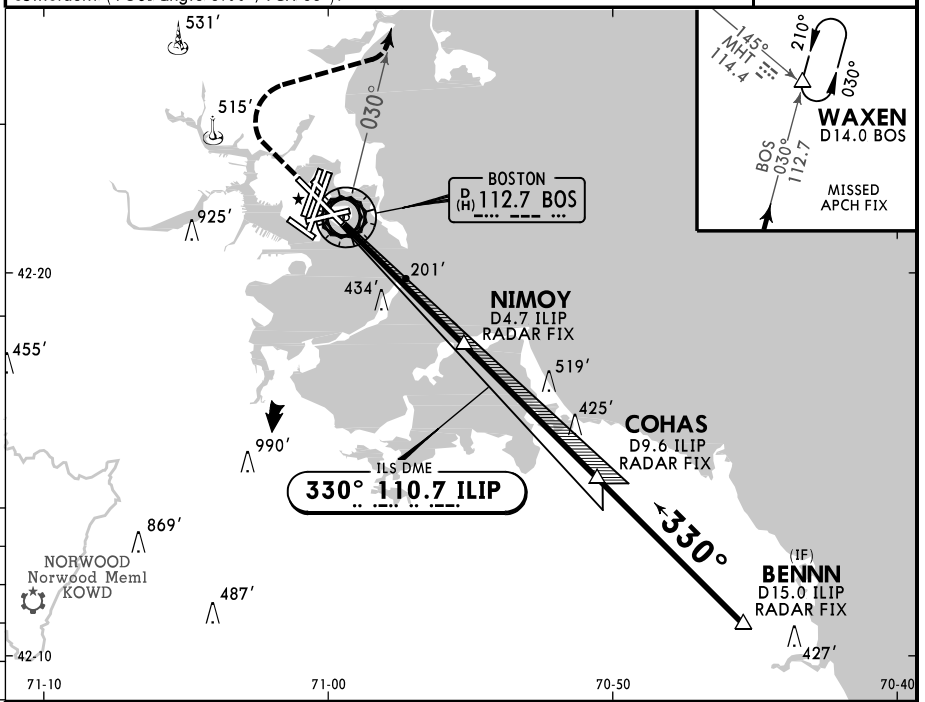
LOC ILIP	Final Apch Crs	NIMOY	CAT III	CAT II	Apt Elev 19'
110.7	330°	1500' (1484')	Refer to Minimums	RA 116' DA(H) 116'(100')	TDZE 16'

MISSED APCH: Climb to 1500' then climbing RIGHT turn to 3000' outbound on BOS VOR R-030 to WAXEN/D14.0 BOS and hold.

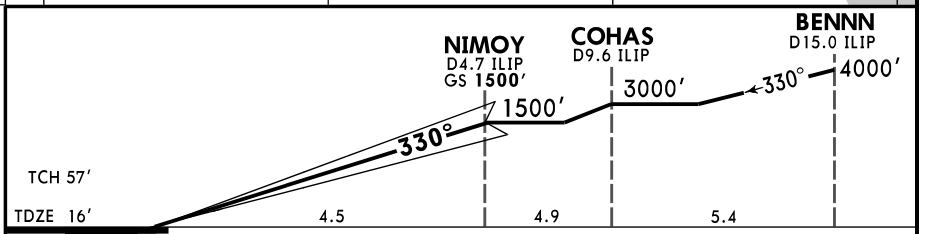
Alt Set: INCHES — Trans level: FL 180 — Trans alt: 18000'

RADAR required for procedure entry, DME.

1. Special Aircrew & Acft Certification Required. 2. VGSI and ILS glidepath not coincident (VGSI angle 3.00°/TCH 68').



1 in=5 NM



Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	372	478	531	637	743	849

ALSF-II — PAPI — 1500' — 3000' RT — BOS on 112.7 R-030 — WAXEN

TERPS — STRAIGHT-IN LANDING RWY 33L

	CAT III ILS	CAT II ILS RA 116' DA(H) 116'(100')
A	RVR 6	1 RVR 12
B		
C		
D		

1 RVR 10 authorized with specific OPSPEC, MSPEC, or LOA approval and use of autoland or HUD to touchdown.

TERPS AMEND 5F 17 JUN 2021

CHANGES: Altn missed apch removed, notes.

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D-ATIS Arrival	BOSTON Approach (R)	BOSTON Tower West	BOSTON Tower East	Ground	Helicopter
135.0	120.6	128.8	132.225	121.75 121.9	124.725

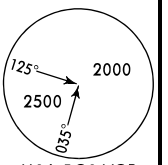
LOC ILIP	Final Apch Crs	NIMOY	SA CAT I ILS	Apt Elev 19′
110.7	330°	1500′(1484′)	RA 166′ DA(H) 166′(150′)	TDZE 16′

MISSED APCH: Climb to 1500′ then climbing RIGHT turn to 3000′ outbound on BOS VOR R-030 to WAXEN/D14.0 BOS and hold.

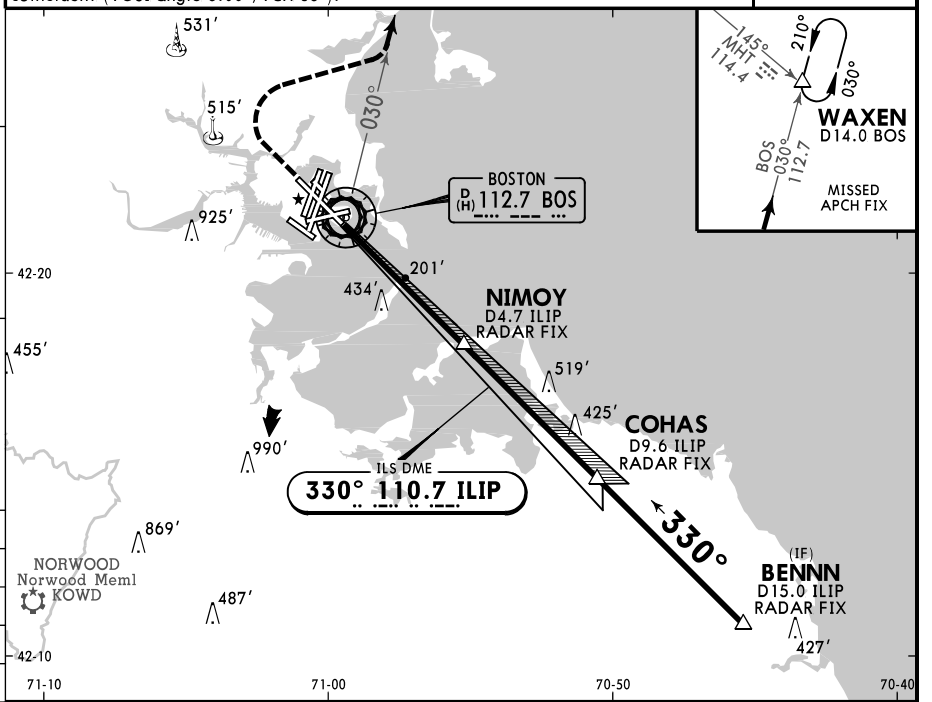
Alt Set: INCHES | Trans level: FL 180 | Trans alt: 18000′

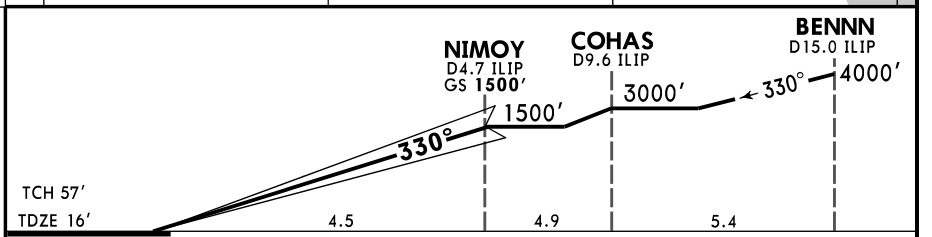
RADAR required for procedure entry, DME.

1. Special Aircrew & Acft certification required. 2. VGSI and ILS glidepath not coincident (VGSI angle 3.00°/TCH 68′).



MSA BOS VOR





Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	372	478	531	637	743	849

ALSF-II PAPI | 1500′ | 3000′ RT | BOS on 112.7 R-030 | WAXEN

TERPS

STRAIGHT-IN LANDING RWY 33L

1 SA CAT I ILS

RA 166′

DA(H) 166′(150′)

A	RVR 14
B	
C	
D	

1 Requires specific OPSPEC, MSPEC, or LOA approval.

CHANGES: Altn missed apch removed, notes.

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BRIEFING STRIP™

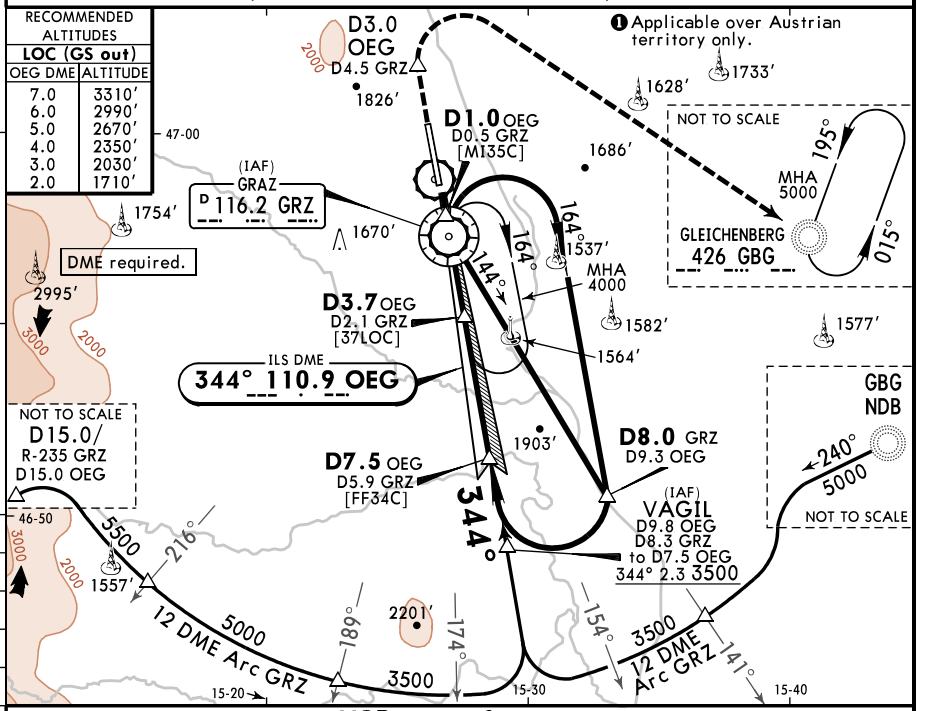
*D-ATIS	*GRAZ Radar (APP)		*GRAZ Tower
126.130	119.3	120.440	118.2

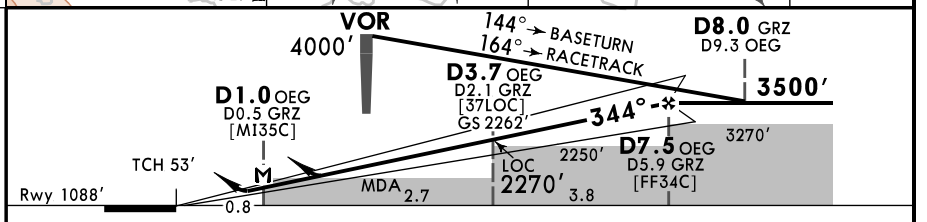
LOC OEG	Final Apch Crs	D7.5 OEG	ILS DA(H) Refer to Minimums	Apt Elev 1120′ Rwy 1088′
110.9	344°	3500′(2412′)		

MISSED APCH: Climb STRAIGHT AHEAD, at D3.0 OEG turn RIGHT (MAX 210 KT) DIRECT to GBG NDB climbing to 5000′ and hold.

MSA GRZ VOR: 120° 8200 ❶; 235° 3500 ❶; 330° 8800 ❶

Alt Set: hPa | Rwy Elev: 39 hPa | Trans level: By ATC | Trans alt: 10000′





Gnd speed-Kts		70	90	100	120	140	160
ILS GS or LOC Descent Angle	3.00°	372	478	531	637	743	849
MAP at D1.0 OEG/D0.5 GRZ							

ALSF-II
REIL
PAPI

D3.0 OEG

Std/State STRAIGHT-IN LANDING

ILS
DA(H) C: **1292′**(204′)
AB:**1288′**(200′) D: **1303′**(215′)

LOC (GS out)
CDFA
❷ DA/MDA(H)**1430′**(342′)

CIRCLE-TO-LAND
Not authorized
West of airport

	FULL	TDZ or CL out	ALS out		TDZ or CL out	ALS out
A	R550m	❶ R550m	R1200m	R900m	R900m	R1500m
B						
C						R1600m
D						

Max Kts	MDA(H)		
100	1670′	(550′)	V1500m
135	1670′	(550′)	V1600m
180	2070′	(950′)	V2400m
205	2370′	(1250′)	V3600m

PANS OPS

❶ R750m when a Flight Director or Autopilot or HUD to DA is not used. ❷ VNAV DA(H) in lieu of MDA(H) depends on operator policy.

CHANGES: MSA, NDB withdrawn, recommended altitudes, SMA, minimums.

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LOWG/GRZ
GRAZ

JEPPESEN

2 JUN 23
Eff 15 Jun

(11-1A)

GRAZ, AUSTRIA
CAT II/III ILS Rwy 34C

BRIEFING STRIP™

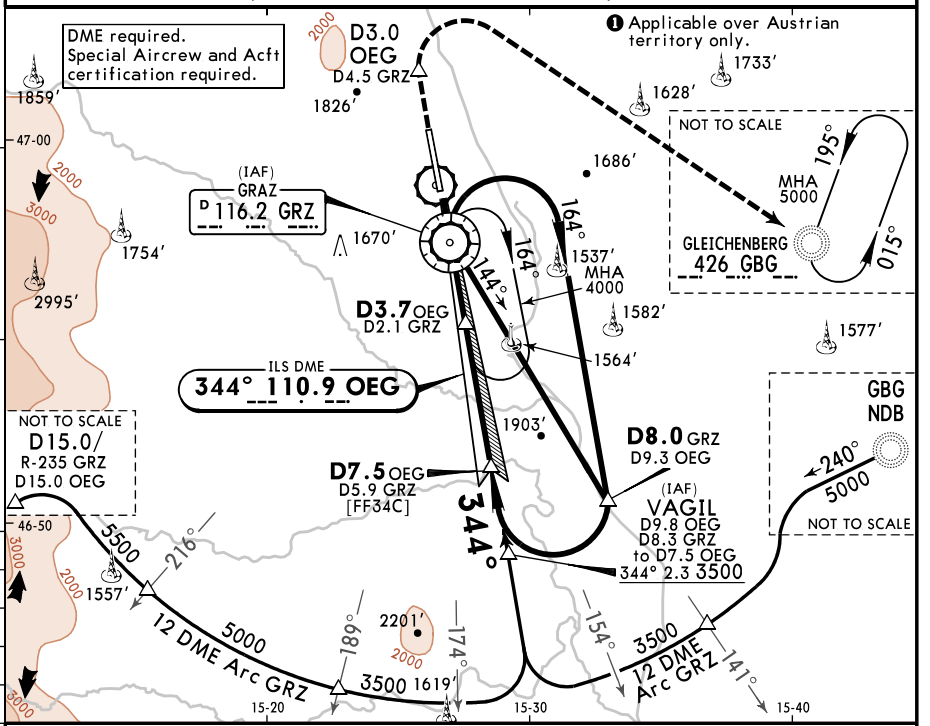
*D-ATIS	*GRAZ Radar (APP)		*GRAZ Tower
126.130	119.3	120.440	118.2

LOC OEG	Final Apch Crs	D7.5 OEG	CAT IIIB, IIIA & II ILS Refer to Minimums	Apt Elev 1120′
110.9	344°	3500′(2412′)		Rwy 1088′

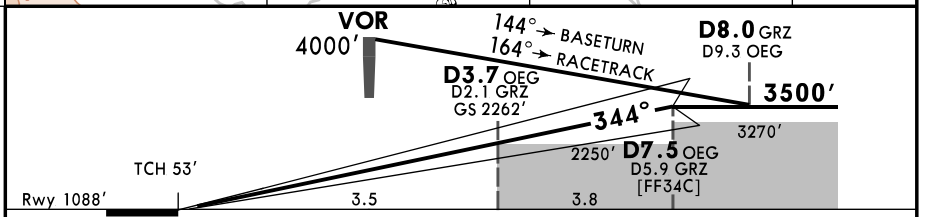
MISSED APCH: Climb STRAIGHT AHEAD, at D3.0 OEG turn RIGHT (MAX 210 KT) DIRECT to GBG NDB climbing to 5000′ and hold.

MSA GRZ VOR: 8200 ❶ (120°–235°), 3500 ❶ (235°–330°), 8800 ❶ (330°–120°)

Alt Set: hPa | Rwy Elev: 39 hPa | Trans level: By ATC | Trans alt: 10000′



1 in=5 NM



Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	372	478	531	637	743	849

ALSF-II
REIL
PAPI

D3.0 OEG

PANS OPS

Std/State STRAIGHT-IN LANDING

CAT IIIB ILS	CAT IIIA ILS	CAT II ILS A	CAT II ILS B	CAT II ILS C	CAT II ILS D
	DH 50′	RA 103′ DA(H) 1188′(100′)	RA 116′ DA(H) 1201′(113′)	RA 129′ DA(H) 1212′(124′)	RA 144′ DA(H) 1227′(139′)
R75m	R200m	R300m		R400m	

CHANGES: MSA, NDB withdrawn, SMA, minimums.

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SINGAPORE, SINGAPORE
ICW ILS DME Rwy 02L

D-ATIS Arrival	*SINGAPORE Approach (R)	SINGAPORE Arrival (R)	SINGAPORE Tower		*Ground
128.025	124.05	119.3	Rwy 02L/20R 118.6	Rwy 02C/20C 118.25	124.3

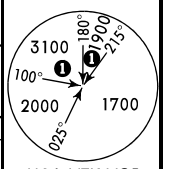
BRIEFING STRIP™

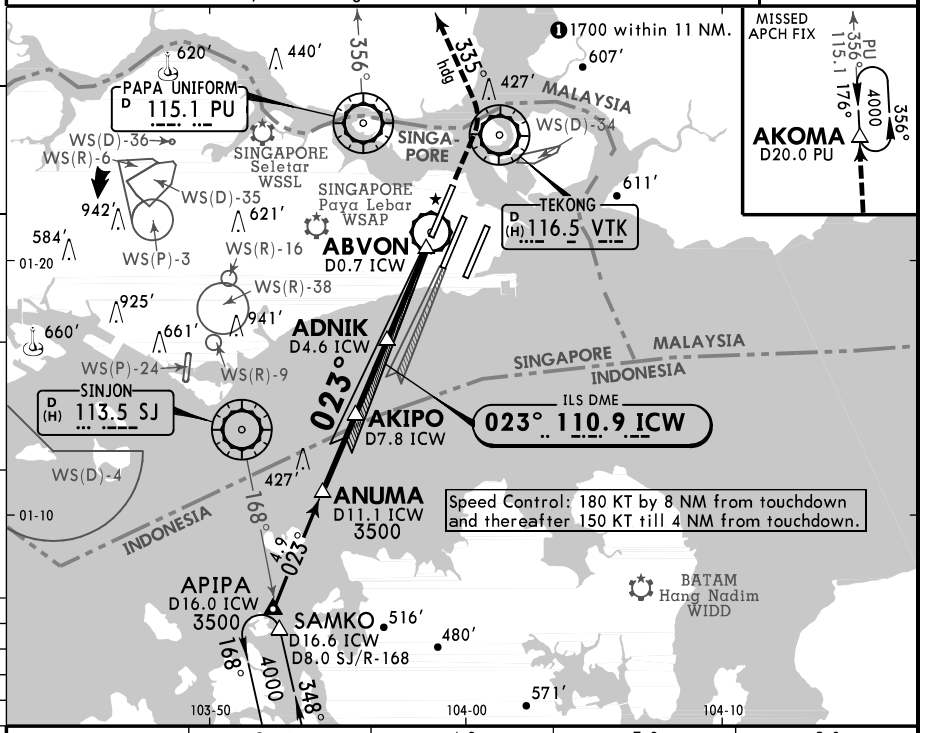
LOC ICW	Final Apch Crs	ADNIK	ILS DA(H)	Apt Elev 22'
110.9	023°	1500'(1478')	222'(200')	Rwy 22'

MISSED APCH: Climb to 1000', then climbing LEFT turn to 4000' via heading 335° and outbound PU VOR R-356 to AKOMA (PU VOR R-356/ D20.0) and hold or as directed by ATC.

Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL130 Trans alt: 11000'

1. Radar required. 2. Simultaneous approaches authorized with Rwy 02R or 02C. 3. ILS DME co-located with glideslope. 4. Maritime vessels of variable heights in water north and south of Rwy. 5. Circling not authorized.

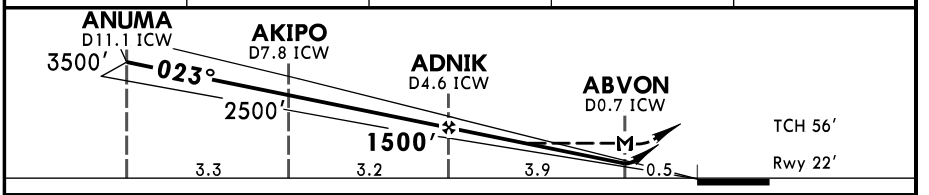




132

LOC (GS out)	ICW DME	4.0	3.0	2.0
	ALTITUDE	1290'	970'	660'

1 in=7.5 NM



Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	372	478	531	637	743	849
MAP at ABVON/D0.7 ICW							
1 FAF to MAP	3.9	3:21	2:36	2:20	1:57	1:40	1:28

ALSF-II REIL PAPI PAPI

1000' 4000' via LT 335° hdg

Std STRAIGHT-IN LANDING

ILS DA(H) 222'(200')			LOC (GS out) CDFA 2 DA/MDA(H) 420'(398')	
	TDZ or CL out	ALS out		ALS out
A	R550m	3 R550m	R1200m	R1100m	R1500m
B				
C				R1800m
D				

PANS OPS

1 Timing not authorized when GS inop. 2 VNAV DA(H) in lieu of MDA(H) depends on operator policy. 3 R750m when a Flight Director or Autopilot or HUD to DA is not used.

CHANGES: Procedure title.

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WSSS/SIN
CHANGI

JEPPESEN

2 FEB 24 (11-1A)

SINGAPORE, SINGAPORE
ICW ILS DME Rwy 02L CAT II

D-ATIS Arrival	*SINGAPORE Approach (R)	SINGAPORE Arrival (R)	SINGAPORE Tower		*Ground
128.025	124.05	119.3	Rwy 02L/20R 118.6	Rwy 02C/20C 118.25	124.3

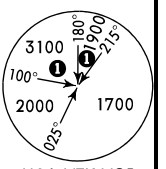
BRIEFING STRIP™

LOC ICW	Final Apch Crs	ANUMA	CAT II ILS	Apt Elev 22′
110.9	023°	3500′(3478′)	Refer to Minimums	Rwy 22′

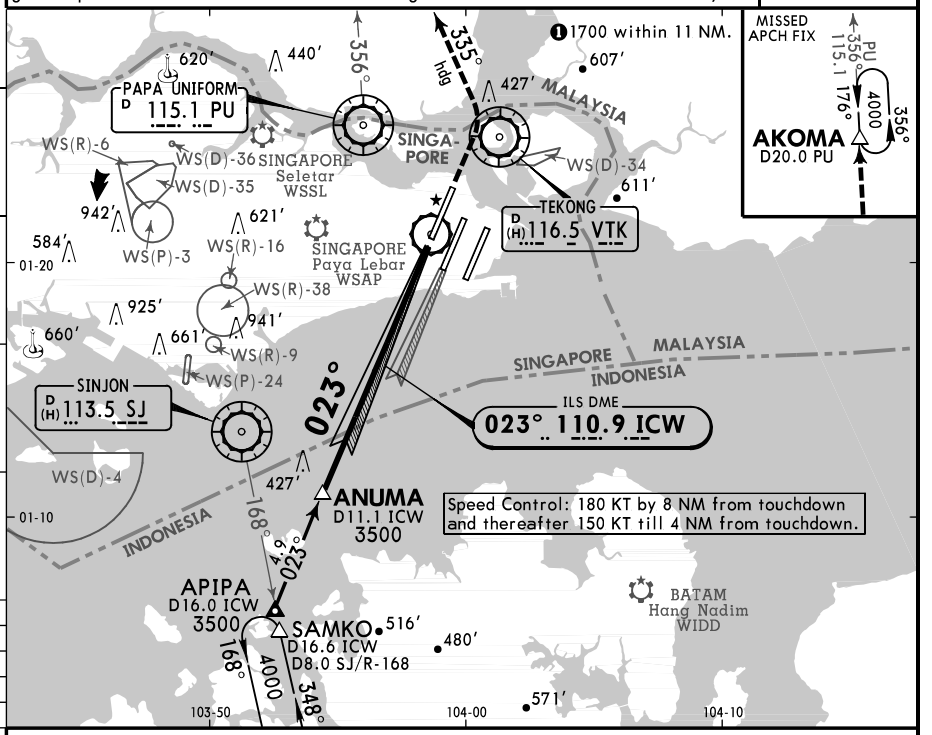
MISSED APCH: Climb to 1000′, then climbing LEFT turn to 4000′ via heading 335° and outbound PU VOR R-356 to AKOMA (PU VOR R-356/ D20.0) and hold or as directed by ATC.

