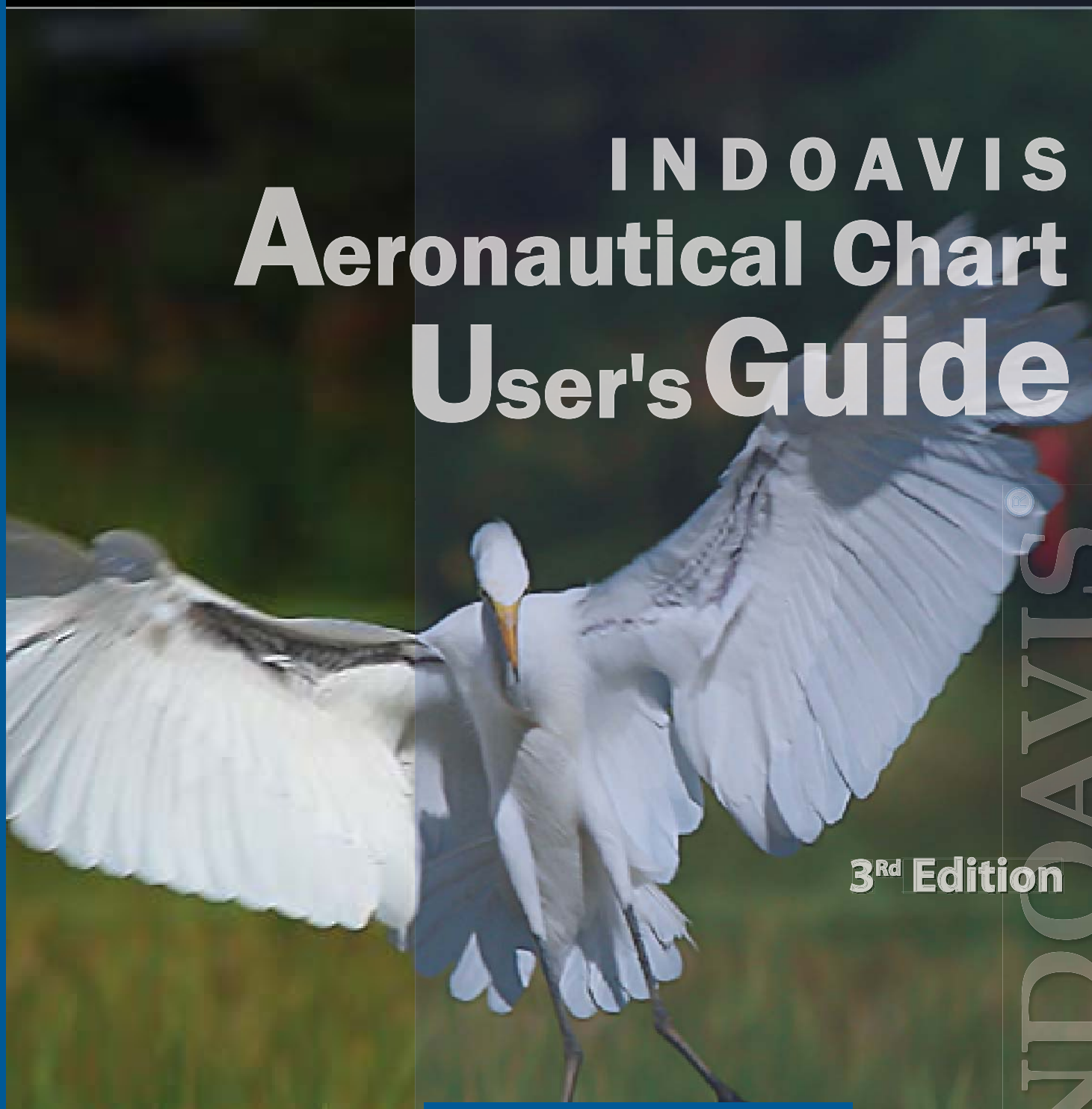
PT. INDOAVIS NUSANTARA

INDOAVIS Aeronautical Chart User's Guide



3Rd Edition

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Geo-informatic and Aeronautical Navigation Services

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INDONESIA

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This Manual has been developed to meet the need for a publication providing current information in the condensed form required for modern air navigation under instrument and visual flight conditions. Information contained in the copyrighted charts is independently available from publications of the appropriate governing authority.

It is designed for use by experienced, instrument-rated pilots who must be thoroughly familiar and competent with the instrument navigation of aircraft.

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In addition, this Manual, including all subsequent revisions, contains a wide variety of information useful to pilots which Indoavis has obtained from many outside sources. Indoavis has edited this source material, and arranged and published it in a convenient, easy-to-use communicates the information obtained from this source material.