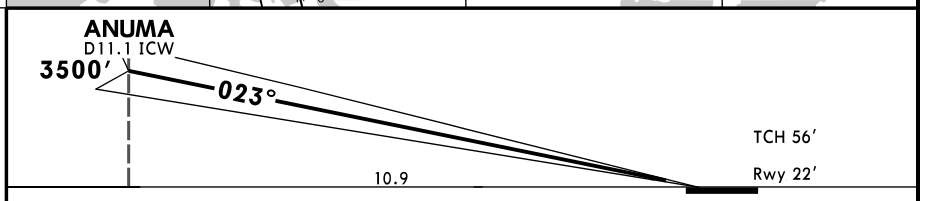
Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL130 Trans alt: 11000′

1. Special Aircrew and Acft Certificaton Required. 2. Radar requried.
3. Simultaneous approaches authorized with Rwy 02R or 02C. 4. ILS DME co-located with glideslope. 5. Maritime vessels of variable heights in water north and south of Rwy.



MSA VTK VOR





Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	372	478	531	637	743	849

ALSF-II REIL PAPI PAPI

1000′ 4000′ via LT 335° hdg

Std

STRAIGHT-IN LANDING

CAT II ILS

ABC	D
RA 104′	**RA 109′**
DA(H) **122′**(100′)	DA(H) **127′**(105′)
R350m	R350m

PANS OPS

CHANGES: Procedure title.

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D-ATIS Arrival	*SINGAPORE Approach (R)	SINGAPORE Arrival (R)	SINGAPORE Tower		*Ground
128.025	124.05	119.3	Rwy 02L/20R 118.6	Rwy 02C/20C 118.25	124.3

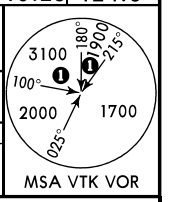
LOC ICE	Final Apch Crs	LASIN	ILS DA(H)	Apt Elev 22′
108.3	023°	1500′(1484′)	216′(200′)	Rwy 16′

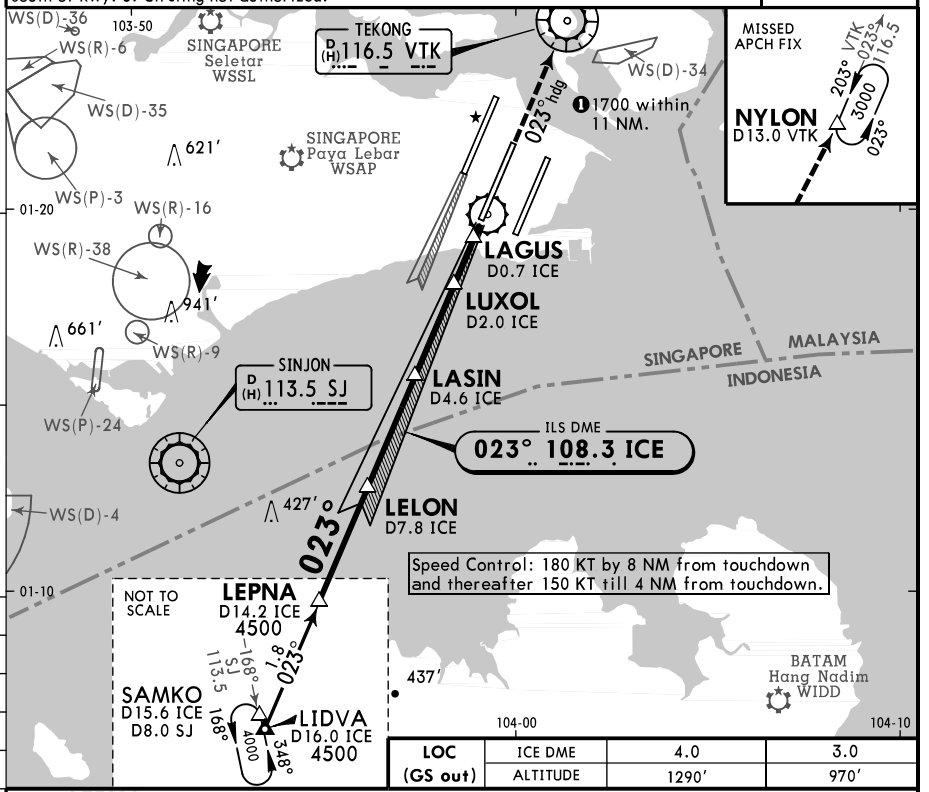
MISSED APCH: Climb to 3000′ via heading 023° and outbound VTK VOR R-023 to NYLON (VTK VOR R-023/D13.0) and hold or as directed by ATC.

Alt Set: hPa | Rwy Elev: 1 hPa | Trans level: FL130 | Trans alt: 11000′

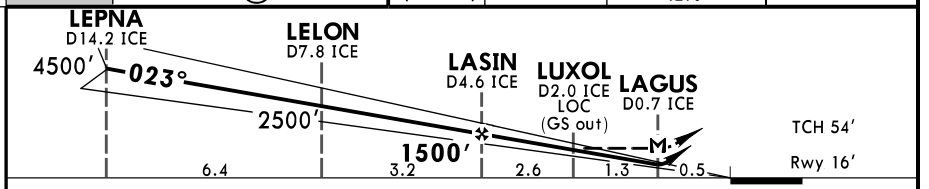
1. Radar required. 2. Simultaneous approaches authorized with Rwy 02R or 02L. 3. ILS DME co-located with glide slope. 4. Maritime vessels of variable heights in water north and south of Rwy. 5. Circling not authorized.

BRIEFING STRIP™





LOC (GS out)	ICE DME	4.0	3.0
	ALTITUDE	1290′	970′



Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	372	478	531	637	743	849
MAP at LAGUS/D0.7 ICE							
1 FAF to MAP	3.9	3:21	2:36	2:20	1:57	1:40	1:28

ALSF-I
REIL PAPI PAPI

3000′ via 023° hdg and VTK 116.5 R-023

Std STRAIGHT-IN LANDING

	ILS DA(H) 216′(200′)			CDFA 2 DA/MDA(H) 420′(404′) With LUXOL/D2.0 ICE		LOC (GS out) CDFA 2 DA/MDA(H) 660′(644′) Without LUXOL/D2.0 ICE	
		TDZ or CL out	ALS out		ALS out		ALS out
A	R550m	3 R550m	R1200m	R1200m	R1500m	R1500m	
B							
C					R1900m	R2300m	R2400m
D							

PANS OPS

1 Timing not authorized when GS inop. 2 VNAV DA(H) in lieu of MDA(H) depends on operator policy.
3 R750m when a Flight Director or Autopilot or HUD to DA is not used.

CHANGES: Procedure title.

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BRIEFING STRIP™

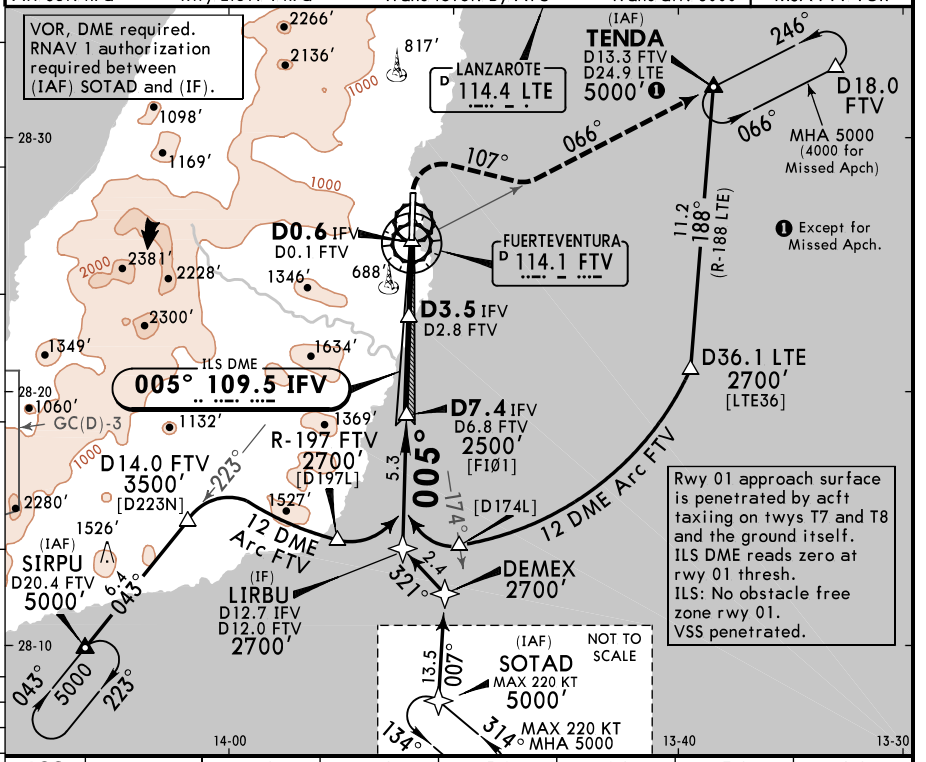
*D-ATIS	*CANARIAS Approach	*FUERTEVENTURA Tower	*Ground
118.650	129.3	118.475	121.7

LOC IFV	Final Apch Crs	D7.4 IFV	ILS DA(H) Refer to Minimums	Apt Elev 83' Rwy 37'
109.5	005°	2500'(2463')		

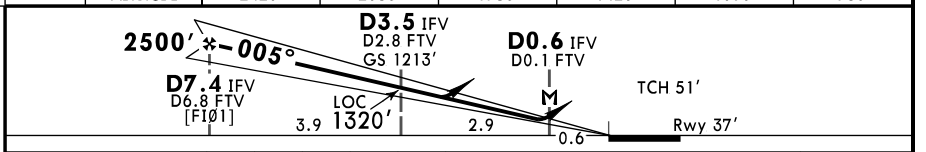
MISSED APCH: Climb on R-005 FTV to 530' (LOC: 800'), then turn RIGHT (MAX 185 KT) onto 107° to intercept and follow R-066 FTV. Proceed to TENDA climbing to 4000' and join holding.

Alt Set: hPa Rwy Elev: 1 hPa Trans level: By ATC Trans alt: 6000'

MSA FTV VOR: 4000 (203°–004°), 3100



LOC (GS out)	IFV DME	7.0	6.0	5.0	4.0	3.0	2.0
	ALTITUDE	2420'	2080'	1750'	1420'	1090'	760'



Gnd speed-Kts		70	90	100	120	140	160
ILS GS	3.00°	372	478	531	637	743	849
LOC Descent Angle	3.13°	388	498	554	665	775	886
MAP at D0.6 IFV/D0.1 FTV							

HIALS, REIL, PAPI, PAPI — Refer to Missed Apch above

Std/State — STRAIGHT-IN LANDING

ILS: DA(H) A: **272'**(235') C: **292'**(255') B: **284'**(247') D: **303'**(266')

LOC (GS out): CDFA ❷ DA/MDA(H) **620'**(583')

CIRCLE-TO-LAND: Not authorized West of airport

	FULL	ALS out		ALS out
A	❶R600m	R1200m	R1500m	
B				
C		R1300m	R2000m	R2400m
D				

Max Kts	MDA(H)	
100	1030' (947')	V1500m
135	1030' (947')	V1600m
180	1130' (1047')	V2400m
205	1400' (1317')	V3600m

PANS OPS

❶ R750m when a Flight Director or Autopilot or HUD to DA is not used.
❷ VNAV DA(H) in lieu of MDA(H) depends on operator policy.

CHANGES: TENDA DME reference added, SOTAD Holding speed, FTV DME distance. © JEPPESEN, 2004, 2022. ALL RIGHTS RESERVED.

GCFV/FUE
FUERTEVENTURA

JEPPESEN 2 SEP 22 (11-2) Eff 8 Sep

FUERTEVENTURA, CANARY IS
ILS Y or LOC Y Rwy 01

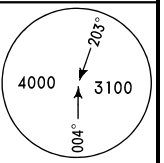
BRIEFING STRIP™

*D-ATIS	*CANARIAS Approach	*FUERTEVENTURA Tower	*Ground
118.650	129.3	118.475	121.7

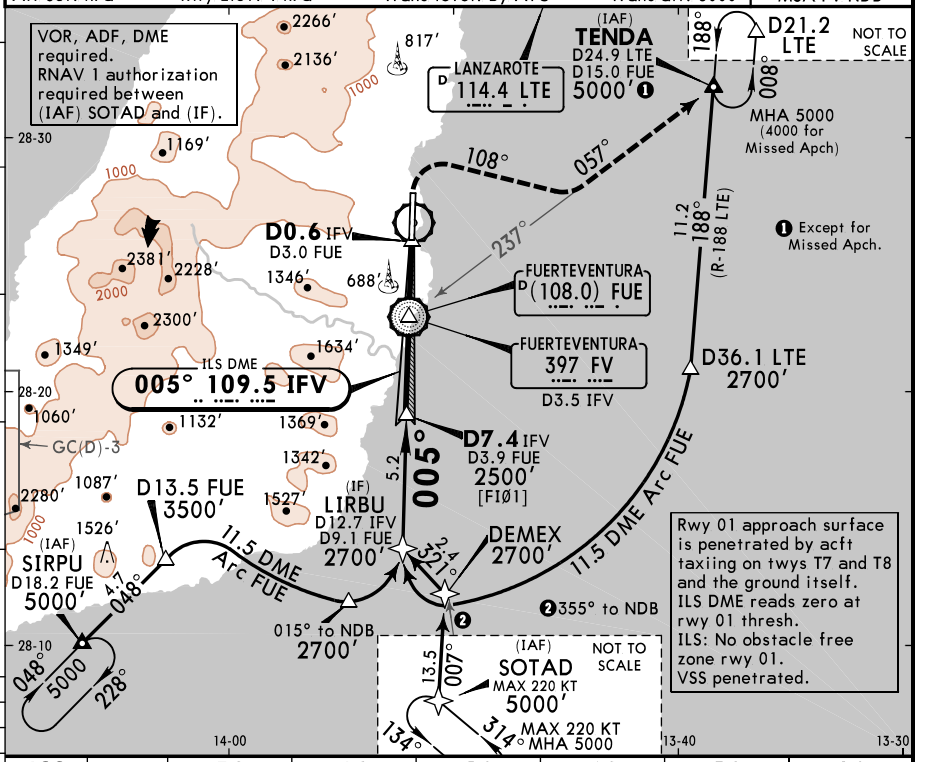
LOC IFV	Final Apch Crs	D7.4 IFV	ILS DA(H) Refer to Minimums	Apt Elev 83' Rwy 37'
109.5	005°	2500'(2463')		

MISSED APCH: Climb on rwy heading to 530' (LOC: 800'), then turn RIGHT (MAX 185 KT) onto 108°. Intercept and proceed on 057° from NDB to TENDA climbing to 4000' and join holding.

Alt Set: hPa Rwy Elev: 1 hPa Trans level: By ATC Trans alt: 6000'

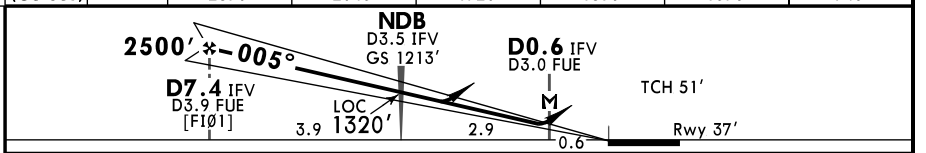


MSA FV NDB



LOC (GS out)	IFV DME	7.0	6.0	5.0	4.0	3.0	2.0
	ALTITUDE	2370'	2040'	1720'	1390'	1070'	740'

1 in=7.5 NM



Gnd speed-Kts		70	90	100	120	140	160
ILS GS	3.00°	372	478	531	637	743	849
LOC Descent Angle	3.06°	379	487	541	650	758	866
MAP at D0.6 IFV/3.0 FUE							

HIALS, REIL, PAPI, PAPI — Refer to Missed Apch above

Std/State — STRAIGHT-IN LANDING

ILS: DA(H) A: **272'**(235') C: **292'**(255') B: **284'**(247') D: **303'**(266')

LOC (GS out): CDFA [2] DA/MDA(H) **620'**(583')

CIRCLE-TO-LAND: Not authorized West of airport

	FULL	ALS out		ALS out
A	[1] R600m	R1200m	R1500m	
B				
C		R1300m	R2000m	R2400m
D				

Max Kts	MDA(H)	
100	1030' (947')	V1500m
135	1030' (947')	V1600m
180	1130' (1047')	V2400m
205	1400' (1317')	V3600m

PANS OPS

[1] R750m when a Flight Director or Autopilot or HUD to DA is not used.
[2] VNAV DA(H) in lieu of MDA(H) depends on operator policy.

CHANGES: TENDA DME reference added, Holding speed, GS crossing altitude.

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ATIS	ALMATY Approach	ALMATY Radar	ALMATY Tower	Ground
129.8 (Russian 135.1)	124.8	126.8	119.4	121.7

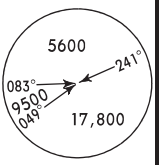
BRIEFING STRIP™

LOC IMA	Final Apch Crs	LIKRU	DA/MDA(H)	Apt Elev 2238′
109.1	051°	4200′(1979′)	2830′(609′)	Rwy 2221′

MISSED APCH: Climb on track 051° to 5200′. After passing 3200′ radar vectoring will be provided.
MISSED APCH WITH COMM FAILURE: Climb on track 051° to 5200′, turn LEFT to VOR, but not earlier than D6.5 ATA. Climb to 10000′(not below) to VOR and join holding.

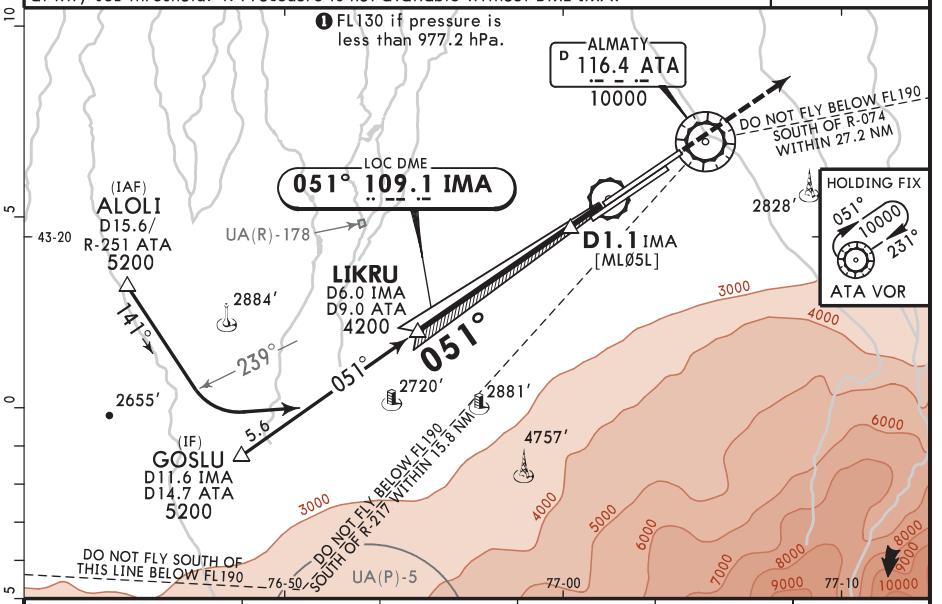
Alt Set: hPa (MM on req) Rwy Elev: 79 hPa Trans level: FL120 ❶ Trans alt: 10000′

1. Radar required. 2. WARNING: Radio interference may arise during ILS and VOR approaches of ACFT equipped with ILS and VOR receivers, which do not meet the requirement on protection against FM broadcasting stations. 3. ILS DME reads zero at Rwy 05L threshold. 4. Procedure is not available without DME IMA.

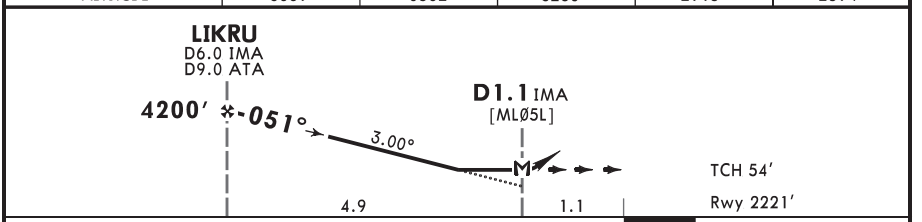


MSA ATA VOR

135



DIST to THR/IMA DME	5.0	4.0	3.0	2.0	1.0
ATA DME	8.0	7.0	6.0	5.0	4.0
ALTITUDE	3889′	3562′	3238′	2915′	2594′



Gnd speed-Kts		70	90	100	120	140	160
Descent Angle	3.00°	372	478	531	637	743	849
MAP at D1.1 IMA							
LIKRU to MAP	4.9	4:12	3:16	2:56	2:27	2:06	1:50

HIALS
PAPI

5200′ on 051°

Std STRAIGHT-IN LANDING
CDFA
❶ DA/MDA(H) **2830′**(609′)

ALS out

PANS OPS

A	R1500m	
B		
C	R2100m	R2400m
D		

❶ VNAV DA(H) in lieu of MDA(H) depends on operator policy.

CHANGES: DA/MDA(H), minimums.

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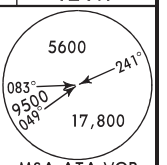
ALMATY, KAZAKHSTAN
ILS DME Rwy 05R

BRIEFING STRIP™

ATIS	ALMATY Approach	ALMATY Radar	ALMATY Tower	Ground
129.8 (Russian 135.1)	124.8	126.8	119.4	121.7

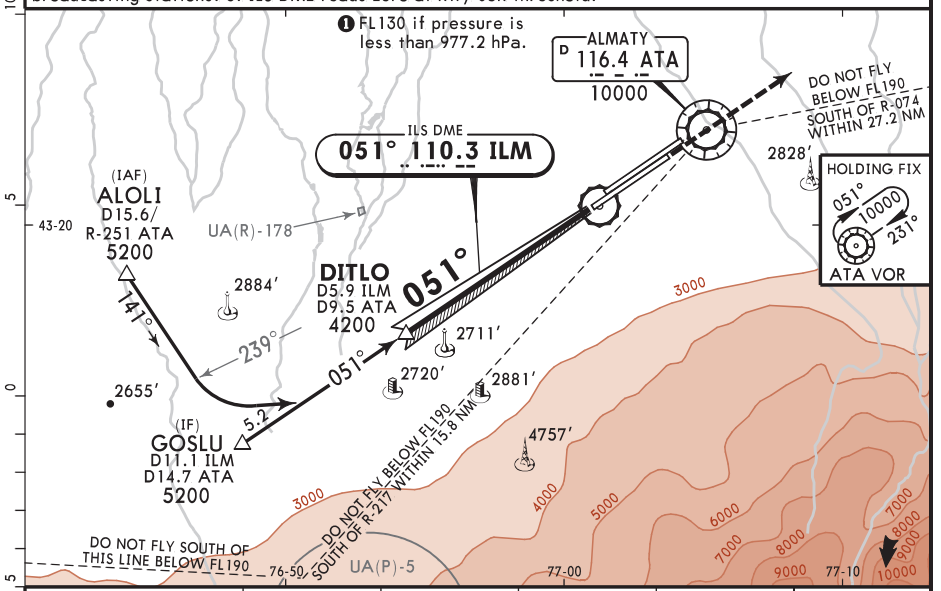
LOC ILM	Final Apch Crs	DITLO	DA(H)	Apt Elev 2238′ Rwy 2228′
110.3	051°	4200′(1972′)	2428′(200′)	



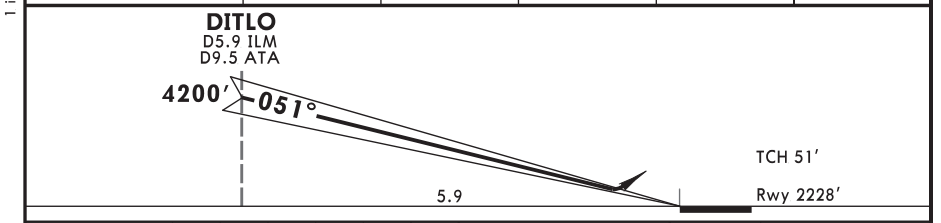
MISSED APCH: Climb on track 051° to 5200′. After passing 3200′ radar vectoring will be provided.
MISSED APCH WITH COMM FAILURE: Climb on track 051° to 5200′, turn LEFT to VOR, but not earlier than D6.5 ATA. Climb to 10000′(not below) to VOR and join holding.

Alt Set: hPa (MM on req) Rwy Elev: 79 hPa Trans level: FL120❶ Trans alt: 10000′

1. Radar required. 2. WARNING: Radio interference may arise during ILS and VOR approaches of ACFT equipped with ILS and VOR receivers, which do not meet the requirement on protection against FM broadcasting stations. 3. ILS DME reads zero at Rwy 05R threshold.



DIST to THR/ILM DME	5.0	4.0	3.0	2.0	1.0
ATA DME	8.6	7.6	6.6	5.6	4.6
ALTITUDE	3893′	3566′	3242′	2919′	2598′



Gnd speed-Kts	70	90	100	120	140	160
GS 3.00°	372	478	531	637	743	849

HIALS
PAPI
5200′ on 051°

Std STRAIGHT-IN LANDING
ILS
DA(H) **2428′**(200′)

PANS OPS

		ALS out
A	❶ R550m	R1200m
B		
C		
D		

❶ R750m when a Flight Director or Autopilot or HUD to DA is not used.

CHANGES: None.

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COPTER ILS or LOC Rwy 13

D-ATIS Arrival	NEW YORK Approach (R)	LAGUARDIA Tower	Ground
125.95	120.8	118.7	121.7

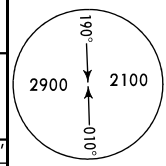
LOC IGDI	Final Apch Crs	HULBI	ILS DA(H)	Apt Elev 21′
108.5	134°	1400′(1388′)	212′(200′)	TDZE 12′

BRIEFING STRIP™

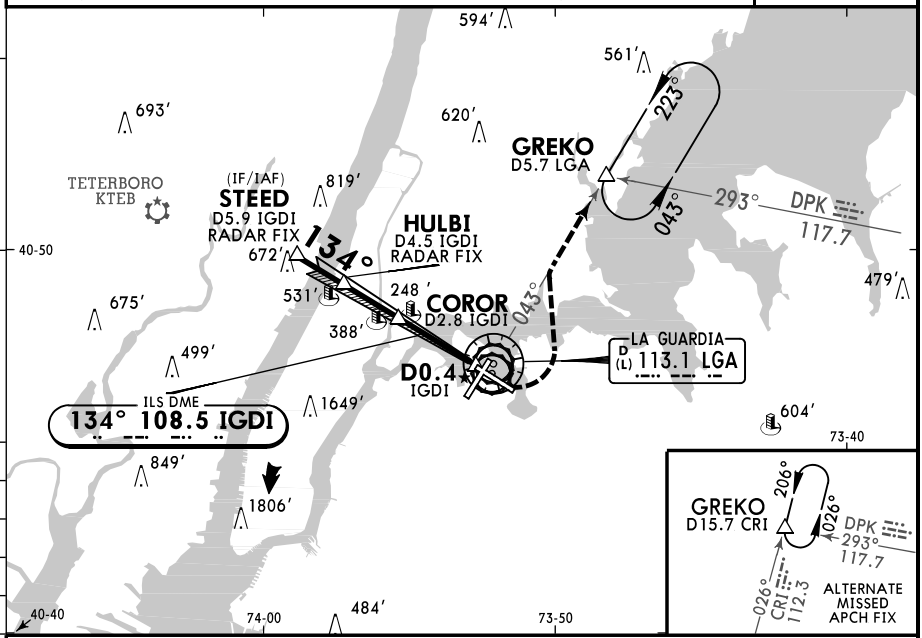
MISSED APCH: Climb to 800′ then climbing LEFT turn to 2000′ outbound on LGA VOR R-043 to GREKO INT/D5.7 LGA and hold, continue climb-in-hold to 2000′.

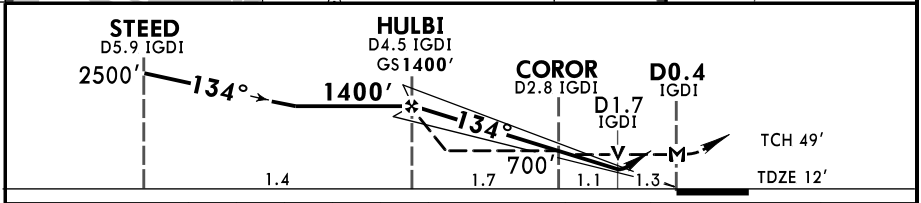
Alt Set: INCHES | Trans level: FL 180 | Trans alt: 18000′

1. Radar required for procedure entry. 2. DME or Radar required. 3. VGSI and ILS glidepath not coincident (VGSI angle 3.10°/TCH 55′). 4. Limit intermediate approach to 90 KT. 5. Limit final and missed approach to 70 KT. 6. Increase to 90 KT upon reaching the missed approach altitude. 7. Intermediate descent gradient is 765′/NM.



MSA LGA VOR





Gnd speed-Kts		70	90	100	120	140	160
GS	3.10°	384	494	548	658	768	878
MAP at D0.4 IGDI or HULBI to MAP	4.1	3:31	2:44	2:28	2:03	1:45	1:32

MALSR
PAPI

800′

2000′ LT on LGA 113.1 R-043

GREKO

STRAIGHT-IN LANDING RWY 13

	ILS DA(H) 212′(200′)		LOC (GS out) MDA(H) 500′(488′) With COROR		MDA(H) 700′(688′) Without COROR	
	FULL	RAIL/ALS out		RAIL/ALS out		RAIL/ALS out
COPTER	RVR 12 or 1/4	RVR 24 or 1/2	RVR 12 or 1/4	RVR 40 or 3/4	RVR 12 or 1/4	RVR 40 or 3/4

TERPS AMEND 1 17 JUN 2021

CHANGES: Procedure.

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COPTER ILS or LOC Rwy 22

BRIEFING STRIP™

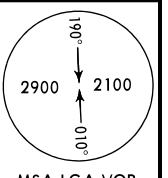
D-ATIS Arrival	NEW YORK Approach (R)	LAGUARDIA Tower	Ground
125.95	120.8	118.7	121.7

LOC IURD	Final Apch Crs	ALEKS	ILS DA(H)	Apt Elev 21′
110.5	224°	1100′(1088′)	212′(200′)	TDZE 12′

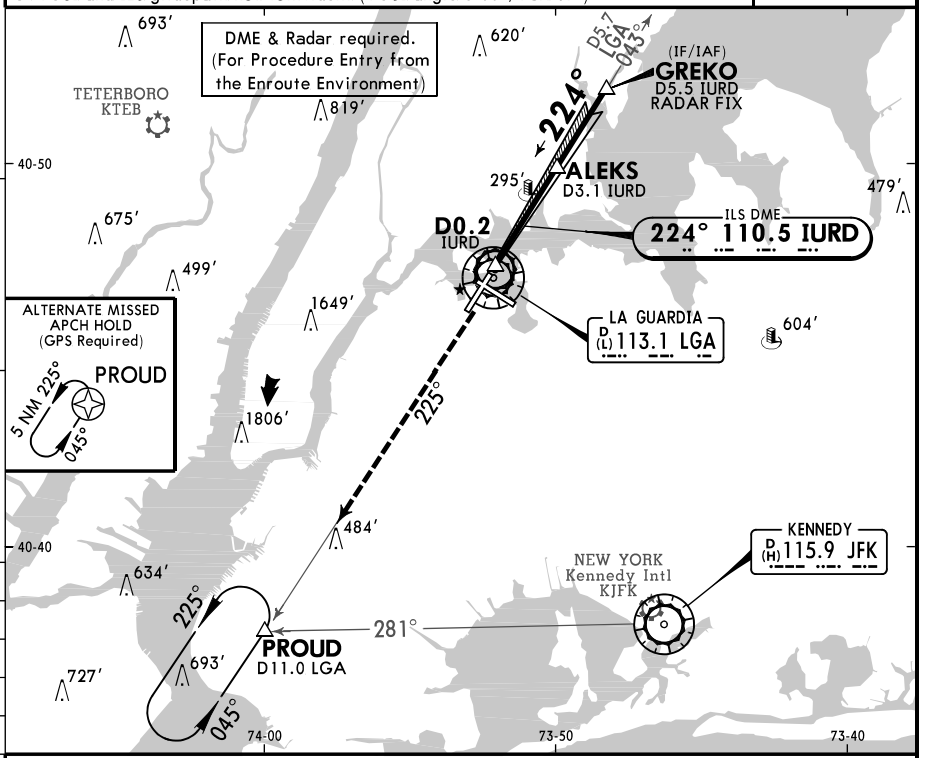
MISSED APCH: Climb to 3000′ outbound on LGA VOR R-225 to PROUD INT/D11.0 LGA and hold.

Alt Set: INCHES — Trans level: FL 180 — Trans alt: 18000′

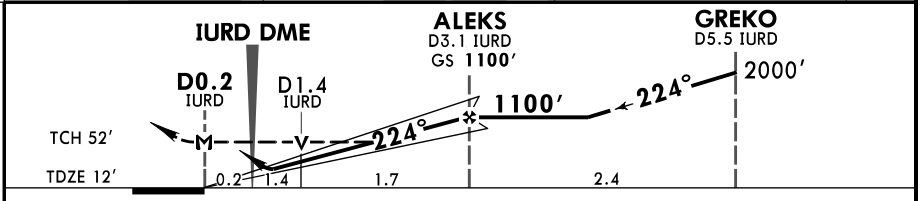
1. DME required. 2. Limit intermediate approach to 90 KT. 3. Limit final and missed approach to 70 KT. 4. Increase to 90 KT upon reaching the missed approach altitude. 5. VGSI and ILS glidepath not coincident (VGSI angle 3.00°/TCH 67′).



MSA LGA VOR



1 in=5 NM



Gnd speed-Kts	70	90	100	120	140	160
GS 3.00°	372	478	531	637	743	849
MAP at D0.2 IURD						
ALEKS to MAP 3.3	2:50	2:12	1:59	1:39	1:25	1:14

ALSF-I
PAPI

3000′ on LGA 113.1 R-225 PROUD

STRAIGHT-IN LANDING RWY 22

	ILS DA(H) 212′(200′)		LOC (GS out) MDA(H) 560′(548′)	
	FULL / TDZ/CL out	ALS out		ALS out
COPTER	RVR 12 or 1/4	RVR 24 or 1/2	RVR 12 or 1/4	RVR 40 or 3/4

TERPS AMEND 3 7 DEC 2017

CHANGES: REIL deleted, minimums, chart format.

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KMFR/MFR
ROGUE VALLEY INTL-MEDFORD

JEPPESEN

1 OCT 21 (11-1)

MEDFORD, OREG
ILS or LOC Rwy 14

ATIS (ASOS when Twr inop)	*CASCADE Approach (R)	SEATTLE Center (R)	*MEDFORD Tower	*Ground
127.25	124.3	124.85 when App inop.	CTAF 119.4	121.8

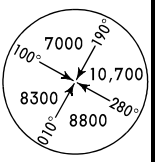
LOC IMFR	Final Apch Crs	OSSAJ	ILS DA(H) (CONDITIONAL)	Apt Elev 1335'
110.3	143°	3900'(2597')	1503'(200')	TDZE 1303'

BRIEFING STRIP™

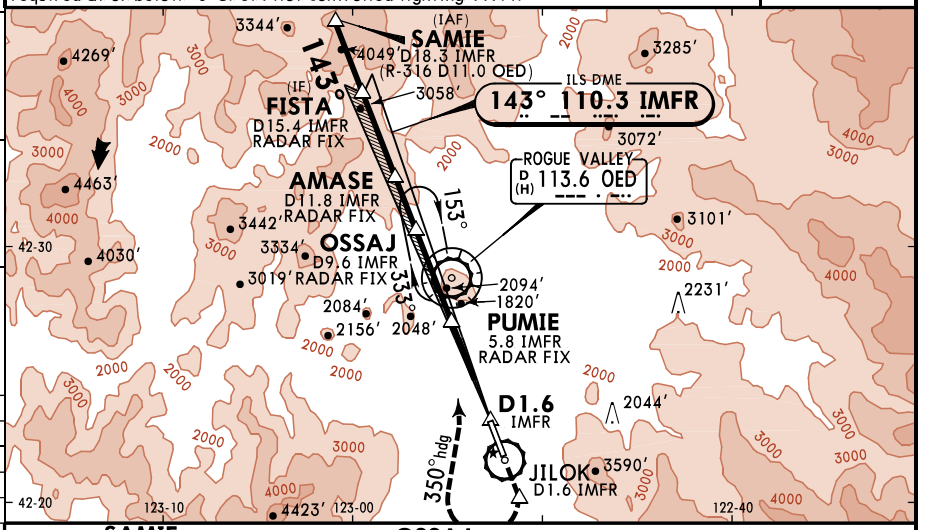
MISSED APCH: Climb to 6600' on IMFR SE course to JILOK/D1.6 IMFR and climbing RIGHT turn on heading 350° and on OED VOR R-160 to OED VOR and hold, continue climb-in-hold to 6600'.

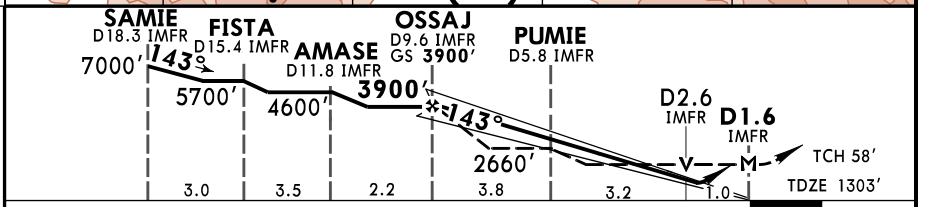
Alt Set: INCHES — Trans level: FL 180 — Trans alt: 18000'

1. DME required. 2. DME or RADAR required for procedure entry. 3. When Medford altimeter not received, procedure not authorized. 4. VGSI and ILS glidepath not coincident (VGSI angle 3.00°/TCH 73'). 5. Cold temperature altitude correction required at or below -3°C. 6. Pilot controlled lighting 119.4.



MSA OED VOR





Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	372	478	531	637	743	849
MAP at D1.6 IMFR							

MALSR — PAPI — 6600' on IMFR SE course — JILOK

TERPS

STRAIGHT-IN LANDING RWY 14

Missed approach requires a minimum climb gradient of 331'/NM to 4100'

	ILS DA(H) 1503'(200') FULL	TDZ/CL out	RAIL/ALS out	LOC (GS out) MDA(H) 1680'(377')	RAIL/ALS out
A	RVR 18 or ½	[1] RVR 24 or ½	RVR 40 or ¾	RVR 24 or ½	RVR 50 or 1
B					
C				RVR 35 or ⅝	RVR 55 or 1
D					

STRAIGHT-IN LANDING RWY 14

	ILS DA(H) 1929'(626') FULL	RAIL/ALS out	LOC (GS out) MDA(H) 2080'(777')	RAIL/ALS out
A	1⅜	1¾	RVR 24 or ½	RVR 50 or 1
B			RVR 40 or ¾	RVR 60 or 1¼
C			1¾	2½
D				

CIRCLE-TO-LAND

Max Kts.	MDA(H)
90	2080'(745')-1
120	2080'(745')-1¼
140	[2] 2080'(745')-2½
165	[2] 2340'(1005')-3

[1] RVR 18 with Flight Director or Autopilot or HUD to DA. [2] Circling not authorized northeast of Rwy 14-32.

TERPS AMEND 3 28 FEB 2019

CHANGES: Comms.

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KMFR/MFR
ROGUE VALLEY INTL-MEDFORD

JEPPESEN 1 OCT 21 (11-2)

MEDFORD, OREG
LOC DME (BACK CRS)-B

BRIEFING STRIP™

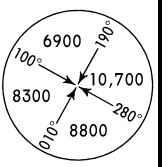
ATIS (ASOS when Twr inop)	*CASCADE Approach (R)	SEATTLE Center (R)	*MEDFORD Tower	*Ground
127.25	124.3	124.85 when App inop.	CTAF 119.4	121.8

LOC IMFR	Final Apch Crs	HOXOR	MDA(H)	Apt Elev 1335'
110.3	323° (Front Crs 143°)	7200'(5865')	Refer to Minimums	

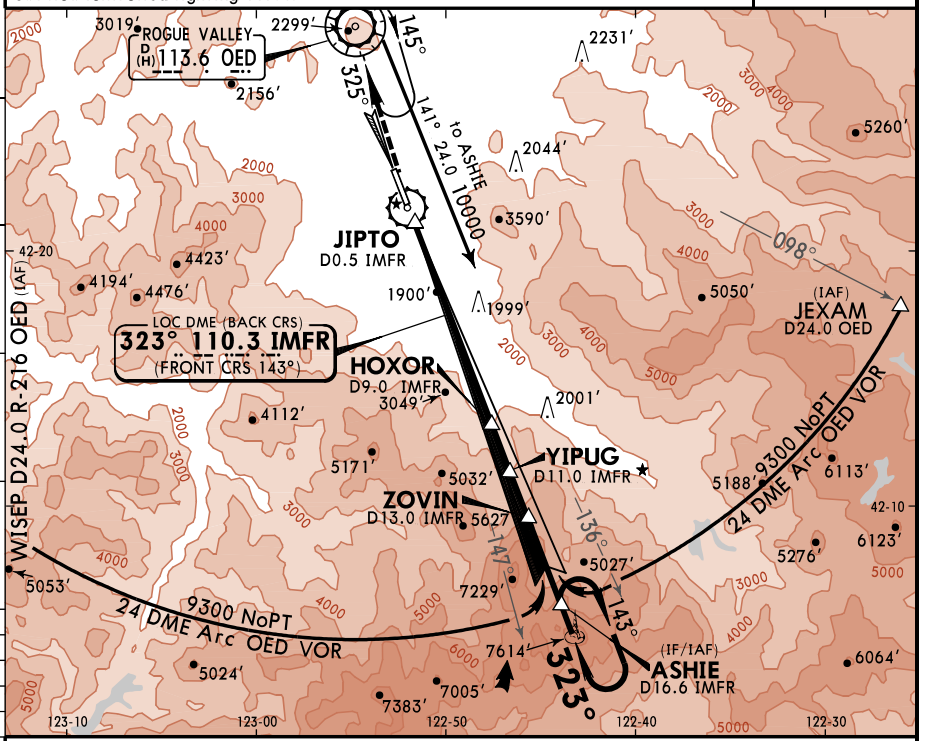
MISSED APCH: Climb to 7600' direct OED VOR and hold. Continue climb-in-hold to 7600'.

Alt Set: INCHES — Trans level: FL 180 — Trans alt: 18000'

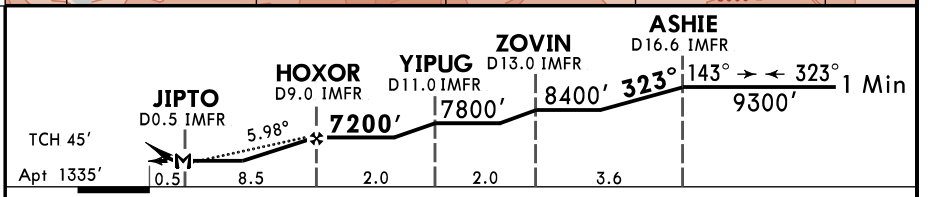
1. Use IMFR DME when on the localizer course. 2. Disregard glide slope indications. 3. VGSI and descent angles not coincident. 4. Visibility reduction by helicopters not authorized. 5. Cold temperature altitude correction required at or below -3°C. 6. Pilot controlled lighting 119.4.



MSA OED VOR



1 in=7.5 NM



Gnd speed-Kts	70	90	100	120	140	160
Descent Angle 5.98°	743	955	1061	1273	1485	1697
MAP at JIPTO						

Lighting - Refer to Airport Chart | 7600' | D | OED 113.6

CIRCLE-TO-LAND

	Max Kts.	MDA(H)
A	90	3540'(2205') - 1¼
B	120	3540'(2205') - 1½
C	140	1 3540'(2205') -3
D	165	

1 Circling not authorized northeast of Rwy 14-32.

TERPS AMEND 7A 18 NOV 2010

CHANGES: Minimums notes, comms.

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KMFR/MFR
ROGUE VALLEY INTL-MEDFORD

JEPPESEN 1 OCT 21 (12-1)

MEDFORD, OREG
RNAV (GPS) Y Rwy 14

BRIEFING STRIP™

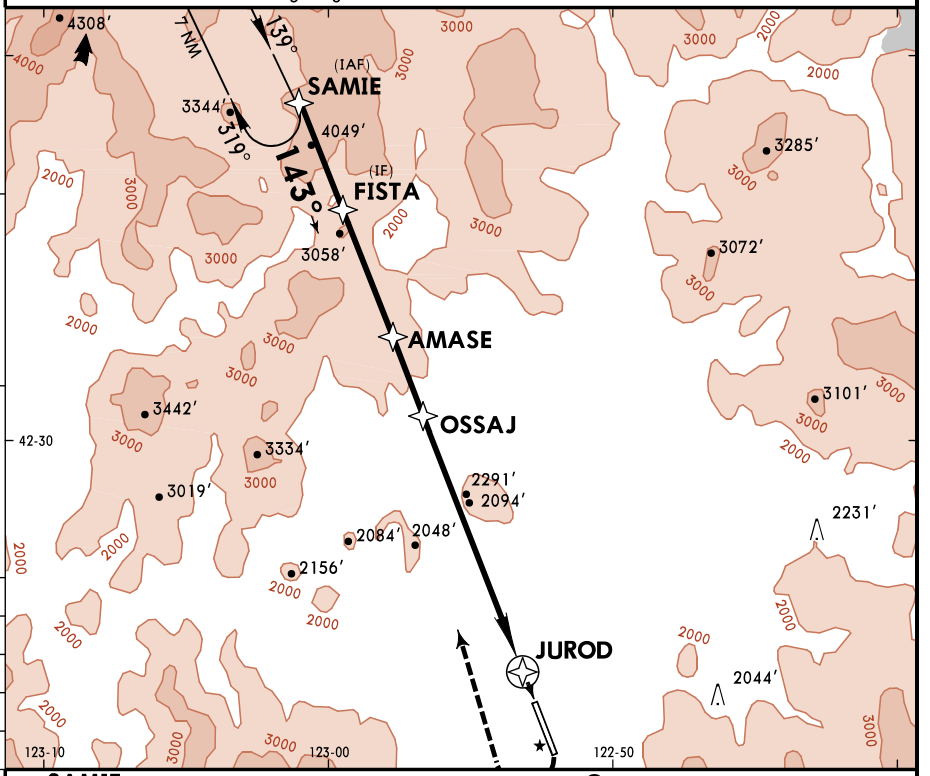
ATIS (ASOS when Twr inop)	*CASCADE Approach (R)	SEATTLE Center (R)	*MEDFORD Tower	*Ground
127.25	124.3	124.85 when App inop.	CTAF 119.4	121.8

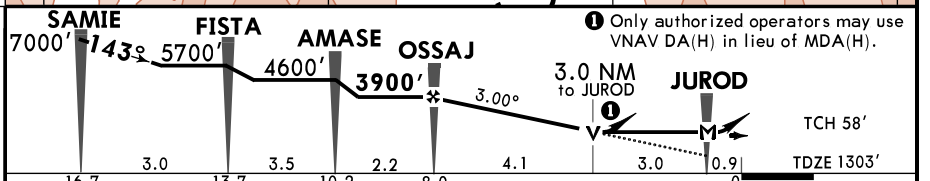
RNAV	Final Apch Crs	OSSAJ	LNAV MDA(H) (CONDITIONAL)	Apt Elev 1335′ / TDZE 1303′	10,700
	143°	3900′(2597′)	2600′(1297′)		MSA JUROD

MISSED APCH: Climbing RIGHT turn 7000′ direct SAMIE and hold, continue climb-in-hold to 7000′.

RNP Apch | Alt Set: INCHES | Trans level: FL 180 | Trans alt: 18000′

1. When Medford altimeter setting not received, procedure not authorized. 2. VGSI and descent angles not coincident (VGSI angle 3.00°/TCH 73′). 3. Cold temperature altitude correction required at or below -3°C. 4. Pilot controlled lighting 119.4.





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

1 in=5 NM

Gnd speed-Kts	70	90	100	120	140	160
Descent Angle 3.00°	372	478	531	637	743	849
MAP at JUROD						

MALSR PAPI 7000′ RT SAMIE

TERPS STRAIGHT-IN LANDING RWY 14

Missed approach requires a minimum climb gradient of 334′/NM to 4800′

	LNAV	
MDA(H)	2600′(1297′)	MDA(H) A,B: 2600′(1297′) C: 3320′(2017′) D: 3460′(2157′)
	RAIL/ALS out	RAIL/ALS out
A	RVR 40 or ¾	1¼
B	RVR 55 or 1	1½
C	3	3
D		

TERPS AMEND 2A 28 FEB 2019

CHANGES: Comms.