INTRODUCTION TO INDOAVIS AERONAUTICAL NAVIGATION CHARTS USER'S GUIDE

2013

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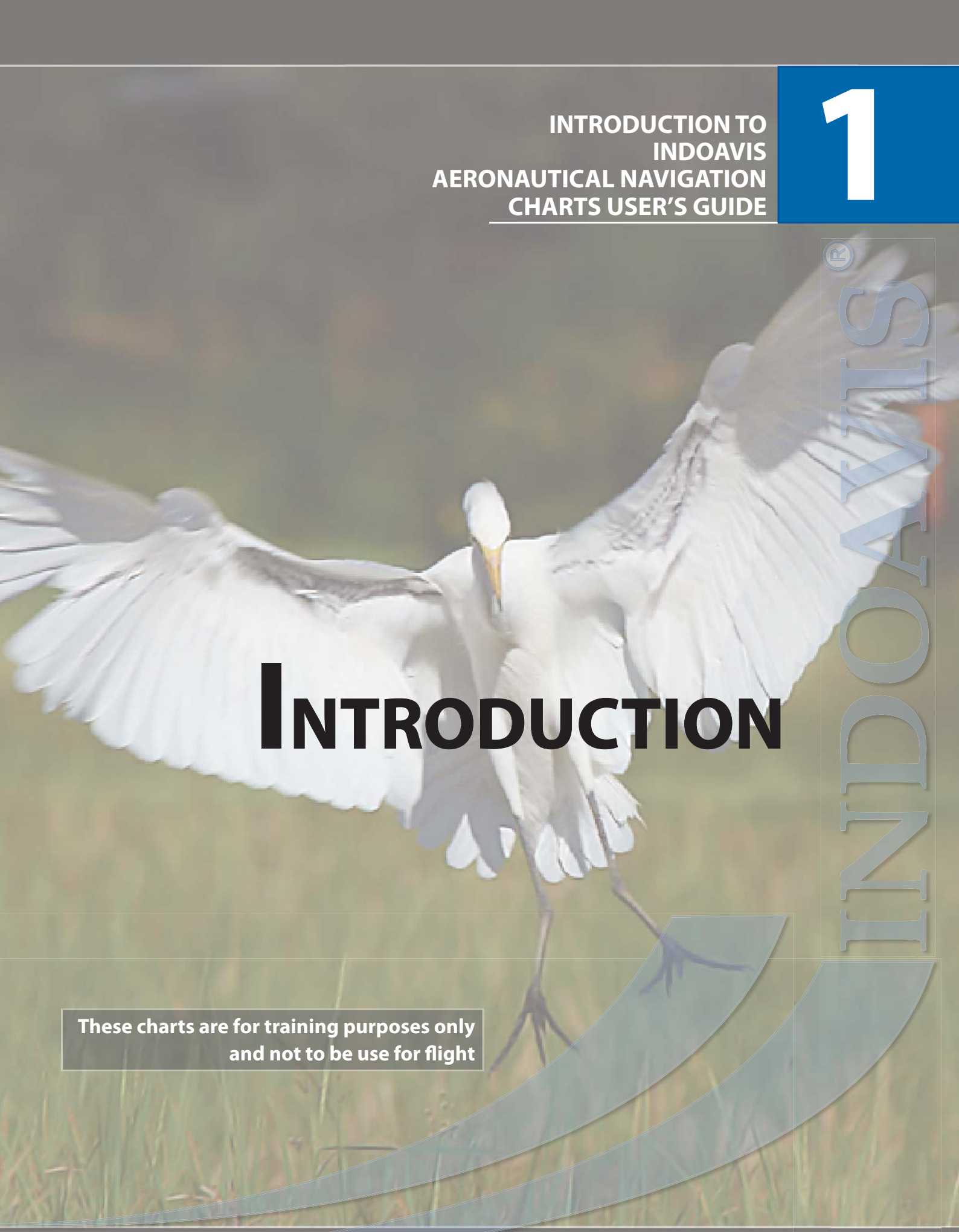

INTRODUCTION

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DOC NO: INDOAVIS.UG.0I/III/2009

English Version

INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

Edition: III – 2013

INDOAVIS
AERONAUTICAL NAVIGATION CHART
USER'S GUIDE

INTRODUCTION

This Chart User's Guide is intended to serve as a learning aid, reference document and an introduction to the wealth of information provided on aeronautical charts and publications of from PT. INDOAVIS NUSANTARA.

This guide can also serve as a basic reference of chart information for experienced pilots. Indoavis publishes charts for each stage of VFR (Visual Flight Rules), IFR (Instrument Flight Rules) and Terminal Navigation, including training, planning, departure, en-route (low and high altitude), approach, and taxiing.

A description of the charts, other aeronautical products and ordering instructions are included in Indoavis Aeronautical Chart Users Guide, available free.

USING CURRENT CHARTS

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

To make certain a chart or publication is current, refer to the next scheduled edition date printed on the cover. Pilots should also consult Aeronautical Chart Bulletins or see the Indoavis Website (www.indoavis.co.id) Chart Revicion and NOTAMs for changes essential to the safety of flight that may occur during the effective dates of a chart or publication.

The Notices to Airmen Publication includes current Flight Data Center NOTAMs, which are regulatory in nature and primarily reflect changes to Standard Instrument Approach Procedures, flight restrictions, and aeronautical chart revisions. This publication is prepared every 28 days by indoavis, and is available by subscription product Airnav Manual.

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

The chart training guide is published as a service for pilots training with Indoavis charts. It is intended for reference only and includes some of the most commonly used symbology. Not all symbology is included with this guide. This guide is revised regularly; however, some variance may exist between this guide and current chart services.

These may be the result of one or more of the following: chart issuance dates, timely application of changes received from governing agencies (DGCA) and / or the method of representing such information. Some of the charts used in this guide are based on a fictitious location. The chart training guide has been designed as supplementary training material and is not intended for navigation.

DIFFERENCE CHART INFORMATION

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

extent possible. You, the pilot, are a valuable source of information.

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

CORRECTIONS, COMMENTS

FOR CHART ERRORS,
OR FOR CHANGES, ADDITIONS
RECOMMENDATIONS ON PROCEDURAL ASPECTS PLEASE CONTACT:

For complete product information regarding coverage's, services, and pricing, please contact:

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DOCUMENT IDENTIFICATION SHEET

DOCUMENT DESCRIPTION

INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

Volume III - 2013

This document is published to provide guidance and services in understanding to the product Indoavis aeronautical maps for the purpose of reference to the introduction of use symbols, and this document will always be renewed under the provisions of applicable indoavis and in every country mapped by Indoavis. This guidance document is created as an additional practice material and is not intended for navigation.	*Dokumen ini di buat untuk memberikan panduan dan layanan dalam memahami produk peta-peta Aeronautika indoavis dengan maksud untuk sebagai referensi guna pengenalan istilah dan simbol-simbol yang digunaka. Dokumen ini akan selalu di perbaharui berdasarkan ketentuan yang berlaku di indoavis dan disetiap Negara yang dipetakan oleh Indoavis. Dokumen panduan ini dibuat sebagai bahan latihan tambahan dan tidak dimaksudkan untuk digunakan terbang navigasi.*

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DOCUMENT CHANGE RECORD

Edition	Date	Reason For Change	Sectional Page
1	14 Feb 2003	Base Document	All
2	14 Sep 2005	Abbreviation	All
3	10 Jan 2009	Final to Introduction (Glossary and Abbreviation)	All
4	10 Jan 2011	Airspace Classification	4.4
5	11 Oct 2011	VFR Aeronautical Navigation chart	4.1 / 4.12
6	13 Feb 2013	SID/STAR	7.1 / 7.10
7	02 Apr 2013	Miscellaneous	9.1/9.7
8	20 Apr 2013	Cover	All

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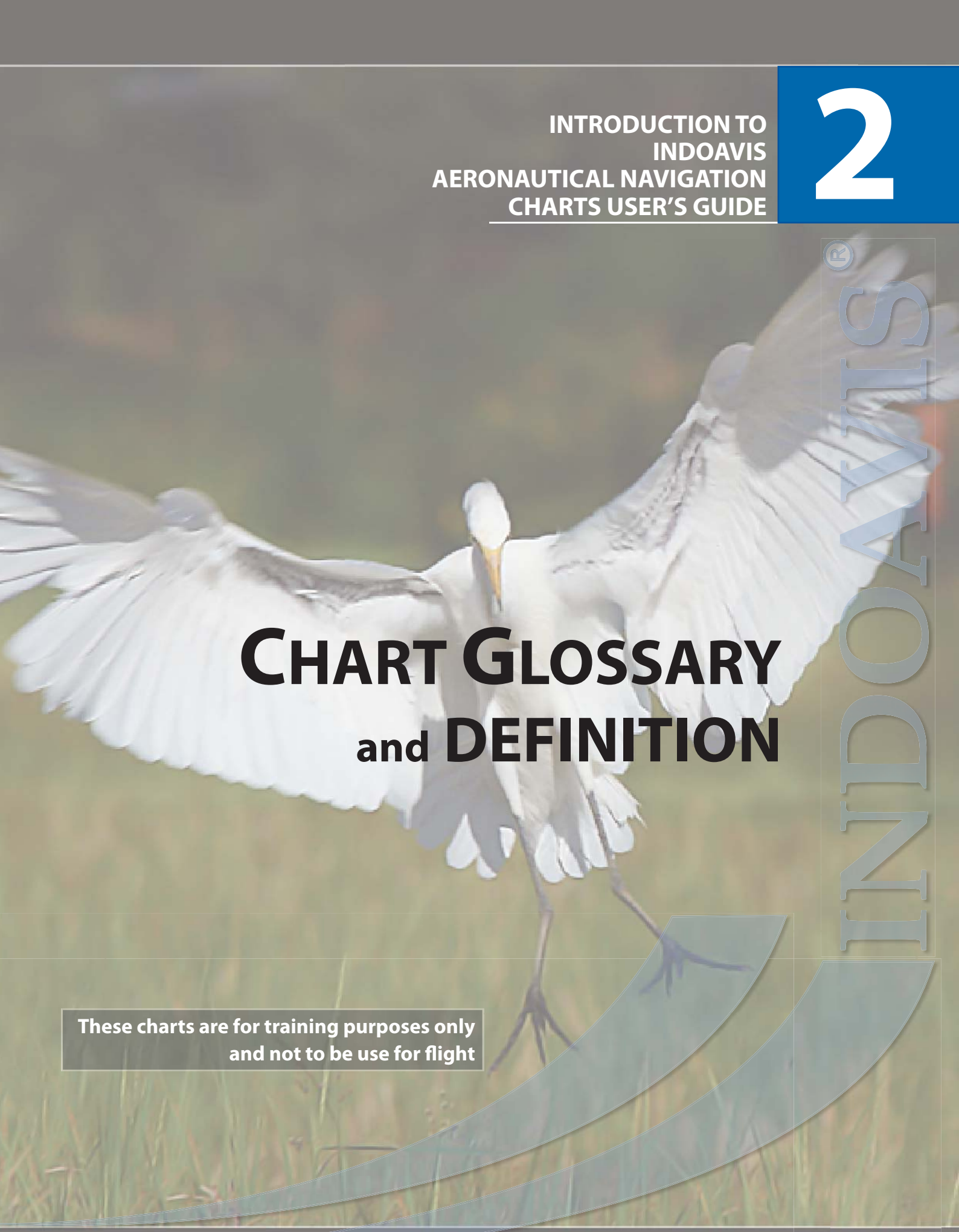

CHART GLOSSARY and DEFINITION

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INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

English Version

CHART GLOSSARY AND DEFINITION

CHART GLOSSARY AND DEFINITION

AERONAUTICAL CHART — A representation of a portion of the Earth, its culture and relief, specifically designated to meet the requirements of air navigation.

In INDOAVIS Aeronautical Chart into three groups, each group is adjusted to the utilizations. As for the grouping as follows:

1. **TERMINAL AERONAUTICAL CHART**
   a. CIVIL AIRNAV MANUAL
   b. MILITARY AIRNAV MANUAL (FLIPS)
   c. HELICOPTER AIRNAV MANUAL
   d. AIRPORT FACILITY/DIRECTORY

2. **IFR (INSTRUMENT) AERONAUTICAL CHART**
   a. EN-ROUTE CHART (High & Low Altitude)
   b. SAFETY ROUTE CHART (low Altitude)

3. **VFR (VISUAL) AERONAUTICAL CHART**
   a. WAC-ICAO (World Aeronautical Chart) 1:1.000.000
   b. ONC (Operational Navigation Chart) 1:1.000.000
   c. SAC (Sectional Aeronautical Chart) 1:500.000
   d. TRA (Training Area Chart) 1:250.000
   e. HRC (Helicopter Routing Chart) 1:50.000