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KMFR/MFR
ROGUE VALLEY INTL-MEDFORD

JEPPESEN

1 OCT 21 (12-2)

MEDFORD, OREG
RNAV (GPS)-D

BRIEFING STRIP™

ATIS (ASOS when Twr inop)	*CASCADE Approach (R)	SEATTLE Center (R)	*MEDFORD Tower	*Ground
127.25	124.3	124.85 when App inop.	CTAF 119.4	121.8

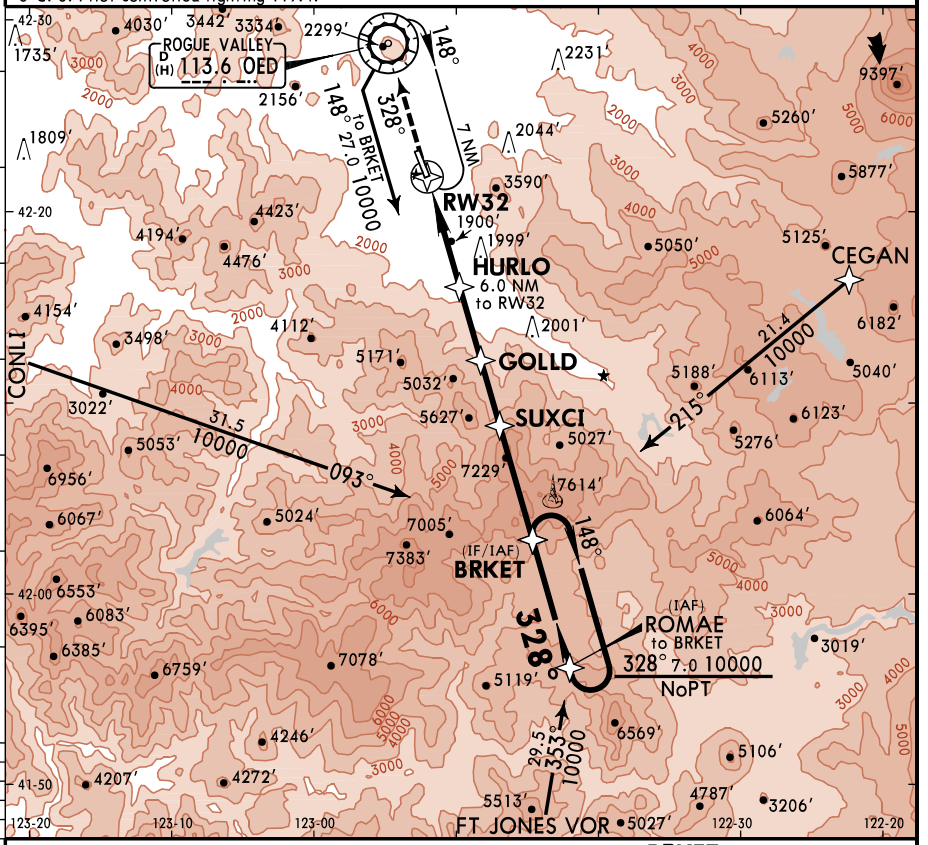
RNAV	Final Apch Crs	GOLLD	MDA(H) Refer to Minimums	Apt Elev 1335′	10,700
	328°	7400′(6065′)			MSA RW32

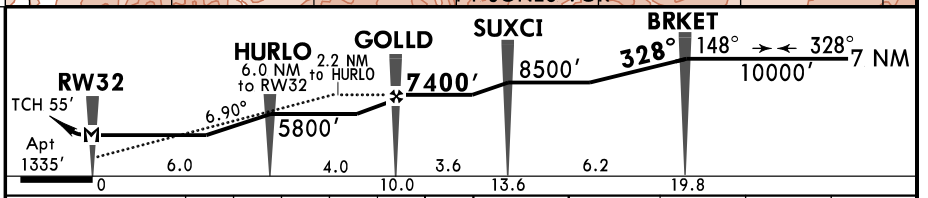
MISSED APCH: Climb to 7800′ direct OED VOR and hold. Continue climb-in-hold to 7800′.

Alt Set: INCHES — Trans level: FL 180 — Trans alt: 18000′

RNP Apch

1. VGSI and descent angles not coincident. 2. Cold temperature altitude correction required at or below -3°C. 3. Pilot controlled lighting 119.4.





Gnd speed-Kts	70	90	100	120	140	160
Descent Angle 6.90°	858	1103	1225	1471	1716	1961
MAP at RW32						

Lighting - Refer to Airport Chart

7800′

OED 113.6

TERPS AMEND 1B 18 NOV 2010

CIRCLE-TO-LAND

	Max Kts	MDA(H)
A	90	3600′(2265′) -1¼
B	120	3600′(2265′) -1½
C	140	[1]3600′(2265′) -3
D	165	

[1] Circling not authorized northeast of Rwy 14-32.

CHANGES: Minimums note, comms.

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KMFR/MFR ROGUE VALLEY INTL-MEDFORD

JEPPESEN 9 JUN 23 Eff 15 Jun (12-3) CAT A

MEDFORD, OREG RNAV (GPS) Y Rwy 32

BRIEFING STRIP™

ATIS (ASOS when Twr inop)	*CASCADE Approach (R)	SEATTLE Center (R)	*MEDFORD Tower	*Ground
127.25	124.3	124.85 when App inop.	CTAF 119.4	121.8

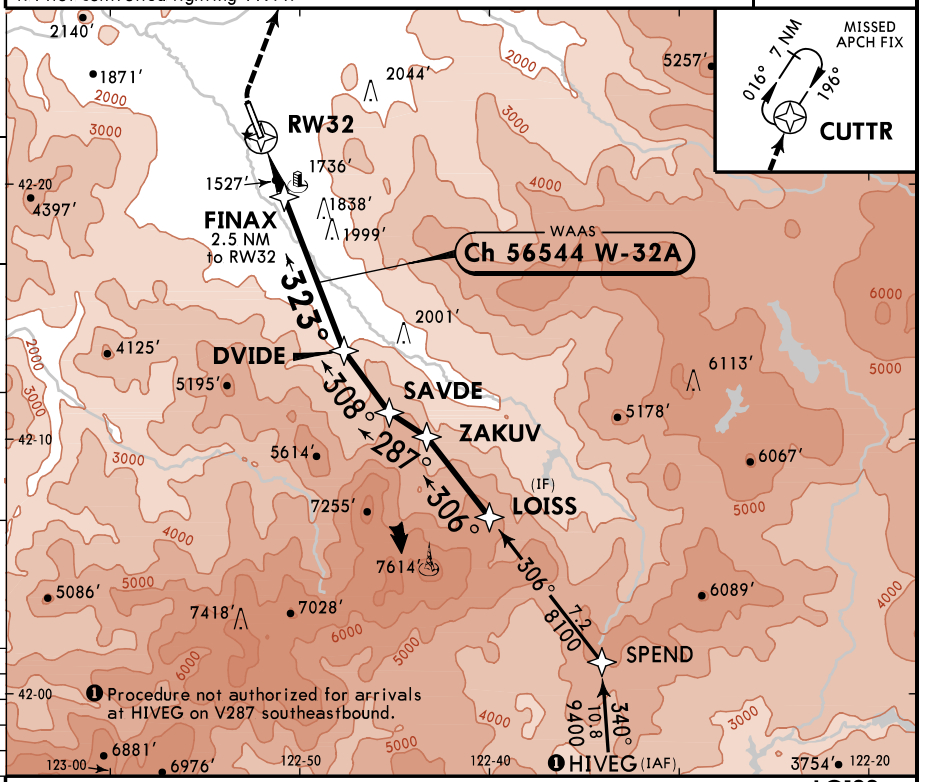
WAAS	Final Apch Crs	DVIDE	LPV DA(H)	Apt Elev 1335′
Ch 56544 W-32A	323°	6100′(4765′)	1610′(275′)	TDZE 1335′

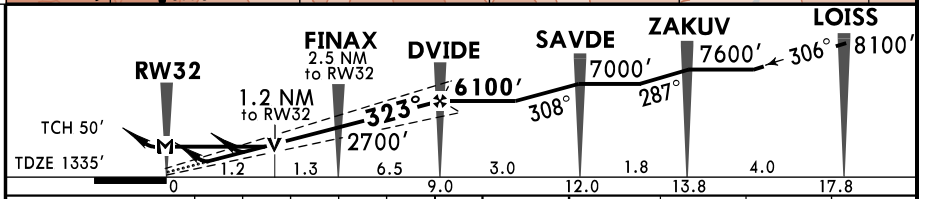
10,400 MSA RW32

MISSED APCH: Climb to 1900′ then climbing RIGHT turn to 10500′ direct CUTTR and hold, continue climb-in-hold to 10500′.

RNP Apch - GPS | Alt Set: INCHES | Trans level: FL 180 | Trans alt: 18000′

1. Baro-VNAV not authorized. 2. VGSI and RNAV glidepath not coincident (VGSI angle 3.00°/TCH 50′). 3. Cold temperature altitude correction required at or below -3°C. 4. Pilot controlled lighting 119.4.





Gnd speed-Kts	70	90	100	120	140	160
Glide Path Angle 4.95°	614	789	877	1052	1228	1403
MAP at RW32						

REIL PAPI-R | 1900′ | 10500′ RT | CUTTR

TERPS STRAIGHT-IN LANDING RWY 32

	LPV DA(H) 1610′(275′)	LNAV/VNAV DA(H) 1768′(433′)	LNAV MDA(H) 1780′(445′)
A	7/8	1¼	1
B	NA	NA	NA
C			
D			

CIRCLE-TO-LAND

Max Kts	MDA(H)
90	2000′(665′) - 1
B	NA
C	
D	

TERPS ORIG 15 JUN 2023

CHANGES: New procedure.

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OBBI/BAH
BAHRAIN INTL

JEPPESEN

10 MAR 23 (12-1) Eff 23 Mar

BAHRAIN, BAHRAIN
RNP Rwy 12L

BRIEFING STRIP™

D-ATIS	BAHRAIN Approach (R)		BAHRAIN Tower	Ground
127.2	127.85	119.1	118.5	121.85

RNAV	Final Apch Crs	BI5Ø1	LNAV/VNAV DA(H)	Apt Elev 8′
	120°	1400′(1392′)	340′(332′)	Rwy 8′

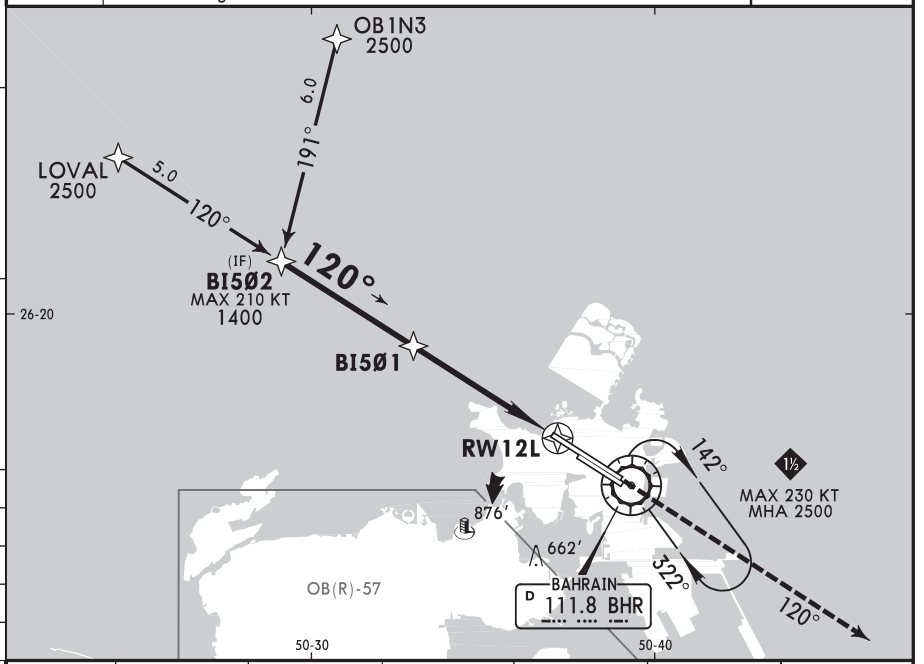
MISSED APCH: Climb on track 120° to 2500′ and contact ATC.

2000

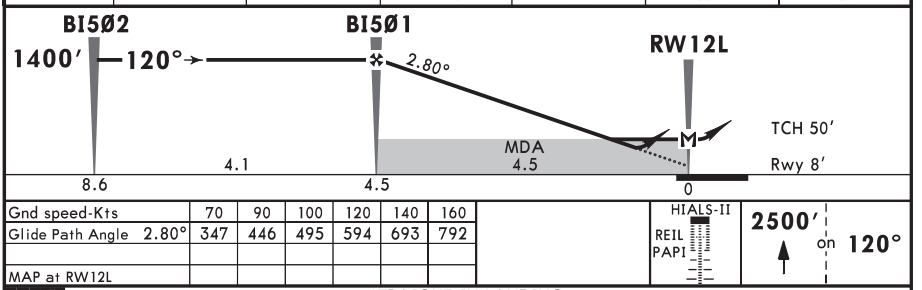
MSA ARP

Alt Set: hPa Rwy Elev: 0 hPa Trans level: FL150 Trans alt: 13000′

RNP Apch
1. Baro-VNAV not authorized below 0°C. VPA exceed 3.5° above 56°C.
2. No circling authorized between R-180 and R-260 clockwise.



DIST to RW12L	6.0	5.0	4.0	3.0	2.0	1.0
ALTITUDE	1840′	1540′	1245′	950′	650′	355′



Gnd speed-Kts	70	90	100	120	140	160
Glide Path Angle 2.80°	347	446	495	594	693	792
MAP at RW12L						

HIALS-II
REIL
PAPI

2500′ on 120°

Std STRAIGHT-IN LANDING

	LNAV/VNAV DA(H) 340′(332′)		LNAV CDFA [1] DA/MDA(H) 430′(422′)	
		ALS out		ALS out
A	R800m	R1500m	R1300m	R1500m
B				
C				R2000m
D				

PANS OPS

[1] VNAV DA(H) in lieu of MDA(H) depends on operator policy.

CHANGES: Procedure title, RNP note added.

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BRIEFING STRIP™

D-ATIS	BAHRAIN Approach (R)		BAHRAIN Tower	Ground
127.2	127.85	119.1	118.5	121.85

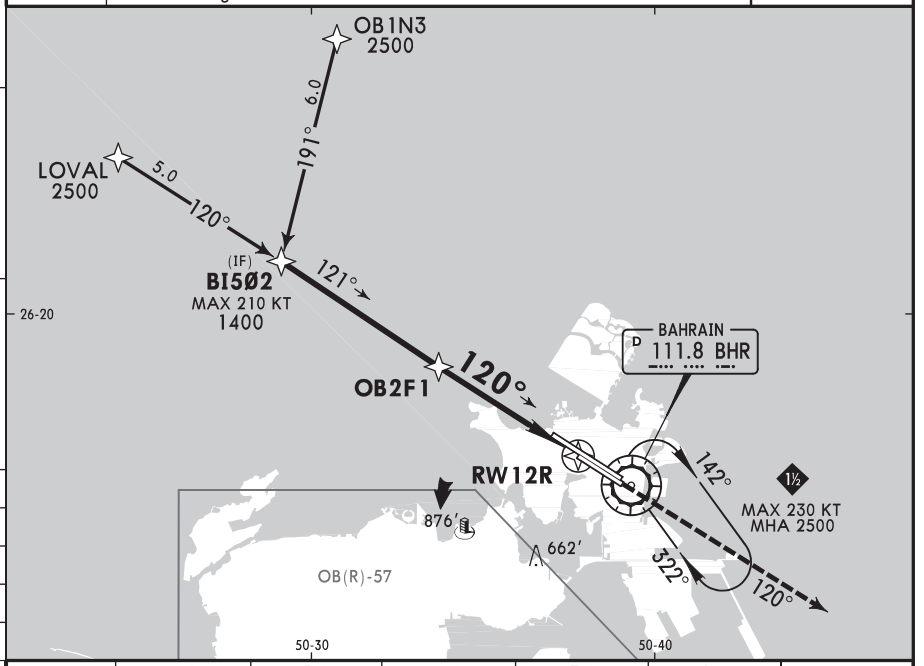
RNAV	Final Apch Crs	OB2F1	LNAV/VNAV DA(H)	Apt Elev 8′
	120°	1400′(1392′)	340′(332′)	Rwy 8′

MISSED APCH: Climb on track 120° to 2500′ and contact ATC.

2000
MSA ARP

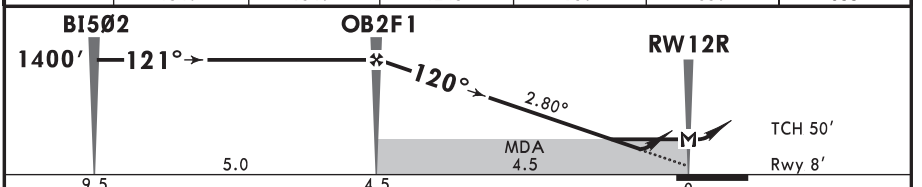
Alt Set: hPa Rwy Elev: 0 hPa Trans level: FL150 Trans alt: 13000′

RNP Apch
1. Baro-VNAV not authorized below 0°C. VPA exceed 3.5° above 56°C.
2. No circling authorized between R-180 and R-260 clockwise.



DIST to RW12R	6.0	5.0	4.0	3.0	2.0	1.0
ALTITUDE	1840′	1540′	1245′	950′	650′	355′

1 in=5 NM



Gnd speed-Kts		70	90	100	120	140	160
Glide Path Angle	2.80°	347	446	495	594	693	792
MAP at RW12R							

ALS
PAPI-L

2500′ on 120°

Std STRAIGHT-IN LANDING

	LNAV/VNAV	LNAV CDFA
	DA(H) 340′(332′)	1 DA/MDA(H) 430′(422′)
	ALS out	ALS out
A	R/V4000m	R/V4000m
B		
C		
D		

PANS OPS

1 VNAV DA(H) in lieu of MDA(H) depends on operator policy.

CHANGES: Procedure title, RNP note added.

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BRIEFING STRIP™

BREMEN Radar (APP)	*NEUBRANDENBURG Information
124.175	119.180

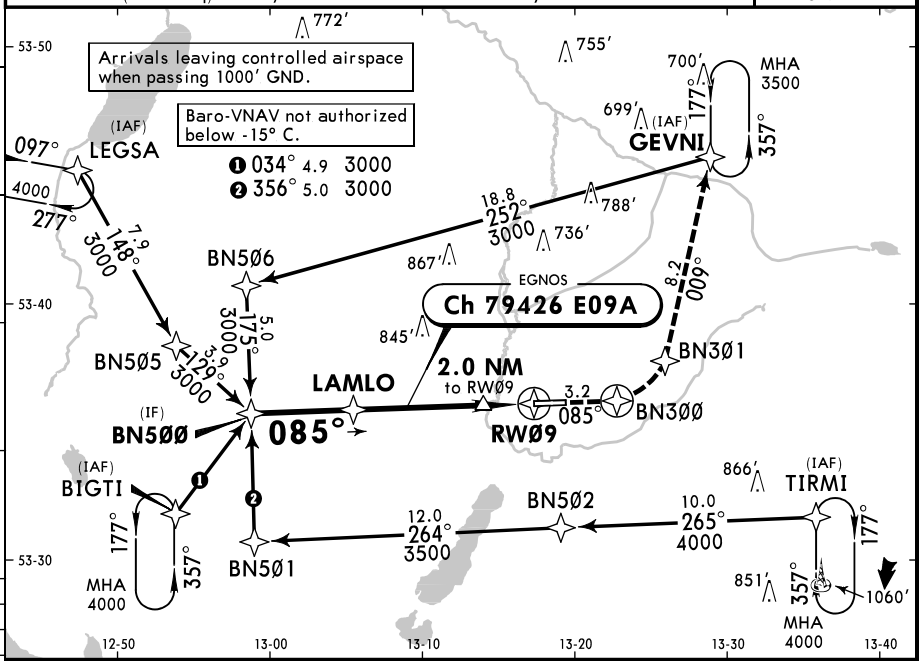
EGNOS	Final Apch Crs	LAMLO	LPV DA(H)	Apt Elev 228′
Ch 79426 E09A	085°	2500′(2299′)	621′(420′)	Rwy 201′

MISSED APCH: Climb STRAIGHT AHEAD to BN3ØØ, turn LEFT via BN3Ø1 on track 009° to GEVNI climbing to 3500′.

Alt Set: hPa (IN on req) Rwy Elev: 7 hPa Trans level: By ATC Trans alt: 5000′

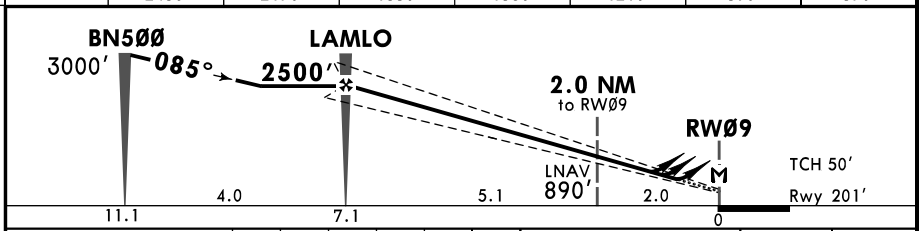
2100
MSA ARP

141



DIST to RWØ9	7.0	6.0	5.0	4.0	3.0	2.0	1.0
ALTITUDE	2480′	2170′	1850′	1530′	1210′	890′	570′

1 in=7.5 NM



Gnd speed-Kts		70	90	100	120	140	160
Glide Path Angle	3.00°	372	478	531	637	743	849
MAP at RWØ9							

HIALS
PAPI PAPI
BN3ØØ

Std/State

STRAIGHT-IN LANDING

	LPV		LNAV/VNAV		LNAV CDFA	
	DA(H) 621′(420′)	ALS out	A:501′(300′) C:521′(320′) DA(H) B:511′(310′) D:531′(330′)	ALS out	❶ DA/MDA(H) 620′(419′)	ALS out
A	R1200m	R1500m	R750m	R1400m	R1200m	R1500m
B						
C		R1900m				R1900m
D			R800m	R1500m		

PANS OPS

❶ VNAV DA(H) in lieu of MDA(H) depends on operator policy.

CHANGES: Call sign.

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BRIEFING STRIP™

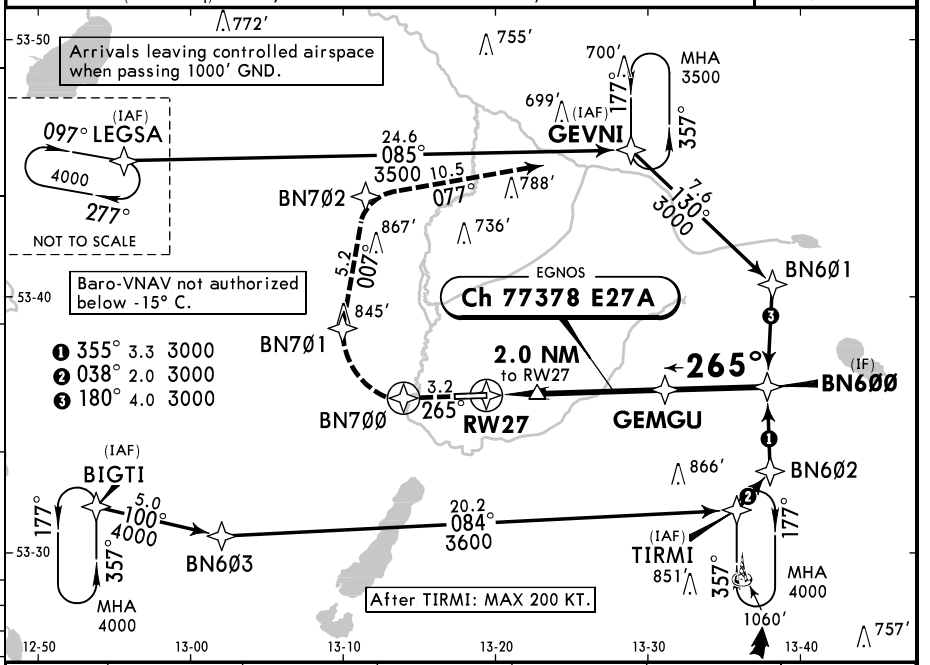
BREMEN Radar (APP)	*NEUBRANDENBURG Information
124.175	119.180

EGNOS	Final Apch Crs	GEMGU	LPV DA(H)	Apt Elev 228′
Ch 77378 E27A	265°	2500′(2273′)	647′(420′)	Rwy 227′

MISSED APCH: Climb STRAIGHT AHEAD to BN7ØØ, turn RIGHT via BN7Ø1 on track 007° to BN7Ø2. Turn RIGHT on track 077° to GEVNI climbing to 3500′.

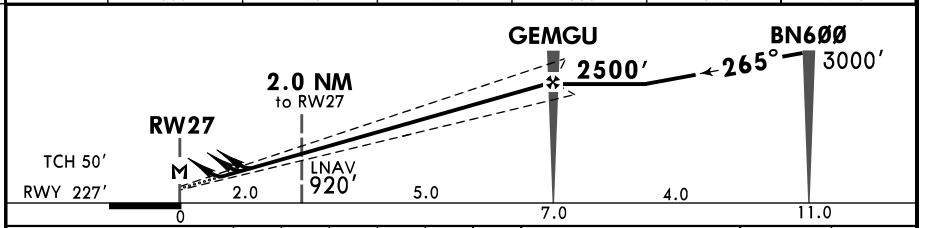
Alt Set: hPa (IN on req) Rwy Elev: 8 hPa Trans level: By ATC Trans alt: 5000′

2100
MSA ARP



DIST to RW27	1.0	2.0	3.0	4.0	5.0	6.0
ALTITUDE	600′	920′	1240′	1560′	1870′	2190′

1 in=7.5 NM



Gnd speed-Kts		70	90	100	120	140	160
Glide Path Angle	3.00°	372	478	531	637	743	849
MAP at RW27							

HIALS
PAPI PAPI
BN7ØØ

Std/State

STRAIGHT-IN LANDING

	LPV		LNAV/VNAV		LNAV CDFA	
	DA(H) 647′(420′)	ALS out	A:586′(359′) C:594′(367′) DA(H)B:590′(363′) D:598′(371′)	ALS out	❶ DA/MDA(H) 640′(413′)	ALS out
A	R1200m	R1500m	R900m	R1500m	R1200m	R1500m
B			R1000m			
C		R1900m		R1700m		R1900m
D						

PANS OPS

❶ VNAV DA(H) in lieu of MDA(H) depends on operator policy.

CHANGES: Call sign.

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BRIEFING STRIP™

ATIS	SEYCHELLES Approach	SEYCHELLES Tower	Tower (GND)
131.6	119.7	118.3	121.9

RNAV	Final Apch Crs	FREDY	RNP 0.15 DA(H)	Apt Elev 12′
	130°	2200′(2188′)	410′(398′)	Rwy 12′

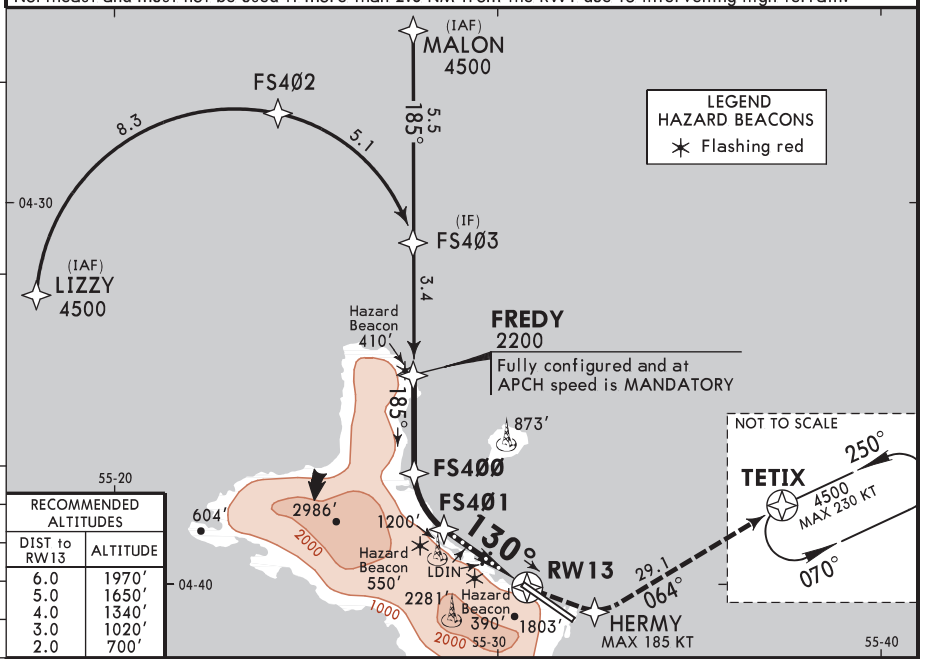
4500
MSA ARP

MISSED APCH: Immediately turn LEFT direct to HERMY (MAX 185 KT), then turn LEFT direct to TETIX. Climb to 4500′ and join holding.

RNP AR Apch	Alt Set: hPa	Rwy Elev: 0 hPa	Trans level: By ATC	Trans alt: 4500′

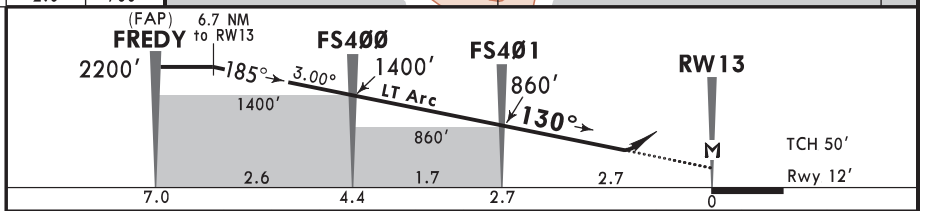
1. RF required. 2. RNP-0.30 required for missed approach.
3. Baro-VNAV not authorized below +5°C or above +46°C. 4. High terrain right side of final course.
5. Turbulence may be experienced with wind from westerly quadrants. 6.Downdraughts can be severe on short final. 7. If visual at MAP, intercept PAPI GS and continue to land. 8. PAPI is offset to the Northeast and must not be used if more than 2.6 NM from the RWY due to intervening high terrain.

142



RECOMMENDED ALTITUDES	
DIST to RW13	ALTITUDE
6.0	1970′
5.0	1650′
4.0	1340′
3.0	1020′
2.0	700′

1 in=5 NM



Gnd speed-Kts		70	90	100	120	140	160
Glide Path Angle	3.00°	372	478	531	637	743	849

HIALS
REIL PAPI PAPI
MAX 185 KT
LT
HERMY

Std/State STRAIGHT-IN LANDING

	RNP 0.15 DA(H) 410′(398′)		RNP 0.30 Missed apch climb gradient MIN 5.0% DA(H) 690′(678′)		RNP 0.30 Missed apch climb gradient MIN 2.5% DA(H) 810′(798′)	
		ALS out		ALS out		ALS out
A	R1400m	R1500m	R1500m		R1500m	
B						
C		R1800m	R2400m		R2400m	
D						

PANS OPS

CHANGES: Procedure title, RNP AR Apch.

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FSIA/SEZ
SEYCHELLES INTL

JEPPESEN 25 NOV 22 (12-21) Eff 1 Dec

SEYCHELLES, SEYCHELLES
RNP Rwy 31 (AR)

BRIEFING STRIP™

ATIS	SEYCHELLES Approach	SEYCHELLES Tower	Tower (GND)
131.6	119.7	118.3	121.9

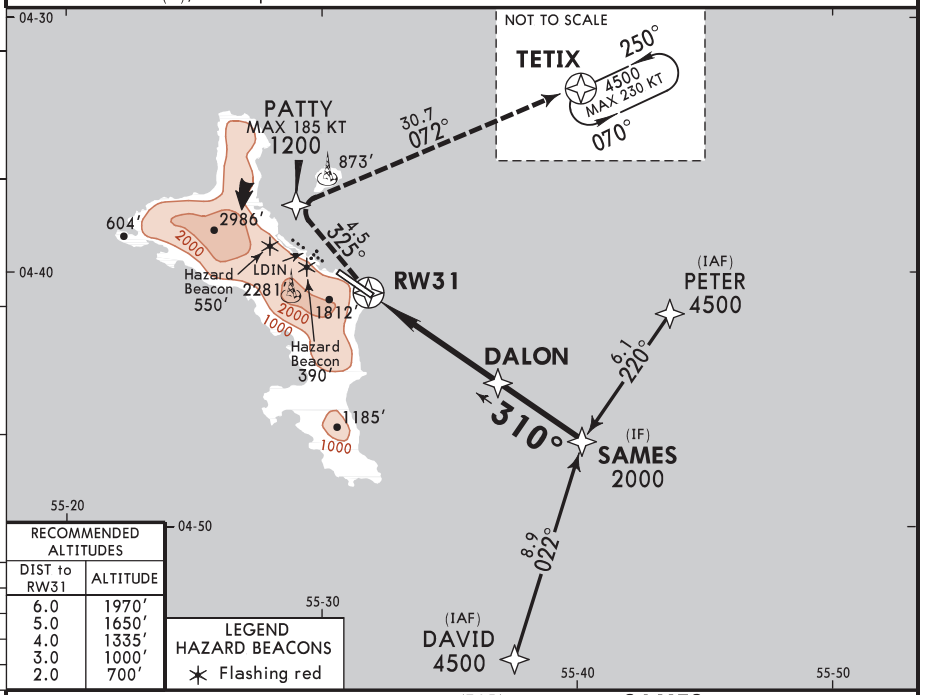
RNAV	Final Apch Crs	DALON	RNP 0.30 DA(H) Refer to Minimums	Apt Elev 12′ Rwy 12′
	310°	2000′(1988′)		

4500 MSA ARP

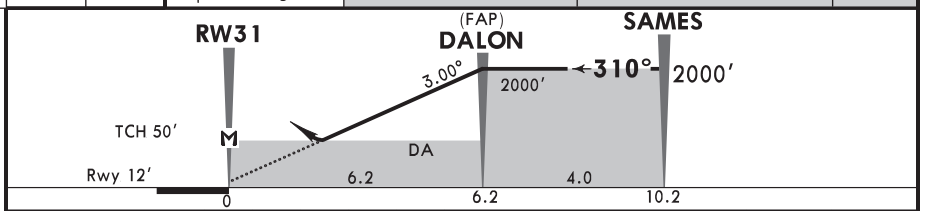
MISSED APCH: Immediately turn RIGHT direct to PATTY (MAX 185 KT) at or above 1200′, then turn RIGHT to TETIX. Climb to 4500′ and join holding.

RNP AR Apch | Alt Set: hPa | Rwy Elev: 0 hPa | Trans level: By ATC | Trans alt: 4500′

1. RNP-0.30 required for missed approach. 2. Baro-VNAV not authorized below +5°C or above +46°C.
3. Turbulence may be experienced with wind from westerly quadrants.
4. If visual at DA(H), intercept PAPI GS and continue to land.



RECOMMENDED ALTITUDES	
DIST to RW31	ALTITUDE
6.0	1970′
5.0	1650′
4.0	1335′
3.0	1000′
2.0	700′



Gnd speed-Kts	70	90	100	120	140	160
Glide Path Angle 3.00°	372	478	531	637	743	849

ALS: REIL, PAPI | PAPI | MAX 185 KT | RT | D | PATTY 1200′

Std/State STRAIGHT-IN LANDING

RNP 0.30

PANS OPS	Missed apch climb gradient MIN 5.0% DA(H) 460′(448′)	ALS out	Missed apch climb gradient MIN 2.5% DA(H) 750′(738′)	ALS out
A	R1500m		R1500m	
B				
C	R1900m	R2100m	R2400m	
D				

CHANGES: Procedure title, RNP AR Apch.

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BRIEFING STRIP™

D-ATIS	BREMEN Radar (APP)	*BREMEN Tower	*Ground
132.380	124.8	120.330 134.830	121.755

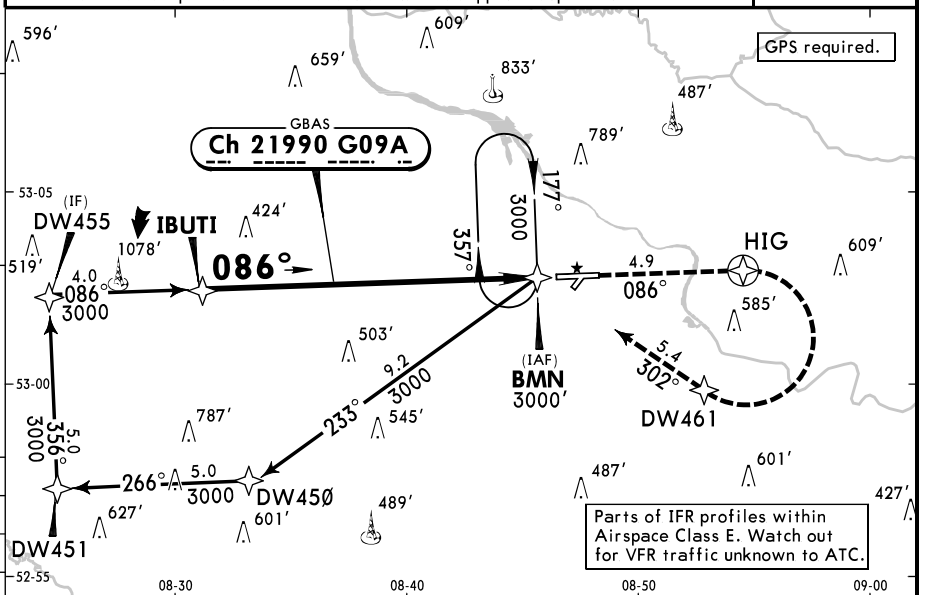
GBAS	Final Apch Crs	Minimum Alt IBUTI	GLS DA(H)	Apt Elev 14′
Ch 21990 G09A	086°	3000′(2987′)	213′(200′)	Rwy 13′

MISSED APCH: Climb on 086° to HIG, then turn RIGHT direct to DW461 and then to BMN climbing to 3000′.

Alt Set: hPa(IN on req) Rwy Elev: 0 hPa Trans level: By ATC Trans alt: 5000′

Aircraft must be capable and certified for GLS CAT I approach operations.

2100
MSA
ARP

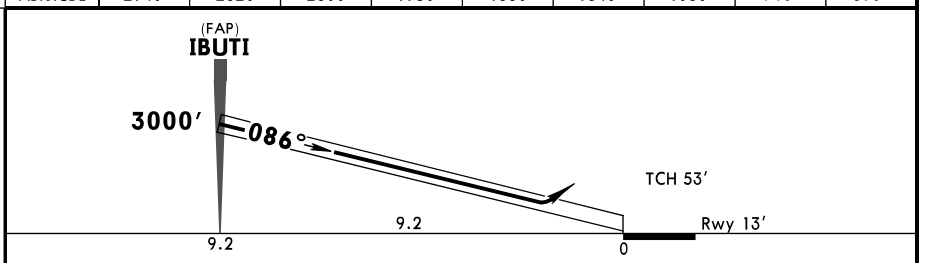


143

DIST to THR	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0
ALTITUDE	2940′	2620′	2300′	1980′	1660′	1340′	1030′	710′	390′

08-30 08-40 08-50 09-00

1 in=5 NM



Gnd speed-Kts	70	90	100	120	140	160
Glide Path Angle 3.00°	372	478	531	637	743	849
MAP at DA						

ALSF-II
REIL
PAPI

HIG on 086°

Standard

STRAIGHT-IN LANDING RWY **09**
GLS
DA(H) **213′**(200′)

PANS OPS

	FULL	TDZ or CL out	ALS out
A	RVR 550m	RVR 550m [1]	RVR 1200m
B			
C			
D			

[1] RVR 750m when a Flight Director or Autopilot or HUD to DA is not used.

CHANGES: Communications.

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EDDW/BRE
BREMEN

JEPPESEN
13 NOV 20 (12-41)

BREMEN, GERMANY
GLS Y Rwy 09

BRIEFING STRIP™

D-ATIS	BREMEN Radar (APP)	*BREMEN Tower		*Ground
132.380	124.8	120.330	134.830	121.755

GBAS	Final Apch Crs	Procedure Alt	GLS DA(H)	Apt Elev 14'
Ch 20757 G09D	**086°**	**DWØ5Ø** **1700'**(1687')	**213'**(200')	Rwy 13'

MISSED APCH: Climb on 086° to HIG, then turn RIGHT direct to DW461 and then to BMN climbing to 3000'.

Alt Set: hPa(IN on req) Rwy Elev: 0 hPa Trans level: By ATC Trans alt: 5000'

Aircraft must be capable and certified for GLS CAT I approach operations.

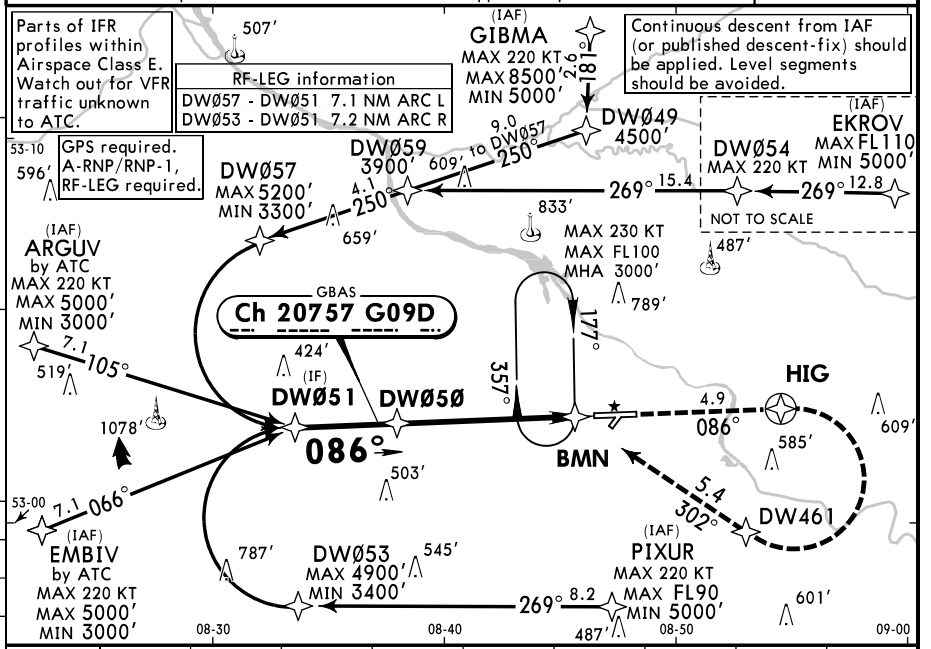
2100
MSA ARP

Parts of IFR profiles within Airspace Class E. Watch out for VFR traffic unknown to ATC.

RF-LEG information
DWØ57 - DWØ51 7.1 NM ARC L
DWØ53 - DWØ51 7.2 NM ARC R

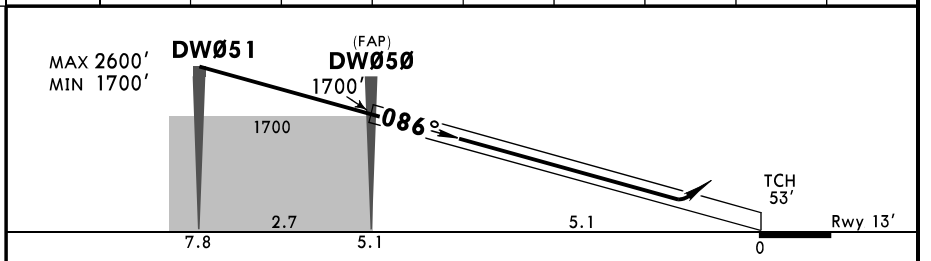
Continuous descent from IAF (or published descent-fix) should be applied. Level segments should be avoided.

GPS required. A-RNP/RNP-1, RF-LEG required.



DIST to THR	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0	1.0
ALTITUDE	2940'	2620'	2300'	1980'	1660'	1340'	1030'	710'	390'

1 in=5 NM



Gnd speed-Kts	70	90	100	120	140	160
Glide Path Angle 3.00°	372	478	531	637	743	849
MAP at DA						

ALSF-II
REIL
PAPI

HIG on 086°

Standard

STRAIGHT-IN LANDING RWY **09**
GLS

DA(H) **213'**(200')

PANS OPS

	FULL	TDZ or CL out	ALS out
A	RVR 550m	RVR 550m [1]	RVR 1200m
B			
C			
D			

[1] RVR 750m when a Flight Director or Autopilot or HUD to DA is not used.

CHANGES: Communications.

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VNKT/KTM
TRIBHUVAN INTL

JEPPESEN

12 AUG 22 (13-1)

KATHMANDU, NEPAL
VOR Rwy 02

MISSED APCH CLIMB GRADIENT MIN 5.0%

BRIEFING STRIP™

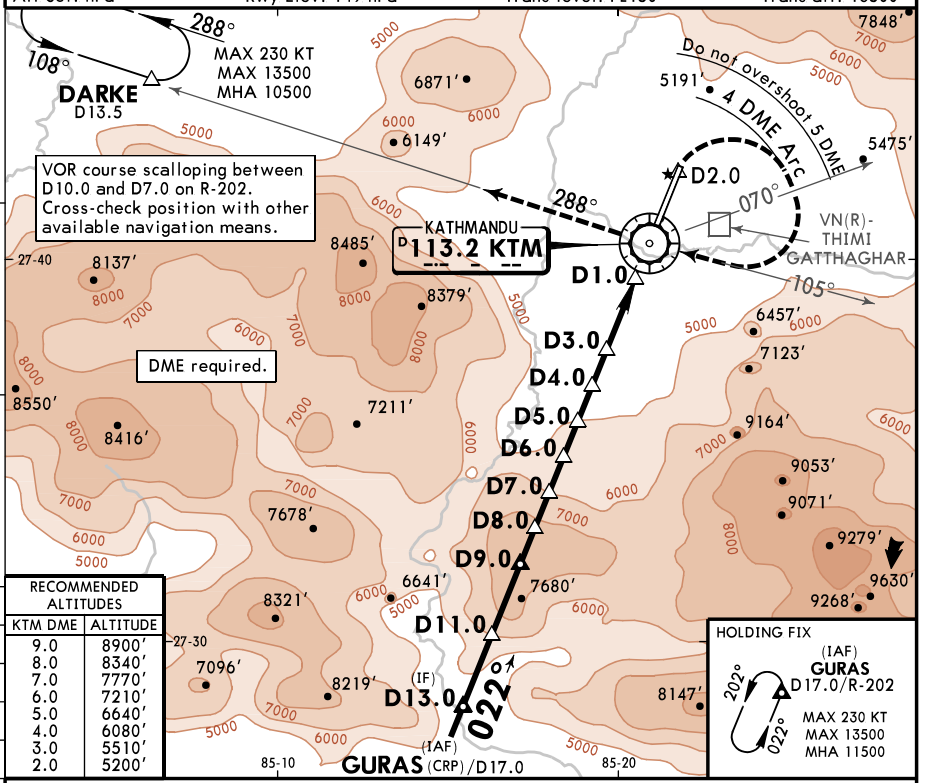
ATIS	KATHMANDU Approach	KATHMANDU Tower	Ground
127.0	120.6 125.1	118.1 118.5	121.9

VOR	Final Apch Crs	D9.0	MDA(H)	Apt Elev 4395′
KTM 113.2	022°	8900′(4580′)	4950′(630′)	Rwy 4320′

MISSED APCH: Climb STRAIGHT AHEAD on R-022 to D2.0, turn RIGHT (MAX 185 KT) onto 4 DME Arc (do not exceed 5 DME). Crossing R-070 turn RIGHT onto R-105 inbound VOR at or above 7500′. Follow R-288 to DARKE at or above 10500′.

MSA KTM VOR: 135° 21,100; 255° 10,500; 050° 11,600

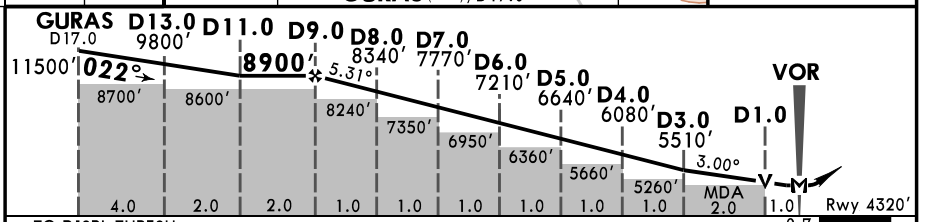
Alt Set: hPa | Rwy Elev: 149 hPa | Trans level: FL150 | Trans alt: 13500′



RECOMMENDED ALTITUDES	
KTM DME	ALTITUDE
9.0	8900′
8.0	8340′
7.0	7770′
6.0	7210′
5.0	6640′
4.0	6080′
3.0	5510′
2.0	5200′

HOLDING FIX
(IAF) GURAS D17.0/R-202
202°
022°
MAX 230 KT
MAX 13500
MHA 11500

1 in=5 NM



TO DISPL THRESH

Gnd speed-Kts		70	90	100	120	140	160
Descent Angle D9.0-D3.0	5.31°	659	847	941	1129	1318	1506
Descent Angle D3.0-THR	3.00°	372	478	531	637	743	849
MAP at VOR							

HIALS | REIL | PAPI | D2.0 | MAX 185 KT RT | 4 DME Arc

PANS OPS

State	STRAIGHT-IN LANDING Missed apch climb gradient MIN 5.0% MDA(H) 4950′(630′)		CIRCLE-TO-LAND [1] DAY		NIGHT
		ALS out	Max Kts	MDA(H)	
A	V1600m	V2400m	100	4950′(630′) V2400m	NOT AUTHORIZED
B			135		
C	V2800m	V3600m	C	NOT AUTHORIZED	
D	V3200m	V4000m	D		

[1] Circling height based on rwy 02 displ thresh elev of 4320′.

CHANGES: Rwy elevation.

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VNKT/KTM
TRIBHUVAN INTL

JEPPESEN

12 AUG 22 (13-2) CAT A & B

KATHMANDU, NEPAL
MISSED APCH CLIMB GRADIENT MIN 5.8%
VOR-A

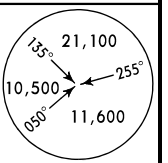
BRIEFING STRIP™

ATIS	KATHMANDU Approach	KATHMANDU Tower	Ground
127.0	120.6 125.1	118.1 118.5	121.9

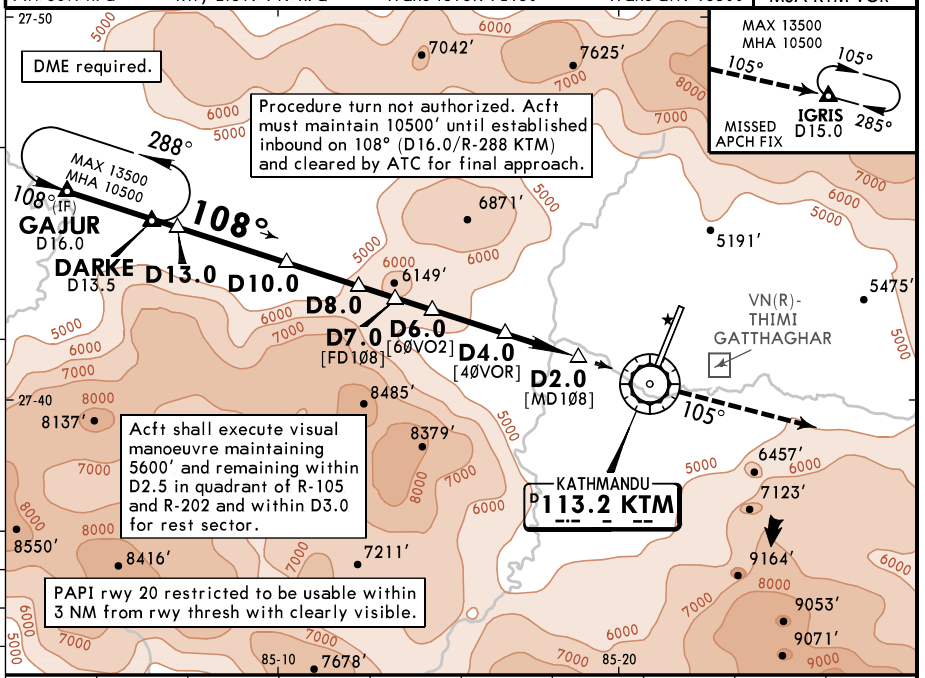
VOR KTM	Final Apch Crs	D7.0	MDA(H)	Apt Elev 4395′
113.2	108°	7500′(3180′)	5600′(1280′)	Rwy 02: 4320′

MISSED APCH: Climb STRAIGHT AHEAD to VOR, then proceed outbound on R-105 to to reach IGRIS/D15.0 at or above 10500′ and join holding pattern.