ICAO Aeronautical chart series available
Civil Aviation Administration, the Aeronautical Information Service and the sales agents have copies of the ICAO Aeronautical Chart Catalogue (Doc 7101) where all aeronautical charts or chart series produced by this and other countries are listed, and known to be generally available to civil aviation

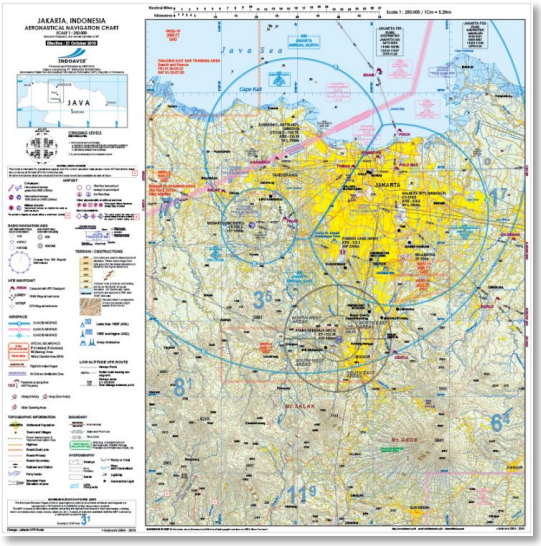
The following ICAO series of aeronautical charts are produced:

1. World Aeronautical Chart - ICAO 1:1.000.000
2. Plotting Chart - ICAO
3. Aerodrome heliport Chart - ICAO
4. Aerodrome Ground Movement Chart - ICAO
5. Aircraft Parking Docking Chart - ICAO
6. Aerodrome Obstacle Chart - ICAO - Type A
7. Aerodrome Obstacle Chart - ICAO - Type C
8. Precision Approach Terrain Chart- ICAO (precision approach Cat II)
9. En-route Chart - ICAO
10. Area Chart - ICAO (arrival and transit routes)
11. Area Chart - ICAO (departure and transit routes)
12. Standard Departure Chart - Instrument (SID) -ICAO
13. Standard Arrival Chart - Instrument (STAR) -ICAO
14. Instrument Approach Chart - ICAO (for each runway and procedure type)
15. Visual Approach Chart - ICAO. (for each runway)

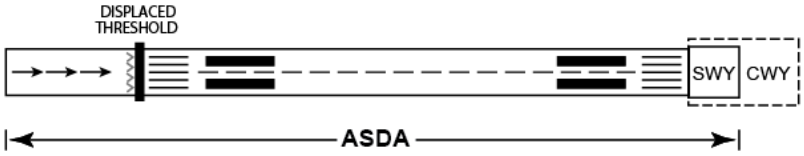
AERONAUTICAL NAVIGATION CHART (ANC) 1:250.000,- — Is the standard INDOAVIS small - scale aeronautical chart series. The ANC and other aeronautical navigation and planning charts provide essential cartographic data appropriate to scale, and are overprinted with stable aeronautical information such as obstructions, aerodromes, special use airspace, navigational aids, Maximum Elevation Figures (MEFs), and related data.

Chart function

1) serve as an air navigation aid for flight crews of long range aircraft at high altitudes;
2) provide selective checkpoints over extensive ranges for identification at high altitudes and speeds, which are required for visual confirmation of position;
3) provide for continuous visual reference to the ground during long range flights over areas Lock of radio or other electronic navigation aids, or over areas where visual navigation is preferred or becomes necessary;
4) provide a general purpose chart series for long range flight planning and plotting.



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



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

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

AERODROME (AD) — 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.

AERODROME ELEVATION (AD ELEV) — The elevation of the reference point of the landing area

AERODROME/HELIPORT CHART — This chart contains detailed aerodrome Heliport data to provide flight crews with information.

AERODROME OPERATING MINIMA - The limits of usability of an aerodrome for:

a) Take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;
b) Landing in precision approach and landing operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the category of the operation; and
c) Landing in approach and landing operations with vertical guidance, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H); and
d) Landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions.

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

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

AERODROME REFERENCE CODE — A simple method for interrelating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodromes facilities that are suitable for the aeroplanes that are intended to operate at the aerodrome. in the table below:

Code Element 1			Code Element 2	
Code Number	Aeroplane Reference Field Length	Code Letter	Wing Span	Outer Main Gear Wing Span (*)
(1)	(2)	(3)	(4)	(5)
1	Less than **800m**	A	Up to but not including 15m	Up to but not including 4.5m
2	**800m** up to but not including **1200m**	B	15m up to but not including 24m	4.5m up to but not including 6m
3	**1200m** up to but not including **1800m**	C	24m up to but not including 36m	6m up to but not including 9m
4	**1800m** and over	D	36m up to but not including 52m	9m up to but not including 14m
		E	52m up to but not including 65m	9m up to but not including 14m
		F	65m up to but not including 80m	14m up to but not including 16m
(*)Distance between the outside edges of the main gear wheels.				

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

AERODROME REFERENCE POINT (ARP) — The designated geographical location of an aerodrome.

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 INFORMATION CIRCULAR (AIC) — A notice containing information that does not qualify for the origination of a NOTAM or for inclusion in the AIP, but which relates to flight safety, air navigation, technical, administrative or legislative matters.

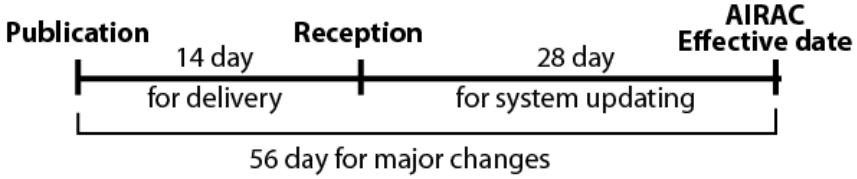
AIRPORT REFERENCE POINT (ARP) — A point on the airport designated as the official airport location.