Alt Set: hPa Rwy Elev: 149 hPa Trans level: FL150 Trans alt: 13500′

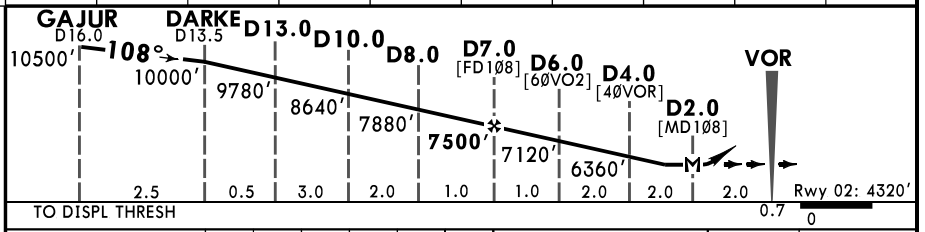


MSA KTM VOR



KTM DME	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	2.0
ALTITUDE	8640′	8260′	7880′	7500′	7120′	6740′	6360′	5980′	5600′

1 in=5 NM



Gnd speed-Kts		70	90	100	120	140	160
Descent Angle	3.60°	446	573	637	765	892	1019
MAP at D2.0							

Lighting-Refer to Airport chart

Refer to Missed Apch above

PANS OPS

State

CIRCLE-TO-LAND [1]
Missed apch climb gradient MIN 5.8%

Max Kts	DAY MDA(H)	NIGHT Rwy 20: NOT AUTH MDA(H)
100	5600′(1280′) V3700m	5600′(1280′) V5000m
135		
C	NOT AUTHORIZED	
D		

[1] Circling height based on rwy 02 displ thresh elev of 4320′.

CHANGES: Rwy elevation.

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KEDW/EDW
EDWARDS, CALIF

JEPPESEN
8 JUL 22
Eff 14 Jul
33-3

EDWARDS AFB
VOR DME or TACAN Y Rwy 23L

BRIEFING STRIP™

*ATIS		JOSHUA Approach (R)		*EDWARDS Tower		*Ground	
127.425	269.9	133.65	348.7	CTAF 120.7	318.1	121.8	225.4

VORTAC EDW	TACAN EDW	Final Apch Crs	VORTAC	MDA(H)	Apt Elev 2311′
116.4	CH 111X	226°	4500 (2214′)	2640′(354′)	TDZE 2286′

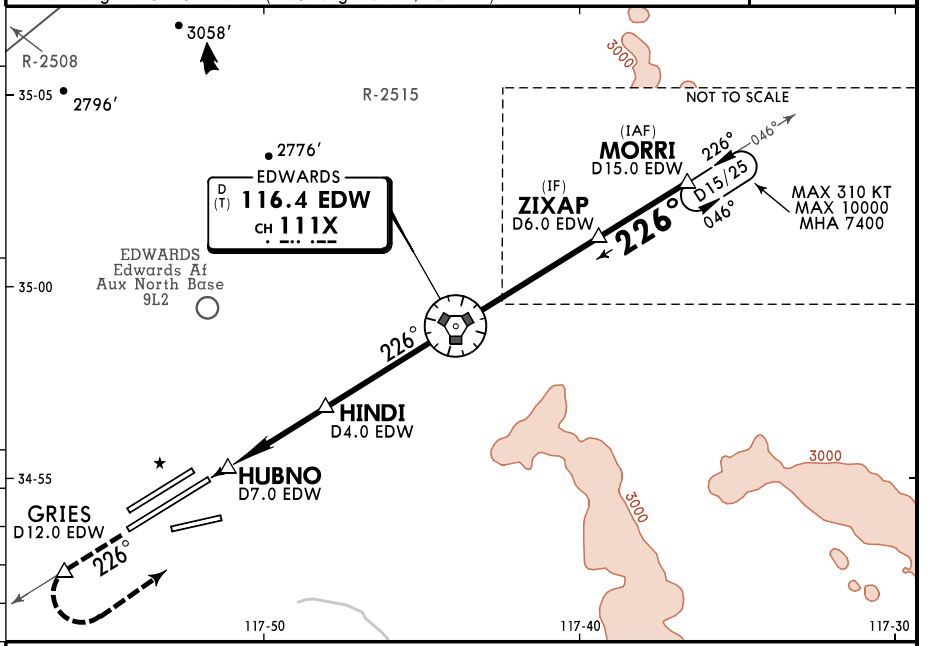
MISSED APCH: Climb to 7400′. Track EDW VORTAC R-226 outbound to GRIES/D12.0 EDW, then turn LEFT direct MORRI/D15.0 EDW and hold. Missed Apch requires use of RNAV or ATC radar monitoring.

Alt Set: INCHES — Trans level: FL 180 — Trans alt: 18000′

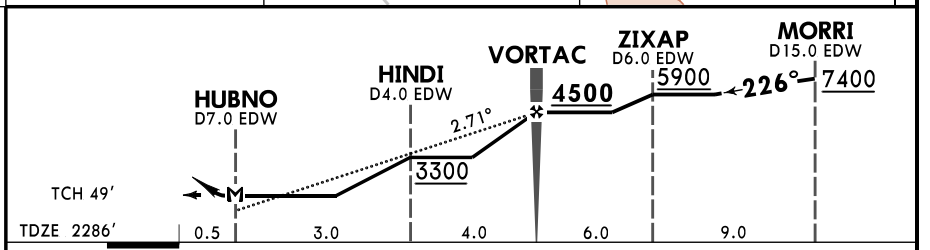
1. CAUTION: Do not mistake South Base Rwy 25 for Rwy 23L. 2. EMERG SAFE ALT 100 NM 16,500′. 3. Circling not authorized at night to Rwy 5L-23R. 4. VGSI and descent angles not coincident (VGSI angle 3.00°/TCH 49′).

7700

MSA EDW VORTAC



1 in=5 NM



Gnd speed-Kts	70	90	100	120	140	160
Descent Angle 2.71°	336	431	479	575	671	767
MAP at HUBNO						

REIL
PAPI-L

7400′

EDW
CH 111X
116.4
R-226

GRIES

Military STRAIGHT-IN LANDING

MDA(H) 2640′(354′)

A	400′ -V1
B	
C	
D	
E	

CIRCLE-TO-LAND

Not Authorized Northwest of Rwy 5L-23R

Max Kts	MDA(H)	
90	2880′(569′)	600′ -V1
120		
140	2880′(569′)	600′ -V1 1/2
165	2880′(569′)	600′ -V2
200		

TERPS MIL (USAF) AMEND 2

CHANGES: Approach communications.

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KEDW/EDW
EDWARDS, CALIF

JEPPESEN
8 JUL 22
Eff 14 Jul

(33-4)

EDWARDS AFB
VOR DME or TACAN Rwy 23R

BRIEFING STRIP™

*ATIS		JOSHUA Approach (R)		*EDWARDS Tower		*Ground	
127.425	269.9	133.65	348.7	CTAF 120.7	318.1	121.8	225.4

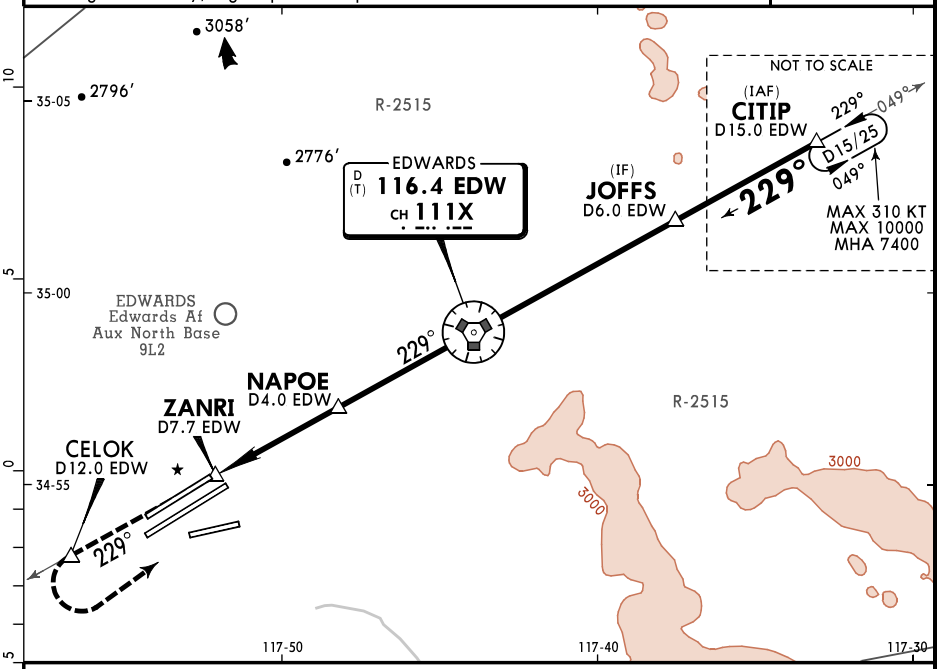
VORTAC EDW	TACAN EDW	Final Apch Crs	VORTAC	MDA(H)	Apt Elev 2311′
116.4	CH 111X	229°	4500 (2204′)	2680′(384′)	TDZE 2296′

MISSED APCH: Track EDW VORTAC R-229 outbound to CELOK/D12.0 EDW, then turn LEFT to CITIP/D15.0 EDW and hold.
Missed approach requires use of RNAV or ATC radar monitoring.

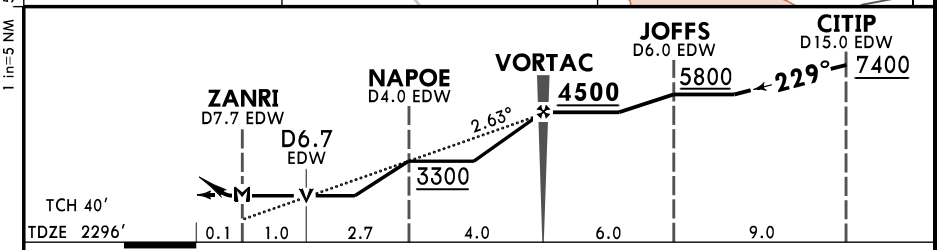
Alt Set: INCHES | Trans level: FL 180 | Trans alt: 18000′

1. EMERG SAFE ALT 100 NM 16,500′. 2. Circling not authorized at night to Rwy 5L-23R. 3. Unlighted runway, night operations prohibited.

7700
MSA EDW VORTAC



1 in=5 NM



Gnd speed-Kts	70	90	100	120	140	160
Descent Angle 2.63°	326	419	465	558	651	744
MAP at ZANRI						

EDW CH 111X 116.4 R-229 | CELOK | LT | CITIP

Military STRAIGHT-IN LANDING

MDA(H) **2680′**(384′)

A	400′ -V1
B	
C	400′ -V1 1/8
D	
E	

CIRCLE-TO-LAND

Not Authorized Northwest of Rwy 5L-23R

Max Kts	MDA(H)	
90	2880′(569′)	600′ -V1
120		
140	2880′(569′)	600′ -V1 1/2
165	2880′(569′)	600′ -V2
200		

TERPS MIL (USAF) AMEND 1

CHANGES: Approach communications.

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ATIS	NOI BAI Arrival	NOI BAI Terminal	NOI BAI Tower	Ground
127.0	121.0	125.1	118.4	121.9

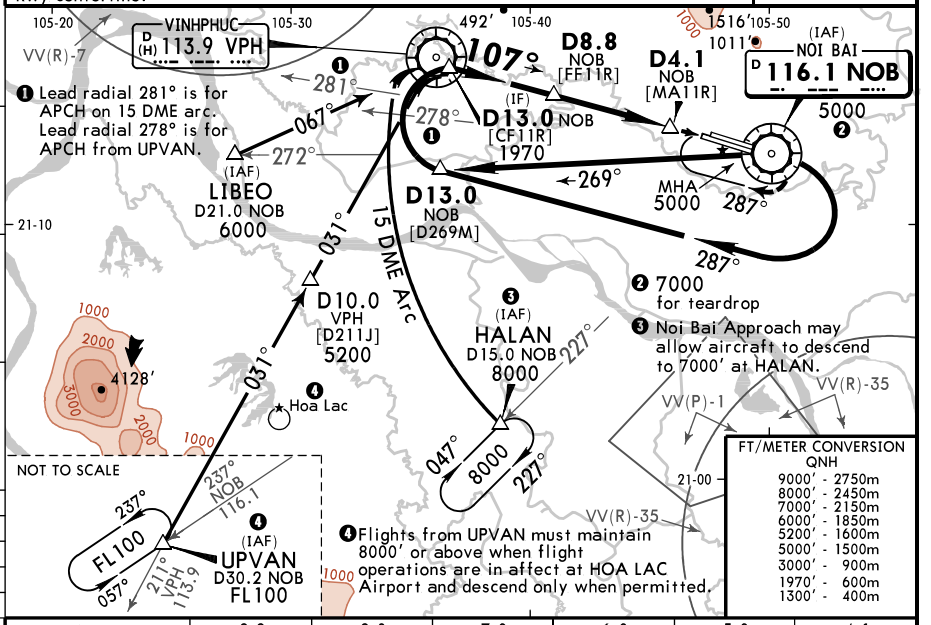
VOR NOB	Final Apch Crs	D8.8	MDA(H)	Apt Elev 43′
116.1	107°	1970′(1931′)	500′(461′)	Rwy 39′

MISSED APCH: Maintain final approach, passing NOB VOR turn RIGHT, continue climbing to 5000′. Join holding pattern or follow NOI BAI Tower instructions.

Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL100 Trans alt: 9000′

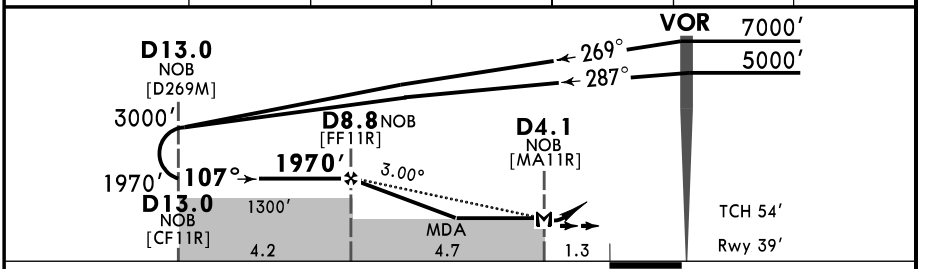
1. DME required. 2. The final approach track is 2° offset from the south of extended Rwy centerline.

MSA NOB VOR: 6400 5400 5400 2600 (091°–271°, 181°, 100°)



NOB DME	8.8	8.0	7.0	6.0	5.0	4.1
ALTITUDE	1970′	1720′	1400′	1080′	760′	500′

1 in=7.5 NM



Gnd speed-Kts		70	90	100	120	140	160
Descent Angle	3.00°	372	478	531	637	743	849
MAP at D4.1							
D8.8 to MAP	4.7	4:02	3:08	2:49	2:21	2:01	1:46

ALSF-II
REIL
PAPI
NOB 116.1
RT
5000′

State

STRAIGHT-IN LANDING

MDA(H) 500′(461′)

		ALS out
A	460′- V1600m	460′- V2200m
B		
C	460′- V2000m	
D	460′- V2400m	

CIRCLE-TO-LAND
Authorized in the South of Rwy

Max Kts	MDA(H)	
100	660′(617′)	660′- V2000m
135	1190′(1147′)	1320′- V4000m
180	1480′(1437′)	1650′- V5000m
205	1970′(1927′)	1970′- V6000m

PANS OPS

CHANGES: Chart reindexed, procedure revised.

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VVNB/HAN
NOI BAI INTL

JEPPESEN
18 FEB 22 (13-4) Eff 24 Feb

HANOI, VIETNAM
VOR Y Rwy 11R

BRIEFING STRIP™

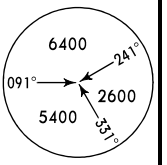
ATIS	NOI BAI Arrival	NOI BAI Terminal	NOI BAI Tower	Ground
127.0	121.0	125.1	118.4	121.9

VOR VPH	Final Apch Crs	D4.5	MDA(H)	Apt Elev 43′ Rwy 39′
113.9	107°	2100′(2061′)	520′(481′)	

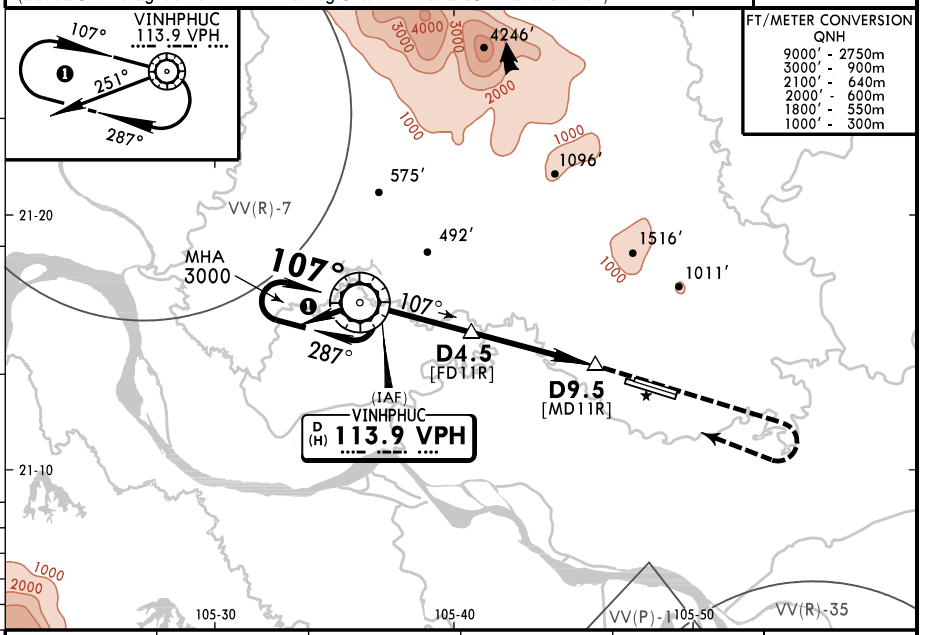
MISSED APCH: Maintain final approach track, passing 2000′ turn RIGHT to VPH VOR at 3000′. Join holding pattern or follow NOI BAI Tower instructions.

Alt Set: hPa Rwy Elev: 1 hPa Trans level: FL100 Trans alt: 9000′

1. DME required. 2. This procedure is only used when having ATC approval (based on the agreement with the Regional ATM and Command Center).

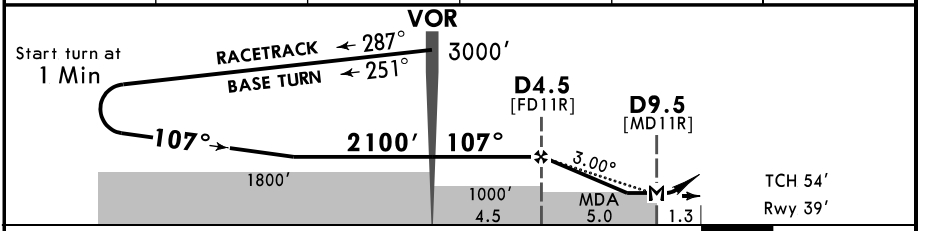


MSA VPH VOR



VPH DME	4.5	6.0	7.0	8.0	9.5
ALTITUDE	2100′	1630′	1310′	990′	520′

1 in=7.5 NM



Gnd speed-Kts		70	90	100	120	140	160
Descent Angle	3.00°	372	478	531	637	743	849
MAP at D9.5							
D4.5 to MAP	5.0	4:17	3:20	3:00	2:30	2:09	1:53

ALSF-II
REIL
PAPI

2000′

RT

VPH 113.9 at 3000′

PANS OPS

State

	STRAIGHT-IN LANDING		CIRCLE-TO-LAND Authorized in the South of Rwy		
	MDA(H) 520′ (481′)	ALS out	Max Kts	MDA(H)	
A	500′- V2400m		100	660′(617′)	660′- V2000m
B			135	1190′(1147′)	1320′- V4000m
C			180	1480′(1437′)	1650′- V5000m
D	500′- V2800m		205	1970′(1927′)	1970′- V6000m

CHANGES: Chart reindexed, procedure revised.

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EGVN/BZZ
BRIZE NORTON

JEPPESEN 1 DEC 23 (14-1) CAT C, D & E

BRIZE NORTON, UK
TACAN Rwy 07

BRIEFING STRIP™

*ATIS		*BRIZE Approach		*BRIZE Director	
126.5X	284.975	127.250 ❶	231.950 ❶	133.750	399.025

*BRIZE Tower		*Ground	
123.725	269.175	121.725	341.2

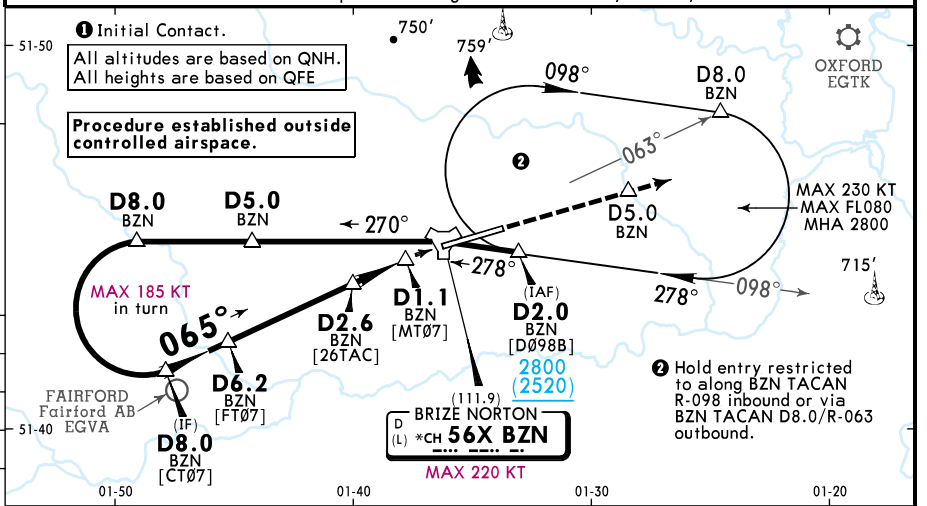
TACAN BZN *CH 56X (111.9)	Final Apch Crs 065°	D6.2 BZN 2300 (2020)	MDA(H) Refer to Minimums	Apt Elev 287' Rwy 284'

MISSED APCH: Climb on Rwy track to 1800'(1520') and contact Brize Approach. If no contact by D5.0 BZN, climb to 2300' (2020'), then turn RIGHT to return to hold. Complete at least one hold before flying another approach.

180° 2000 265° 2300
MSA BZN TACAN

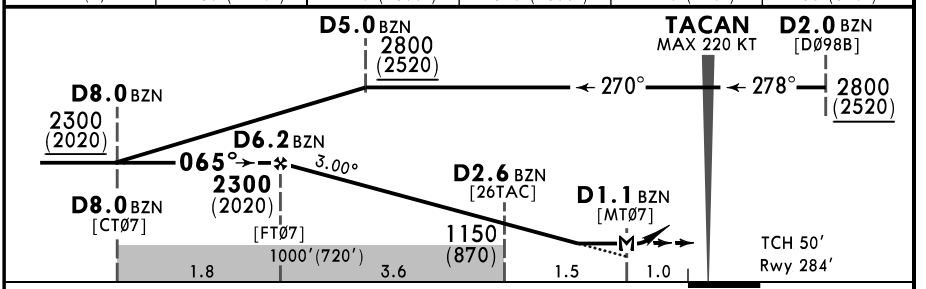
Alt Set: hPa Rwy Elev: 10 hPa Trans level: By ATC Trans alt: 6000' (Outside Daventry CTA: 3000')

1. CAUTION: Procedure flown with QNH. QFE available by exception. 2. Final apch track offset 8° from RCL. 3. Non PANS-OPS sectors 1 and 2 join at holding fix for UK military use only.



BZN DME	6.0	5.0	4.0	3.0	2.0
ALT(H)	2230'(1940')	1910'(1600')	1590'(1300')	1270'(990')	960'(670')

1 in=5 NM



Gnd speed-Kts		70	90	100	120	140	160
Descent Angle	3.00°	372	478	531	637	743	849
MAP at D1.1 BZN							

HIALS PAPI PAPI

1800' (1520') on RT Rwy track

MIPS MIL

Military STRAIGHT-IN LANDING

MDA(H) C: **700'**(420') D: **720'**(440') E: **770'**(490')

A/B	NOT APPLICABLE	NOT APPLICABLE (ALS out)
C	V1200m	V1900m
D	V1300m	V2000m
E	V1500m	V2300m

CIRCLE-TO-LAND

Prohibited North of Rwy

Max Kts	MDA(H)	
A/B	NOT APPLICABLE	
180	1060'(780')	V2400m
205	1160'(880')	V3600m
E	1260'(980')	V3600m

CHANGES: Altitude limitation on D6.2 BZN withdrawn.