AIP AMENDMENT (AMDT) — Permanent changes to the information contained in the AIP.

AIP SUPPLEMENT (SUPP) —Temporary changes to the information contained in the AIP which are published by means of special pages.

AIRAC — An acronym (aeronautical information regulation and control) signifying a system aimed at advance notification based on common effective dates, of circumstances that necessitate significant changes in operating practices.

AIRAC SCHEDULE — It may look indeed like a long period, 28 days, or even 56, but it should be understood that aeronautical information changes (mostly published through so called AIRAC Amendments) require.



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

Aircraft Category	Vat	Range of Speeds for Initial Approach	Range of Final Approach Speeds	Max speeds for Visual Maneuvering (Circling)	Maximum speed for Missed Approach	
					Intermediate	Final
A	< 91 kt 169 km/h	91/150 (110*) kt 165/335 (205) Km/h	70/100 kt 130/185 km/h	100 kt 185 km/h	100 kt 185 km/h	110 kt 205 km/h
B	91 / 121 kt 169 / 223 km/h	121 / 180 (140*) 220/335 (260*)	135 155/240	135 kt 250 km/h	130 kt 240 km/h	150 kt 280 km/h
C	121 / 141 kt 224 / 260 km/h	160 / 240 kt 295 / 445 km/h	180 kt 215/295 km/h	180 kt 335 km/h	160 kt 295 km/h	240 kt 444 km/h
D	141 / 166 kt 261 / 306 km/h	185 / 250 kt 345 / 465 km/h	205 kt 240/345 km/h	205 kt 380 km/h	185 kt 345 km/h	265 kt 490 km/h
E	166 / 211 kt 307 / 390 km/h	185 / 250 kt 345 / 220** km/h	240 kt 285/425 km/h	240 kt 445 km/h	230 kt 425 km/h	275 kt 510 km/h
H***	N/A	130/220	110/165	N/A	165	165

- Vat —Speed at threshold based on 1.3 times stall speed in the landing configuration at maximum certificated landing mass.
- *Maximum speed for reversal and racetrack procedures.
- NOTE: The speed table applies to the new ICAO approach procedures which are identifiable by the OCA(H) figures and the PANS-OPS notation on the lower left corner of the approach chart. Old ICAO approach procedures show an OCL instead of OCA(H). Deviations are listed in the Air Traffic Control section.
- *** Helicopter point-in-space procedures based on basic GNSS may be designed using maximum speeds of 120 KIAS for initial and intermediate segments and 90 KIAS on final and missed approach segments, or 90 KIAS for initial and intermediate segments and 70 KIAS on final and missed approach segments based on operational need. Refer to PANS-OPS, Volume II, Part IV, Chapter 1, “

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.

(Indonesia ADIZ Areas : S04°00’ E104°00, S04°00 E117°00 – S10°00’ E104°00, S10°00’ E117°00’)

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

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

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

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

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

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

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

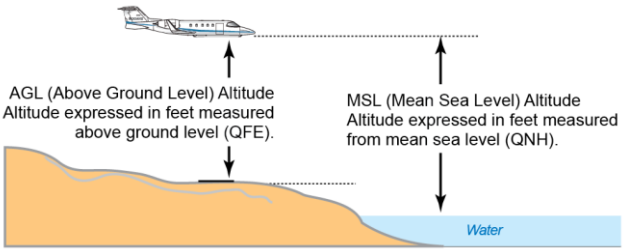
ALTERNATE AERODROME (ICAO) — An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing.

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

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).

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

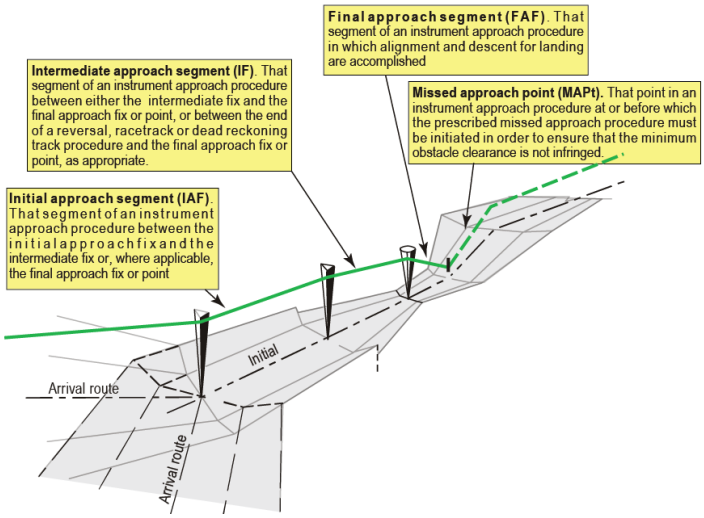
- Indicated Altitude — The Altitude as shown by an altimeter. On a pressure barometric altimeter instrument error and uncompensated for variation from standard atmospheric conditions.



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

APPROACH SEGMENTS — The Four Instrument approach segments are

1. Initial approach (IAF)
2. Intermediate approach (IF)
3. Final approach (FAF) and
4. Missed approach point (MAPt).



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

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

AREA MINIMUM ALTITUDE (AMA) — The lowest altitude to be used under instrument meteorological conditions (IMC) that will provide a minimum vertical clearance of 300 m (1.000 ft) or in designated mountainous terrain 600 m (2.000 ft) above all obstacles located in the area specified, rounded up to the nearest (next higher) 30 m (100 ft).

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

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

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

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

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

- AWOS-A Only reports altimeter setting.
- AWOS-1 Usually reports altimeter setting, wind data, temperature, dewpoint and density altitude.
- AWOS-2 Reports same as AWOS-1 plus visibility.
- AWOS-3 Reports the same as AWOS-2 plus cloud/ceiling data.