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EGVN/BZZ
BRIZE NORTON

JEPPESEN
1 DEC 23 (14-2) CAT A & B

BRIZE NORTON, UK
TACAN Rwy 07

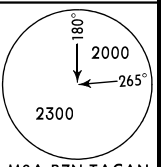
BRIEFING STRIP™

*ATIS		*BRIZE Approach		*BRIZE Director	
126.5X	284.975	127.250❶	231.950❶	133.750	399.025

*BRIZE Tower		*Ground	
123.725	269.175	121.725	341.2

TACAN	Final Apch Crs	D4.8 BZN	MDA(H)	Apt Elev 287′
BZN *CH 56X (111.9)	065°	1800 (1520)	680′ (400′)	Rwy 284′

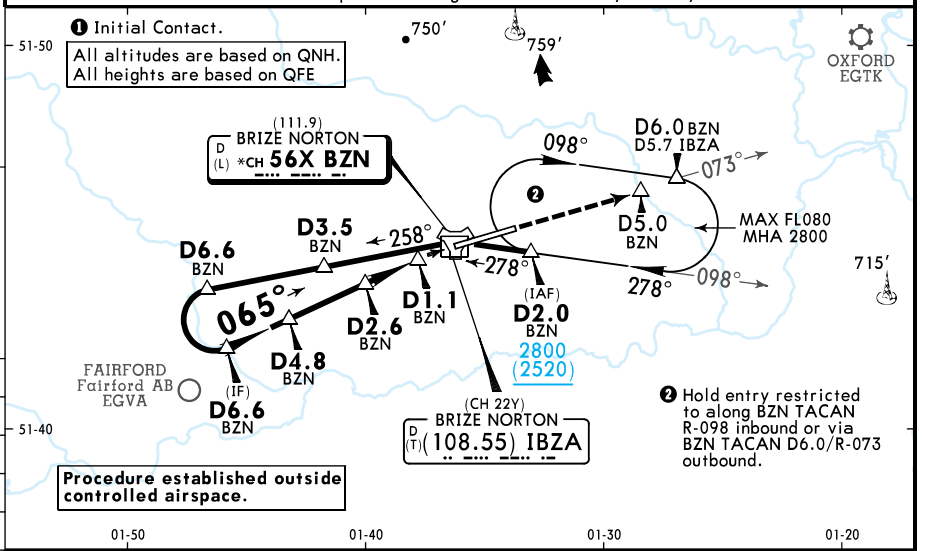
MISSED APCH: Climb on Rwy track to 1800′(1520′) and contact Brize Approach. If no contact by D5.0 BZN, climb to 2300′ (2020′), then turn RIGHT to return to hold. Complete at least one hold before flying another approach.



MSA BZN TACAN

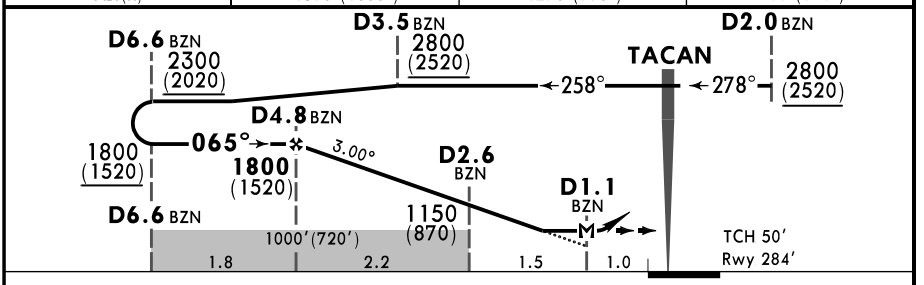
Alt Set: hPa Rwy Elev: 10 hPa Trans level: By ATC Trans alt: 6000′ (Outside Daventry CTA: 3000′)

1. CAUTION: Procedure flown with QNH. QFE available by exception. 2. Final apch track offset 8° from RCL. 3. Non PANS-OPS sectors 1 and 2 join at holding fix for UK military use only.



BZN DME	4.0	3.0	2.0
ALT(H)	1590′(1300′)	1270′(990′)	960′(670′)

1 in=5 NM



Gnd speed-Kts		70	90	100	120	140	160
Descent Angle	3.00°	372	478	531	637	743	849
MAP at D1.1 BZN							

HIALS
PAPI PAPI
1800′ (1520′) on RT Rwy track

Military

STRAIGHT-IN LANDING

MDA(H) 680′(400′)

		ALS out
A	V1100m	V1800m
B		
C/D/E	NOT APPLICABLE	NOT APPLICABLE

CIRCLE-TO-LAND

Prohibited North of Rwy

Max Kts	MDA(H)	
100	730′(450′)	V1800m
135	830′(550′)	V1800m
C/D/E	NOT APPLICABLE	

MIPS MIL

CHANGES: Altitude limitation on D4.8 BZN withdrawn, minimums.

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BRIEFING STRIP™

D-ATIS	HARBIN Approach (R) APP01	APP02	APP03	HARBIN Tower	*Ground
127.4	119.65	119.05X	120.65X	118.7	121.85

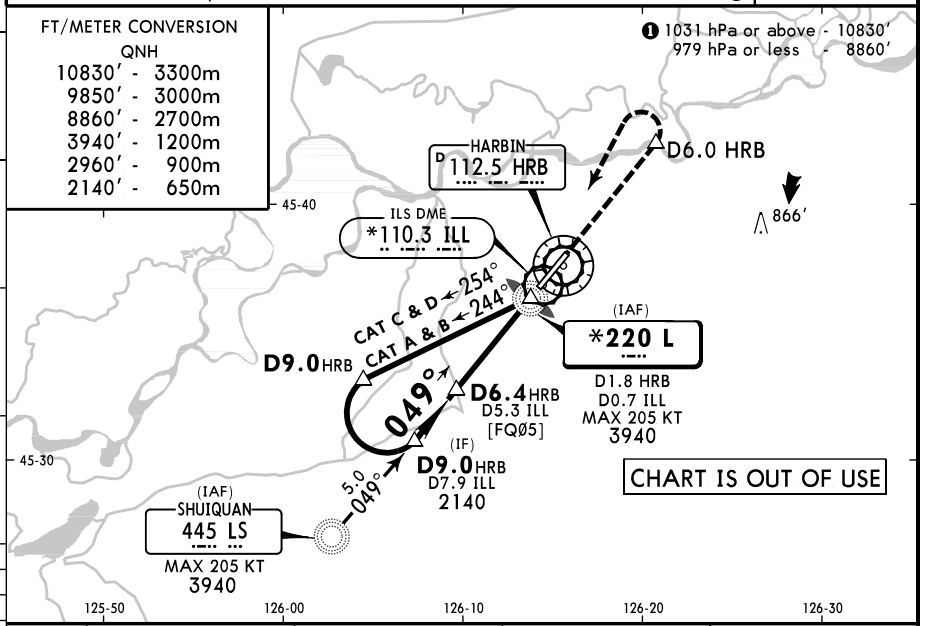
Lctr	Final Apch Crs	D6.4 HRB	MDA(H)	Apt Elev 457′
L *220	049°	2140′(1683′)	860′(403′)	Rwy 457′

MISSED APCH: Climb STRAIGHT AHEAD to D6.0 HRB, then turn LEFT to L Lctr at 2960′, contact ATC. MAX 205 KT.

3000
MSA HRB VOR

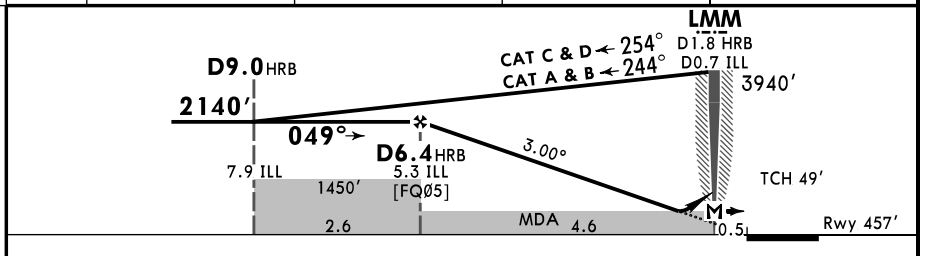
Alt Set: hPa Rwy Elev: 17 hPa Trans level: FL118 Trans alt: 9850′ ❶

148



HRB DME	6.0	5.0	4.0	3.0
ALTITUDE	2000′	1680′	1370′	1050′

1 in=7.5 NM



Gnd speed-Kts	70	90	100	120	140	160
Descent Angle 3.00°	372	478	531	637	743	849
MAP at LMM/D1.8 HRB/D0.7 ILL						

HIALS
PAPI

205 KT MAX

D6.0 HRB

PANS OPS

State

STRAIGHT-IN LANDING
CDFA
MDA(H) **860′**(403′)

		ALS out
A	R/V1500m	V2400m
B		
C		
D	R/V1600m	

CIRCLE-TO-LAND
West of runway only

Max Kts	MDA(H)
100	970′(513′) V1900m
135	970′(513′) V2800m
180	1170′(713′) V3700m
205	1200′(743′) V4600m

CHANGES: Speed restrictions.

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ZYHB/HRB
TAIPING

JEPPESEN
19 JAN 24 (16-2) Eff 24 Jan 1600Z

HARBIN, PR OF CHINA
NDB DME Rwy 23

BRIEFING STRIP™

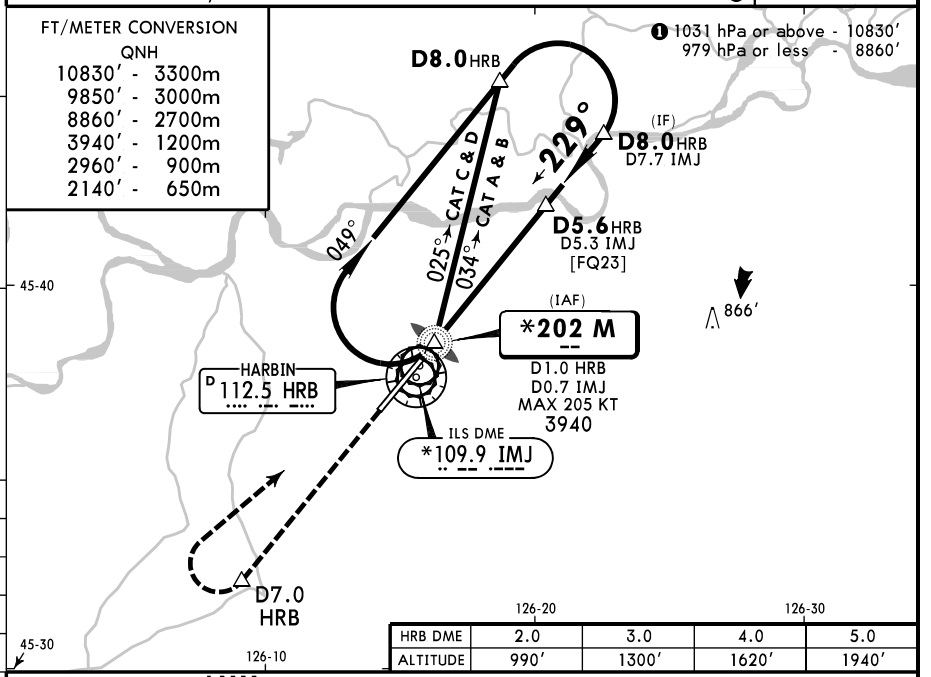
D-ATIS	HARBIN Approach (R) APP01	APP02	APP03	HARBIN Tower	*Ground
127.4	119.65	119.05X	120.65X	118.7	121.85

Lctr	Final Apch Crs	D5.6 HRB	MDA(H)	Apt Elev 457′
M *202	229°	2140′(1700′)	840′(400′)	Rwy 440′

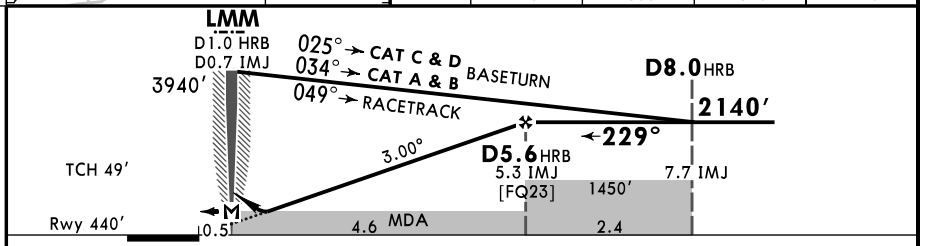
MISSED APCH: Climb STRAIGHT AHEAD to D7.0 HRB, then turn RIGHT to M Lctr at 2960′, contact ATC. MAX 205 KT.

3000
MSA HRB VOR

Alt Set: hPa | Rwy Elev: 16 hPa | Trans level: FL118 | Trans alt: 9850′ ❶



HRB DME	2.0	3.0	4.0	5.0
ALTITUDE	990′	1300′	1620′	1940′



Gnd speed-Kts	70	90	100	120	140	160
Descent Angle 3.00°	372	478	531	637	743	849
MAP at LMM/D1.0HRB/D0.7 IMJ						

HIALS
PAPI

205 KT MAX

D7.0 HRB

PANS OPS

State

STRAIGHT-IN LANDING
CDFA
MDA(H) **840′**(400′)

		ALS out
A	R/V1500m	V2400m
B		
C		
D	R/V1600m	

CIRCLE-TO-LAND
West of runway only

Max Kts	MDA(H)
100	970′(513′) V1900m
135	970′(513′) V2800m
180	1170′(713′) V3700m
205	1200′(743′) V4600m

CHANGES: Speed restrictions.

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BRIEFING STRIP™

D-ATIS	DELHI Arrival (APP)	DELHI Approach (R)		DELHI Tower North	Ground North
126.4	124.2	126.350	125.675	118.750	121.750

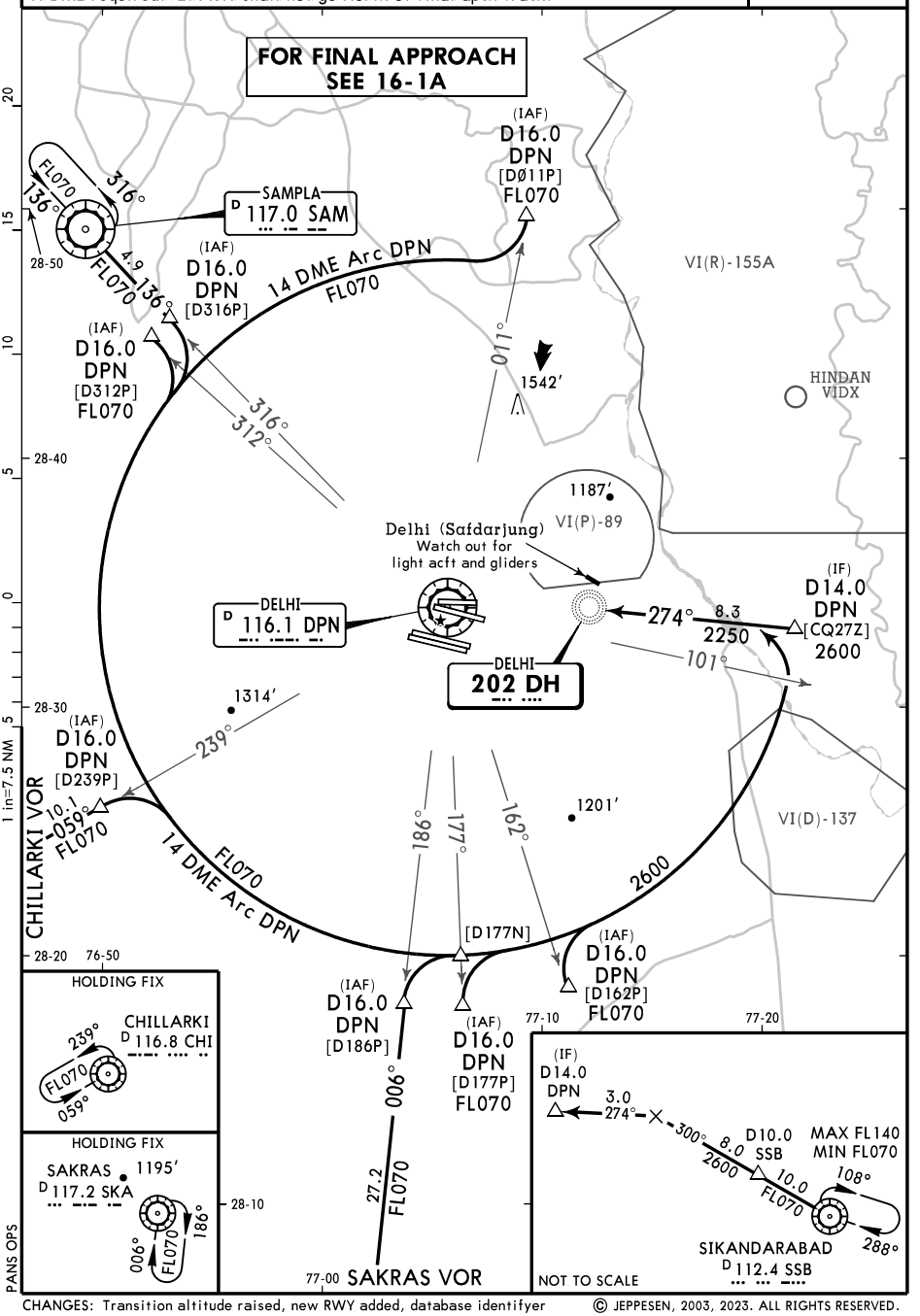
NDB DH	Final Apch Crs	Refer to chart 16-1A	MDA(H) Refer to chart 16-1A	Apt Elev 778′ Rwy 752′
202	274°			

Alt Set: hPa Rwy Elev: 27 hPa Trans level: By ATC Trans alt: 5000′

1. DME required. 2. Acft shall not go North of final apch track.

2600
MSA DH NDB

149



PANS OPS

CHANGES: Transition altitude raised, new RWY added, database identifyer

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VIDP/DEL
INDIRA GANDHI INTL

JEPPESEN

7 JUL 23 (16-1A) Eff 13 Jul

DELHI, INDIA
NDB Z Rwy 27

BRIEFING STRIP™

D-ATIS	DELHI Arrival (APP)	DELHI Approach (R)		DELHI Tower North	Ground North
126.4	124.2	126.350	125.675	118.750	121.750

NDB DH	Final Apch Crs	DH NDB	MDA(H)	Apt Elev 778′
202	274°	2250′(1498′)	1340′(588′)	Rwy 752′

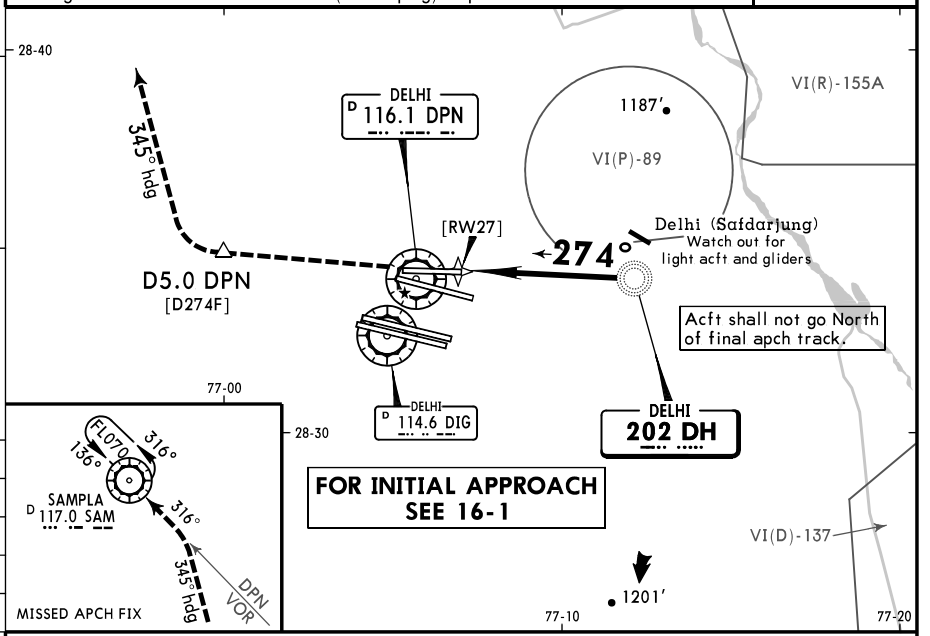
MISSED APCH: Climb STRAIGHT AHEAD to 2600′. Crossing D5.0 DPN turn RIGHT on heading 345° to intercept R-316 DPN climbing to FL070 to join SAM VOR holding at FL070, or as directed.

2600

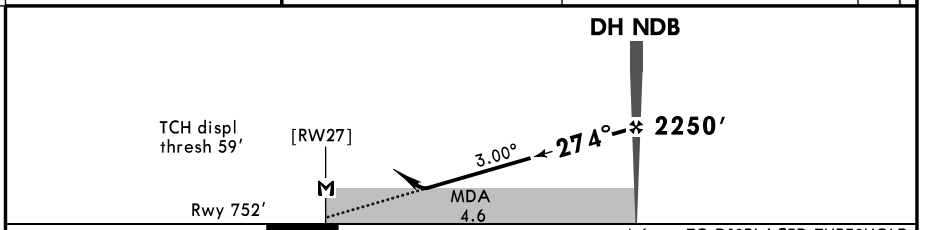
MSA DH NDB

Alt Set: hPa Rwy Elev: 27 hPa Trans level: By ATC Trans alt: 5000′

1. DME required. 2. CAUTION: Identify DELHI (Indira Gandhi Intl) airport before landing in order not to mistake DELHI (Safdarjung) airport.



1 in=5 NM



Gnd speed-Kts	70	90	100	120	140	160
Descent Angle 3.00°	372	478	531	637	743	849
DH NDB to MAP 4.6	3:57	3:04	2:46	2:18	1:58	1:43

HIALS PAPI | 2600′ | D5.0 DPN

Std/State

STRAIGHT-IN LANDING
CDFA
MDA(H) 1340′(588′)

ALS out

PANS OPS

A	R1500m	
B		
C	R2300m	R2400m
D		

1 VNAV DA(H) in lieu of MDA(H) requires height loss adjustment.

CHANGES: Transition altitude raised, new RWY added.

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RKTH/KPO

POHANG GYEONGJU

JEPPESEN

8 JUL 22 (18-1) Eff 13 Jul 1600Z

POHANG, KOREA
PAR ALL Rwys
ASR ALL Rwys

BRIEFING STRIP™

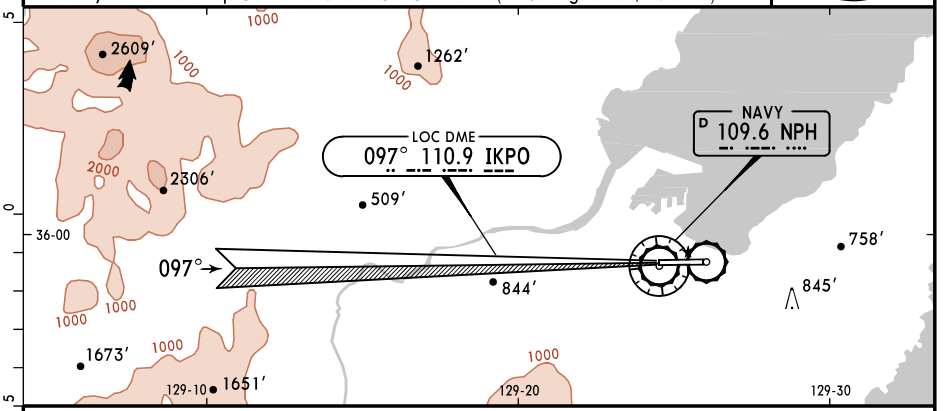
*ATIS	POHANG Approach (R)		POHANG Arrival		POHANG Tower	Ground
127.4	124.25	120.2	134.1	133.4	118.05	126.2

RADAR	Final Apch Crs By ATC	Minimum Alt No FAF	DA(H)/MDA(H) Refer to Minimums	Apt Elev 76′ TDZE - See below	No MSA published

Missed Approach - See below.

Alt Set: hPa Apt Elev: 3 hPa Trans level: FL140 Trans alt: 14000′

PAR Rwy 28: PAPI and procedure TCH is not coincident (VGSI angle 3.5°/TCH 86′).



MISSED APCH:

PAR Rwy 10: Climb to 5000′ via heading 097° to D2.0 NPH VOR and climbing LEFT turn heading 030°, then as directed by ATC.
ALTERNATE: Climb to 5000′ via heading 097°, then as directed by ATC.
Missed approach requires minimum climb of 340′/NM to 5000′.

PAR Rwy 28: At DH, climb to 5000′ via heading 277°, then as directed by ATC.

ASR Rwy 10: Climb to 5100′ via heading 097° to D2.0 NPH VOR, then climbing LEFT turn heading 030°, then as directed by ATC.
ALTERNATE: Climb to 5100′ via heading 097°, then as directed by ATC.