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

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.

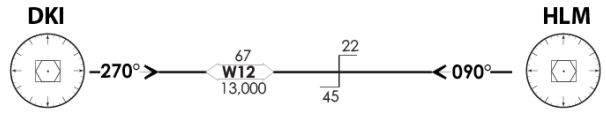
BRAKING ACTION (GOOD, FAIR, POOR, NIL) — A report of conditions on the airport movement area providing a pilot with a degree/quality of braking that might be expected. Braking action is reported in terms of good, fair, poor, or nil.

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

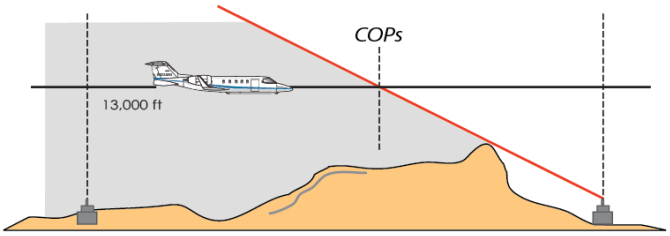
CATCH POINT — A fix/waypoint that serves as a transition point from the high altitude waypoint navigation structure to the low altitude structure or an arrival procedure (STAR).

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

CHANGEOVER POINTS — COP (Change Over Point) between two stations is indicated by mileages from the station to the point of change.



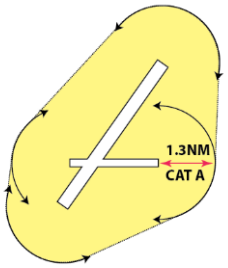
When flying airways, pilots normally change frequencies midway between navigation aids, although there are times when this is not practical. If the navigation signals cannot be received from the second VOR at the midpoint of the route, a changeover point (COP) is depicted and shows the distance in NM to each NAVAID,



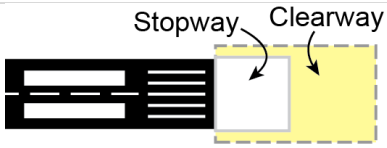
CIRCLING APPROACH — An extension of an instrument approach procedure which provides for visual circling of the aerodrome prior to landing

Visual Maneuvering Area for Circling Approach

Aircraft Category	Maneuvering Speed (kt)	Arc Radius
A	Speed to < 90	1.3 NM
B	91 to 120	1.5 NM
C	121 to 140	1.7 NM
D	41 to 165	2.3 NM
E	Speed over 165	4.5 NM



CLEARWAY (CWY) — A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aero-plane may make a portion of its initial climb to a specified height.



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

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

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

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

CONTROLLED AIRSPACE — An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification.
NOTE: Controlled airspace is a generic term which covers ATS airspace Classes “A”,“B” “C” “D”, and “E”.

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

CONTOUR LINE — A line on a map or chart connecting points of equal elevation, On Sectionals, Indoavis basic contours are spaced at 500' and 1000’ intervals.

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

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

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

NOTE:

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

DESCENT ANGLE PARAMETERS — The range of acceptable descent angles applicable to non-precision approaches is 2.75°(MINIMUM)-3.77° (MAXIMUM). The preferred range is 2.75°-3.50°. The OPTIMUM angle is 3.00°.

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

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

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

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

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 en-route structure to the initial approach fix (IAF).

FINAL APPROACH AND TAKE-OFF AREA (FATO) — A defined area over which the final phase of the approach maneuver 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 COURSE — A published MLS course, a straight line extension of a localizer, a final approach radial/bearing, or a runway centerline all without regard to distance.

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

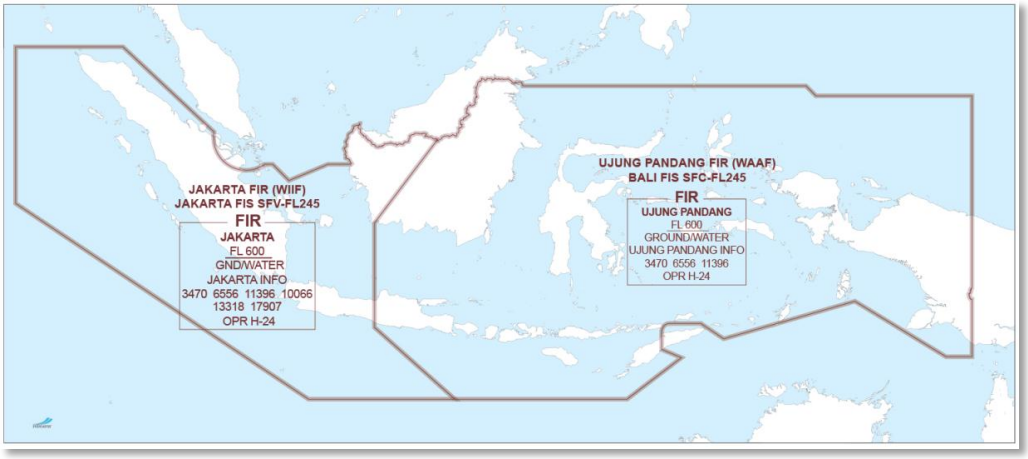
a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
b) at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:
   1) a landing can be made; or
   2) a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

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

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

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

a. Flight Information Service (FIS) — A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.
b. Alerting Service — A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.



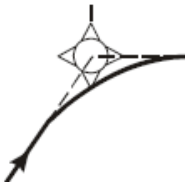
Indonesia (Jakarata FIR and Ujung Pandang FIR)

FLIGHT LEVEL (FL). — A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

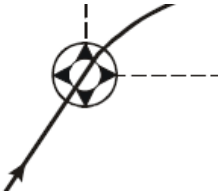
Note 1 - A pressure type altimeter calibrated in accordance with the Standard Atmosphere:
a) when set to a QNH altimeter setting, will indicate altitude;
b) when set to a QFE altimeter setting, will indicate height above the QFE reference datum;
c) when set to a pressure of 1 013.2 hPa, may be used to indicate flight levels.

Note 2 - The terms “height” and “altitude”, used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.

FLY-BY WAYPOINT —
A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure.

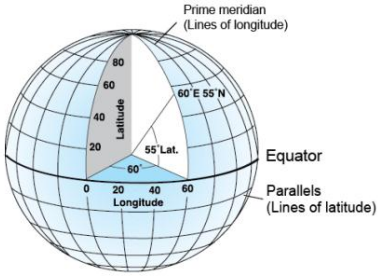


FLY-OVER WAYPOINT —
A waypoint at which a turn is initiated in order to join the next segment of a route or procedure.



GEODETIC DATUM — A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

GEOGRAPHICA COORDINATE (Position) — A geographic coordinate system (GCS) defines locations on the earth using a three-dimensional spherical surface. A GCS includes an angular unit of measure, a prime meridian, and a datum (based on a spheroid). A feature is referenced by its longitude and latitude values. Longitude and latitude are angles measured from the earth’s center to a point on the earth’s surface. The angles are measured in degrees (or in grads).



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

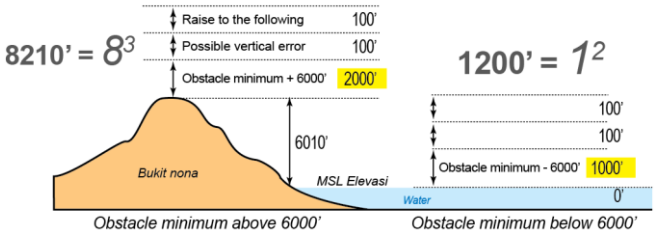
a. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS/MLS; or
b. Visual ground aids, such as VASI, which provide vertical guidance for a VFR approach or for the visual portion of an instrument approach and 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 INDOAVIS 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.

GRID MINIMUM OFFROUTE ALTITUDE (Grid MORA) — An altitude derived by INDOAVIS 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 navigation aid signal coverage or communication coverage.



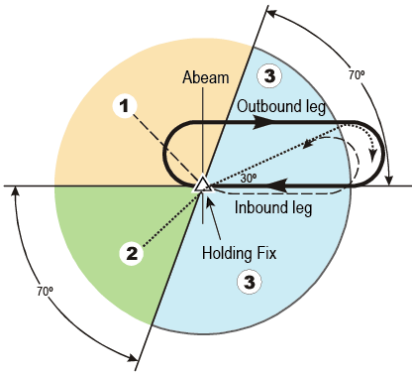
a. Grid MORA values derived by INDOAVIS clear all terrain and man-made structures by 1000 feet in areas where the highest elevations are 6000 feet MSL or lower. MORA values clear all terrain and man-made structures by 2000 feet in areas where the highest elevations are 6001 feet MSL or higher. When a Grid MORA is shown as "Un-surveyed" it is due to incomplete or insufficient information.

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.

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

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

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.



ENTRY HOLDING (RIGHT TURNS)

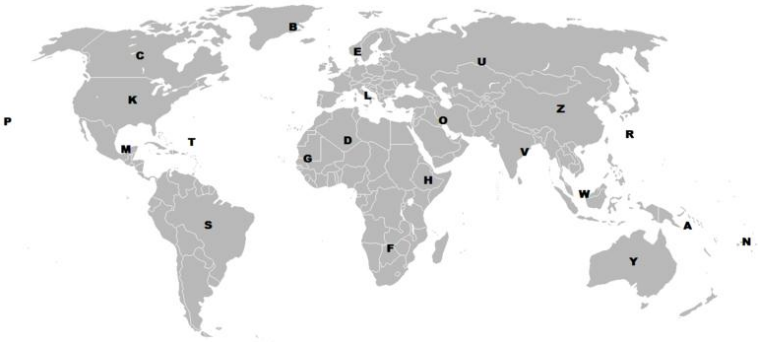
1. **Parallel Entry**
   - Upon reaching the fix, turn onto the outbound heading of the holding pattern for the appropriate period of time (1 minute or 1.5 minutes, depending on altitude)
   - Turn left to intercept the inbound track or return directly to the fix
   - On the second arrival over the fix, turn right and follow the holding pattern
2. **Offset Entry**
   - Upon reaching the fix, turn to a heading that results in a track having an angle of 30° or less from the inbound track reciprocal on the holding side
   - Continue for the appropriate period of time (1 or 1.5 minutes based on altitude), then turn right to intercept the inbound track and follow the holding pattern
3. **Direct Entry**
   Upon reaching the fix, turn right and follow the holding pattern

IATA AIRPORT CODE — An IATA airport code, also known an IATA location identifier, IATA station code or simply a location identifier, is a three-letter code designating many airports around the world, defined by the International Air Transport Association (IATA). The characters prominently displayed on baggage tags attached at airport check-in desks are an example of a way these codes are used.

Example IATA Code	
CGK	= Soekarno Hatta, Cengkareng
HLP	= Halim Perdana kusuma, Jakarta
SUB	= Juanda, Surabaya

ICAO AIRPORT CODE — airport code or location indicator is a four-letter alphanumeric code designating each airport around the world. These codes are defined by the International Civil Aviation Organization, and published in ICAO Document 7910: (*Location Indicators)*.

Example ICAO Code	
WIII	= Soekarno Hatta
WIHH	= Halim Perdana kusuma
WARR	= Juanda



Map of world regions classified according to the first letter of the ICAO airport code. (Indonesia is "W"

ICAO (INTERNATIONAL CIVIL AVIATION ORGANIZATION) — 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.