ASR Rwy 28: Climb to 5100′ via heading 277°, then as directed by ATC.

RWY 10	RWY 28
PAR TCH 56′	PAR TCH 60′
TDZE 76′	TDZE 70′

Gnd speed-Kts		70	90	100	120	140	160
RWY 10 PAR GS	3.00°	372	478	531	637	743	849
RWY 28 PAR GS	3.80°	471	605	673	807	942	1076

Lighting - Refer to Airport Chart

TERPS

STRAIGHT-IN LANDING

	PAR 10 DA(H) 463′ (387′)		PAR 28 DA(H) 1307′ (1237′)		ASR 10 MDA(H) 600′ (524′)		ASR 28 MDA(H) 1180′ (1110′)	
		ALS out		ALS out		ALS out		ALS out
A	400′- V3/4	400′- V1 1/4	1300′- V3		600′- R40 or V3/4	600′- R55 or V1	1200′- R55 or V1	
B							1200′- R60 or V1 1/4	
C			NA		600′- R55 or V1	600′- V1 1/2	1200′- V3	
D								

1 CIRCLE-TO-LAND

ASR

Max Kts	Runway 10 MDA(H)		Runway 28 MDA(H)	
90	940′ (864′)	900′- V1 1/4	1180′ (1104′)	1200′- V1 1/4
120	1000′ (924′)	1000′- V1 1/4	1180′ (1104′)	1200′- V1 1/2
140	1240′ (1164′)	1200′- V3	1240′ (1164′)	1200′- V3
165	1460′ (1384′)	1400′- V3	1460′ (1384′)	1400′- V3

TERPS

1 Circling not authorized North of Rwy 10-28.

CHANGES: Aerodrome name revised.

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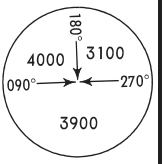
BRIEFING STRIP™

ATIS	PRESTWICK Approach	PRESTWICK Radar	PRESTWICK Tower
121.130	129.450	129.450	118.150

RADAR	Final Apch Crs	5.0 NM RADAR FIX	DA/MDA(H)	Apt Elev 65′
	123°	1600′(1562′)	570′(532′)	Rwy 38′

MISSED APCH: Continuous climb to 3000′: initially climb STRAIGHT AHEAD to 2500′, then turn RIGHT to Lctr and hold at 3000′ or as directed. MAX 210 KT.

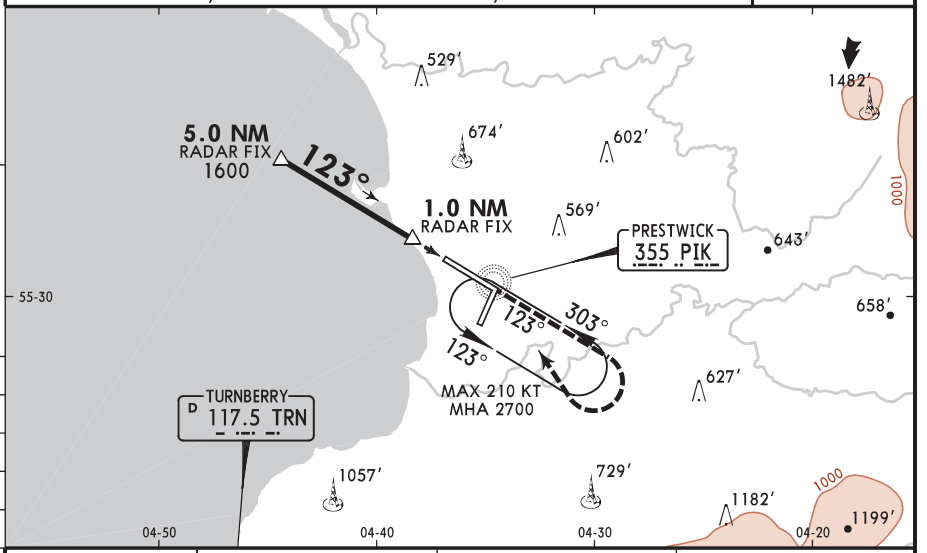
UNABLE TO RECEIVE NDB: Climb on Rwy hdg to 3000′, then climbing turn RIGHT to TRN VOR and hold at 6000′, or as directed by ATC.



MSA PIK Lctr

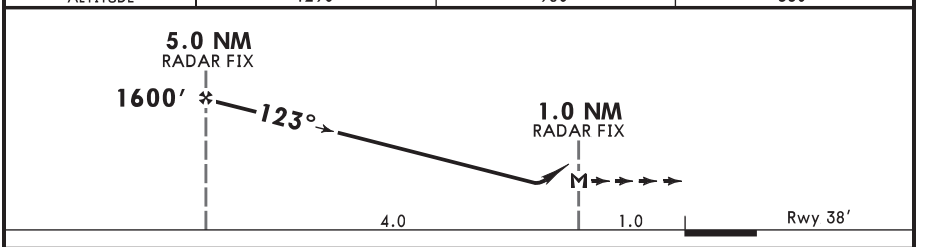
Alt Set: hPa | Rwy Elev: 1 hPa | Trans level: By ATC | Trans alt: 6000′

151



1 in=5 NM

RADAR FIX	4.0	3.0	2.0
ALTITUDE	1290′	980′	660′



Gnd speed-Kts		70	90	100	120	140	160
Descent Angle	2.94°	364	468	520	624	728	832
MAP 1 NM from touchdown or TMN 2 to MAP	1.0	0:51	0:40	0:36	0:30	0:26	0:23

HIALS
PAPI

Refer to Missed Apch above

Std/State STRAIGHT-IN LANDING

CDFA
[1] DA/MDA(H) **570′**(532′)
ALS out

A	R1500m	
B		
C	R1700m	R2400m
D		

CIRCLE-TO-LAND

Southwest of Rwy 12/30

Max Kts	MDA(H)		MDA(H)	
100	750′(685′)	V1500m	800′(735′)	V1500m
135	870′(805′)	V1600m	900′(835′)	V1600m
180	1000′(935′)	V2400m	1100′(1035′)	V2400m
205	1070′(1005′)	V3600m	1100′(1035′)	V3600m

[1] VNAV DA(H) in lieu of MDA(H) depends on operator policy.

PANS OPS

CHANGES: Minimums, SRA Rwy 21 moved to 18-2, SRA Rwy 30 moved to 18-3.

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BRIEFING STRIP™

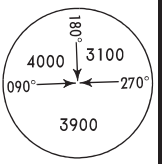
ATIS	PRESTWICK Approach	PRESTWICK Radar	PRESTWICK Tower
121.130	129.450	129.450	118.150

RADAR	Final Apch Crs	5.0 NM RADAR FIX	DA/MDA(H)	Apt Elev 65′
	205°	2000′(1940′)	850′(790′)	Rwy 60′

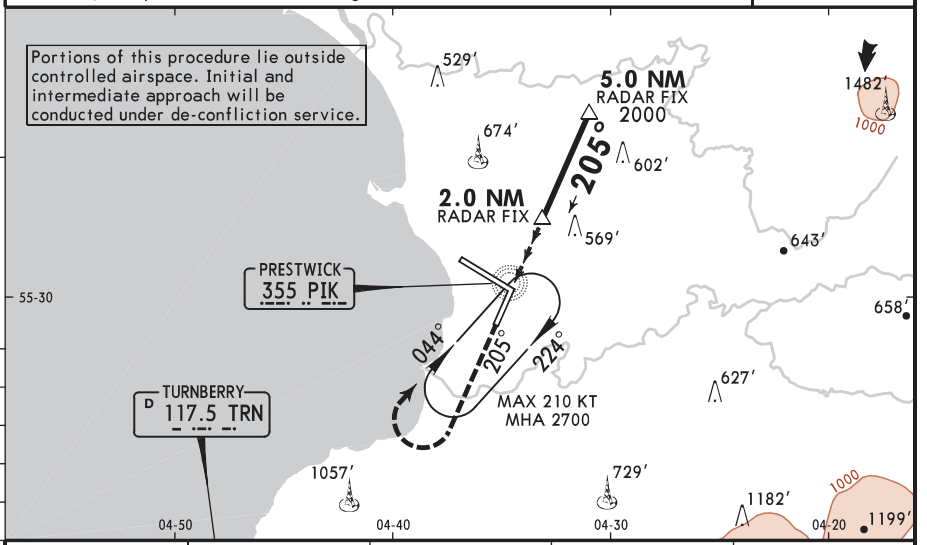
MISSED APCH: Continuous climb to 3000′: initially climb STRAIGHT AHEAD to 2500′, then turn RIGHT to Lctr and hold at 3000′ or as directed. MAX 210 KT.
UNABLE TO RECEIVE NDB: Route direct to TRN VOR to 6000′ to hold or as directed by ATC.

Alt Set: hPa Rwy Elev: 2 hPa Trans level: By ATC Trans alt: 6000′

WARNING: Do not descend below procedure minimum altitudes, nor extend outbound tracks beyond specified values due to high terrain.

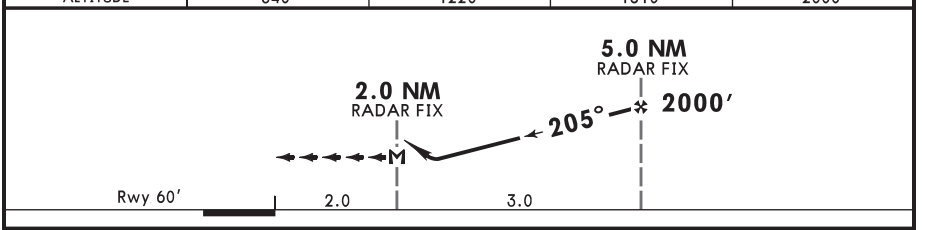


MSA PIK Lctr



1 in=5 NM

RADAR FIX	2.0	3.0	4.0	5.0
ALTITUDE	840′	1220′	1610′	2000′



Gnd speed-Kts		70	90	100	120	140	160
Descent Angle	3.66°	453	583	648	777	907	1036
MAP at termination point							

HIALS
PAPI

Refer to Missed Apch above

Std/State STRAIGHT-IN LANDING

CDFA
[1] DA/MDA(H) **850′**(790′)
ALS out

A	R1500m
B	
C	R2400m
D	

CIRCLE-TO-LAND

Max Kts	Southwest of Rwy 12/30 MDA(H)		MDA(H)	
100	850′(785′)	V1500m	850′(785′)	V1500m
135	870′(805′)	V1600m	900′(835′)	V1600m
180	1000′(935′)	V2400m	1100′(1035′)	V2400m
205	1070′(1005′)	V3600m	1100′(1035′)	V3600m

[1] VNAV DA(H) in lieu of MDA(H) depends on operator policy.

PANS OPS

CHANGES: New chart.

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EGPK/PIK PRESTWICK

JEPPESEN

1 MAR 24 (18-3)

PRESTWICK, UK

TMN 2.0 SRA Rwy 30

BRIEFING STRIP™

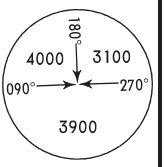
ATIS	PRESTWICK Approach	PRESTWICK Radar	PRESTWICK Tower
121.130	129.450	129.450	118.150

RADAR	Final Apch Crs	5.0 NM RADAR FIX	DA/MDA(H)	Apt Elev 65′
	303°	2000′(1935′)	760′(695′)	Rwy 65′

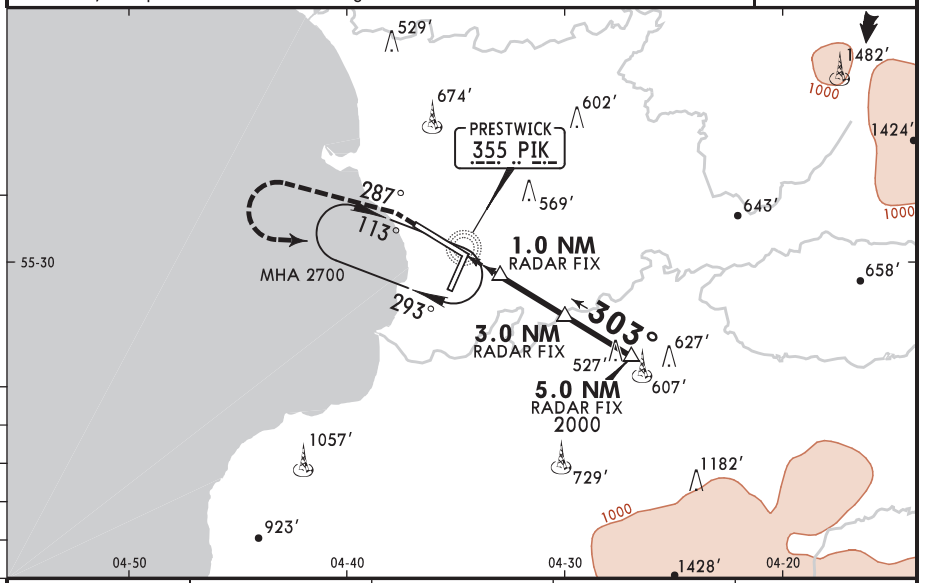
MISSED APCH: Continuous climb to 3000′: initially climb STRAIGHT AHEAD to 1300′, then turn LEFT onto track 287° continuing to 2500′ then climbing turn LEFT to Lctr and hold at 3000′ or as directed.

Alt Set: hPa Rwy Elev: 2 hPa Trans level: By ATC Trans alt: 6000′

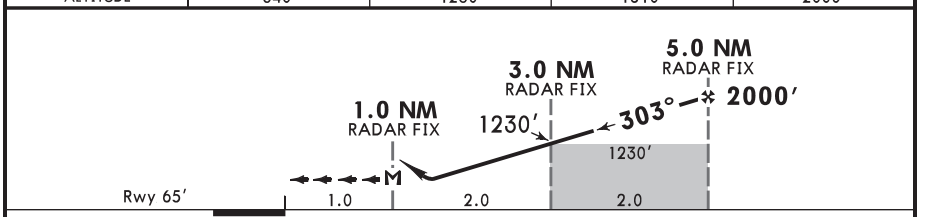
WARNING: Do not descend below procedure minimum altitudes, nor extend outbound tracks beyond specified values due to high terrain.



MSA PIK Lctr



RADAR FIX	2.0	3.0	4.0	5.0
ALTITUDE	840′	1230′	1610′	2000′



Gnd speed-Kts		70	90	100	120	140	160
Descent Angle	3.64°	451	580	644	773	902	1031
MAP 1 NM from touchdown							

HIALS
PAPI

Refer to Missed Apch above

Std/State STRAIGHT-IN LANDING

CDFA
1 DA/MDA(H) 760′(695′)
ALS out

A	R1500m
B	R1500m
C	R2400m
D	R2400m

CIRCLE-TO-LAND

Max Kts	Southwest of Rwy 12/30 MDA(H)		MDA(H)	
100	760′(695′)	V1500m	800′(735′)	V1500m
135	810′(745′)	V1600m	900′(835′)	V1600m
180	1070′(1005′)	V2400m	1100′(1035′)	V2400m
205	1070′(1005′)	V3600m	1100′(1035′)	V3600m

PANS OPS

1 VNAV DA(H) in lieu of MDA(H) depends on operator policy.

CHANGES: New chart.

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BRIEFING STRIP™

D-ATIS Arrival (NE)	(SW)	NEW YORK Approach (R)	KENNEDY Tower	Ground
128.72 117.7	115.4	128.125	119.1 (Rwys 4R/22L & 13L/31R) 123.9 (Rwys 4L/22R & 13R/31L)	121.9

NAVAIDS- See Planview	Final Apch Crs Refer to Planview	No FAF	CEIL-VIS **3500-5**	Apt Elev 14'

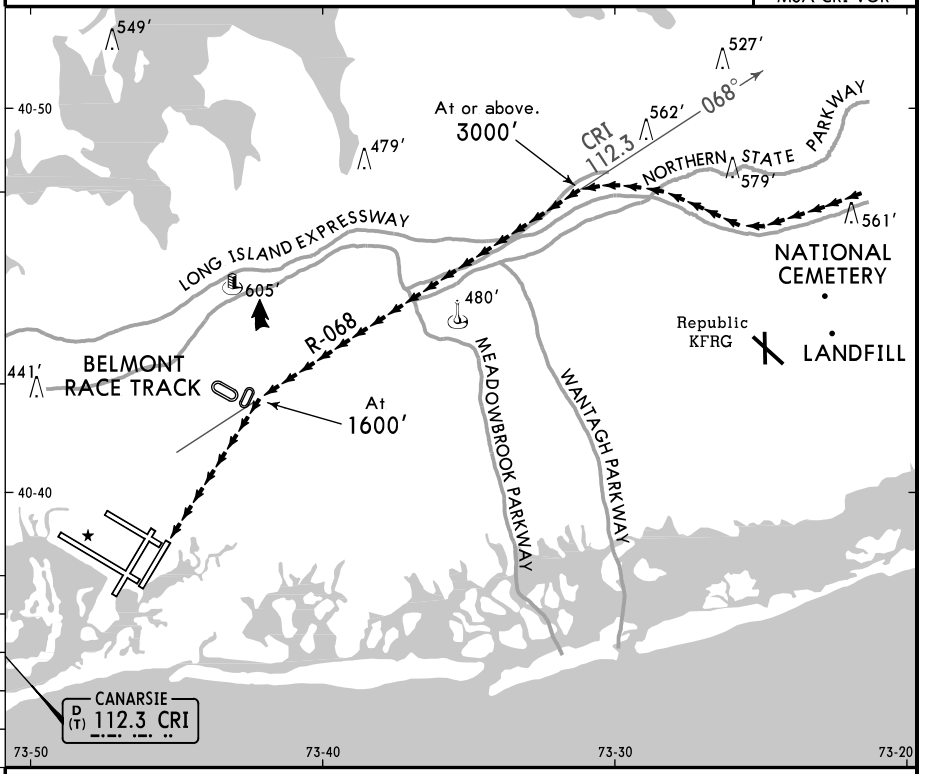
MISSED APCH: No missed approach procedure.

Alt Set: INCHES Trans level: FL 180 Trans alt: 18000'

1. Radar required. 2. Rwy 22L Vertical Guidance Navaid and Angle: PAPI-L 3.00°.

MSA CRI VOR: 2800 (090°–210°), 1800

153



BELMONT VISUAL RUNWAY 22L

When cleared for the Belmont Visual Approach to Rwy 22L, follow the Long Island Expressway WESTBOUND until intercepting CRI R-068 at 3000'. Navigate on CRI R-068 till abeam Belmont Race Track at 1600'. Remain EAST of Belmont Race Track and proceed direct to JFK Rwy 22L.

ALSF-II
PAPI

TERPS AMDTO

WEATHER MINIMUMS

Ceiling **3500'**- VIS 5

CHANGES: None.

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PARKWAY VISUAL Rwy 13L/R

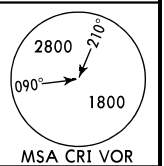
D-ATIS Arrival (NE)	(SW)	NEW YORK Approach (R)	KENNEDY Tower		Ground
128.72	117.7 115.4	128.125	119.1 (Rwys 4R/22L & 13L/31R) 123.9 (Rwys 4L/22R & 13R/31L)		121.9

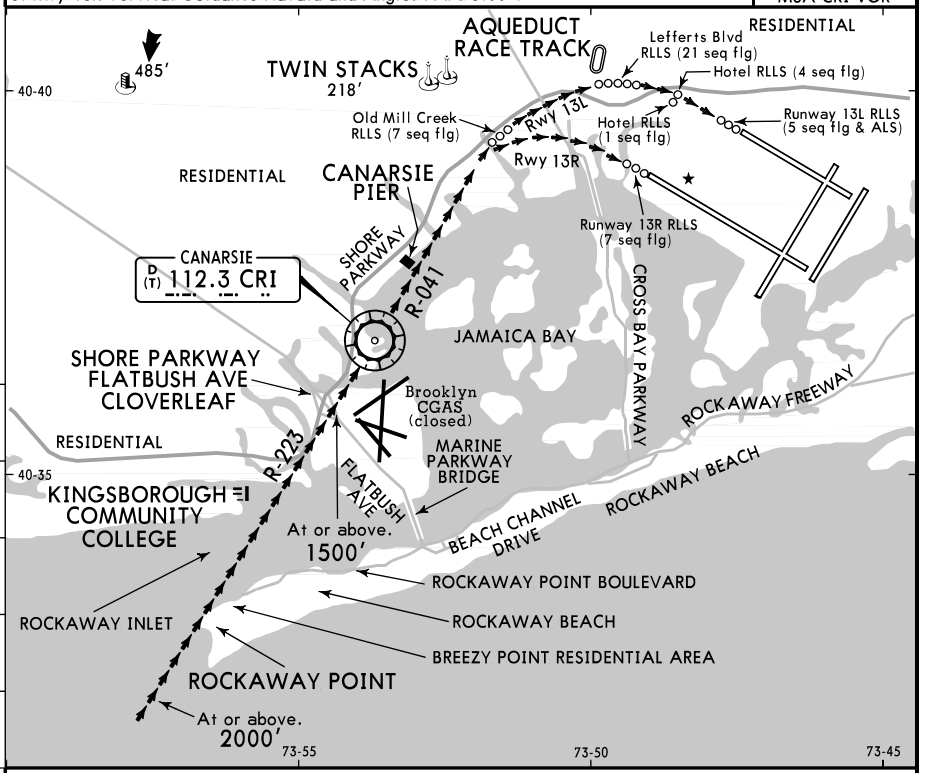
NAVAIDS- See Planview	Final Apch Crs Refer to Planview	No FAF	CEIL-VIS 2500-3	Apt Elev 14′

MISSED APCH: No missed approach procedure.

Alt Set: INCHES Trans level: FL 180 Trans alt: 18000′

1. Radar required.
2. Rwy 13L Vertical Guidance Navaid and Angle: PAPI-L 3.00°.
3. Rwy 13R Vertical Guidance Navaid and Angle: PAPI 3.00°.





PARKWAY VISUAL RWY 13L/R

When cleared for Parkway Visual to Rwy 13L/R, maintain at or above 2000′ until abeam Rockaway Point. Remain WEST of Rockaway Point, thence EAST of Kingsborough Community College. Remain EAST of the Shore Parkway. Cross Brooklyn Coast Guard Air Station at or above 1500′. Remain EAST of the Shore Parkway until Canarsie Pier.

Runway 13R continue descent between the Canarsie Pier and the Twin Stacks.

Runway 13L continue descent after passing the Twin Stacks.

Rwy 13L	Rwy 13R
ALSF-II PAPI RLLS	PAPI RLLS

WEATHER MINIMUMS

Ceiling **2500′**-VIS 3

BRIEFING STRIP™ 1 in=2.5 NM TERPS AMEND 1 29 MAY 2014

CHANGES: Lighting.

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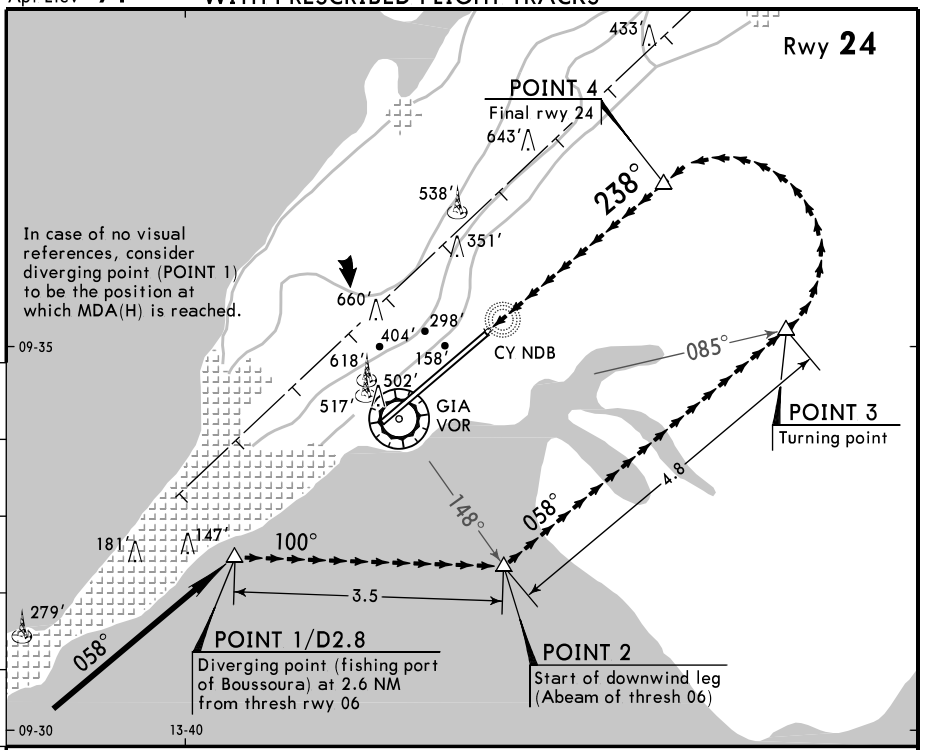
CIRCLE-TO-LAND WITH PRESCRIBED FLIGHT TRACKS

Apt Elev **71'**



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Std/State

Prohibited North of runway

	Max Kts.	MDA(H)	
A	100	**960'**(889')	V1600m
B	135	**960'**(889')	V2000m
C	180	**1060'**(989')	V2800m
D	205	**1060'**(989')	V3600m

CHANGES: Airport name. New AOM concept.

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JEPPESEN

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AAMEDU
February 2024