ICAO Headquarters, Montreal, Canada
International Civil Aviation Organization (ICAO)
999 University Street, Montréal, Quebec H3C 5H7, Canada
Tel.: +1 514-954-8219 Fax: +1 514-954-6077
E-mail: icaohq@icao.int
Web Support: web@icao.int - Customer Services: sales@icao.int

INDOAVIS (Indoavis Nusantara) — A specialized company of the Indonesia whose objective is to develop the techniques of Aeronautical air navigation services.
The first company in Indonesia which specializes in the field of geo-informatics and Aeronautical Navigation Support / Services

ILS (INSTRUMENT LANDING SYSTEM) CATEGORIES (ICAO) —

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

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

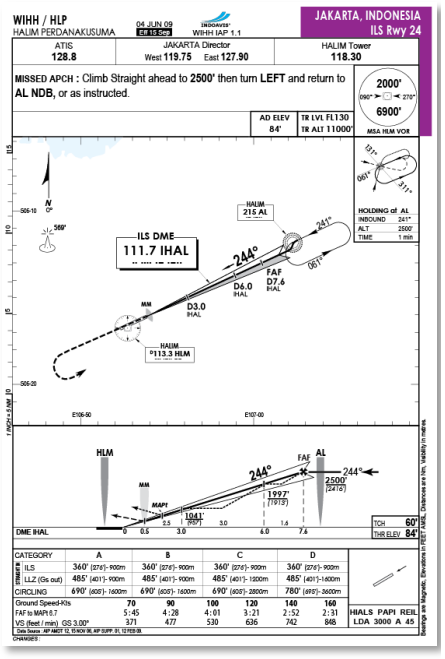
c. ILS Category III (Special authorization required)
   a. IIIA - An ILS approach procedure which provides for approach with either a decision height lower than 100ft (30m) or with no decision height and with a runway visual range of not less than 700ft (200m).
   b. IIIB - An ILS approach procedure which provides for approach with either a decision height lower than 50ft (15m) or with no decision height and with a runway visual range of less than 700 ft (200m) but not less than 150ft (50m).
   c. IIIC - An ILS approach procedure which provides for approach with no decision height and no runway visual range limitations.

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

INSTRUMENT APPROACH PROCEDURE (IAP)

A series of predetermined maneuvers 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:

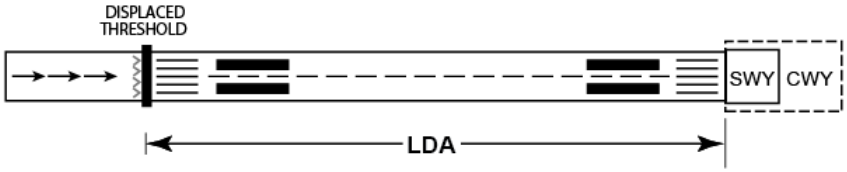
- Non-precision approach (NPA) procedure. An instrument approach procedure which utilizes lateral guidance but does not utilize vertical guidance.
- Approach procedure with vertical guidance (APV). An instrument approach procedure which utilizes lateral and vertical guidance but does not meet the requirements established for precision approach and landing operations.
- 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 ground-based navigation aid; or
  - computer-generated navigation data.



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.

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

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



LANDING MINIMA — The speed table related aircraft approach speeds to the rate of descent for ILS glide slope (descen in feet per minutes). For non-precision approach it related speed to the distance show from the final approach point (FAP) or other specified fix to the missed approach point (MAPt).

CATEGORY		A	B	C	D	
STRAIGHT IN	ILS	**360'** (276')- 900m	**360'** (276')- 900m	**360'** (276')- 900m	**360'** (276')- 900m	
	LLZ (Gs out)	**485'** (401')-900m	**485'** (401')-900m	**485'** (401')-1200m	**485'** (401')-1600m	
CIRCLING *MDA(H)*		**690'** (605')- 1600m	**690'** (605')- 1600m	**690'** (605')- 2800m	**780'** (695')- 3600m	
Ground Speed-Kts		70	90	100	120	140	160	HIALS PAPI REIL
FAP to MAPt 6.7		5:45	4:28	4:01	3:21	2:52	2:31	LDA 2800 A 45
VIS (feet / min) GS 3°		377	484	538	646	853	861	

Data Source : AIP AMDT 12, 14. 15 NOV 06.
Change: Jakarta Appch. Freq, Instr. Appch. Minima. © Indoavis 2008

A, B, C, D	Aircraft categories
ILS	ILS Decision altitude (DA)
LLZ (GS out)	Localizer approach (ILS without GS)
360'	Minimum Descent Altitude (MDA) MSL Altitude
(276')	LLZ-Height above Runway at minimum Descent Altitude (HAT Height Above Touchdown)
- 900m	Ground Visibility in metres or kilometre
CIRCLING	Circling landing minimum application for all runway
MDA(H)	Minimum Descen Altitude (Hight)
FAP / FAF	Beginning of final approach segment (precision approach) FAP (ICAO) / FAF (US)
VIS	Visibility
RVR	Runway Visual Range

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

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

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

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

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

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

MANDATORY FREQUENCY (MF) — A frequency designated at selected airports that are uncontrolled during certain hours only. Aircraft operating within the designated MF Area, normally 5 NM radius of the

airport, must be equipped with a functioning radio capable of maintaining two-way communications. INDOAVIS charts list the MF frequency and the area when other than the standard 5 NM.

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

MARKING — A symbol or group of symbols displayed on the surface of the movement area in order to convey aeronautical information.

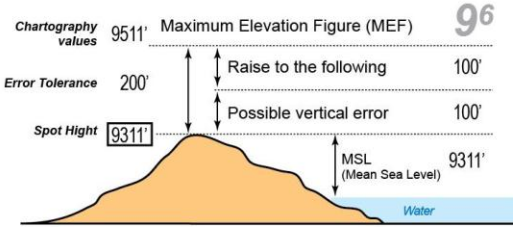
MAXIMUM AUTHORIZED ALTITUDE (MAA) — A published altitude representing the maximum usable altitude or flight level for an airspace structure or route segment.

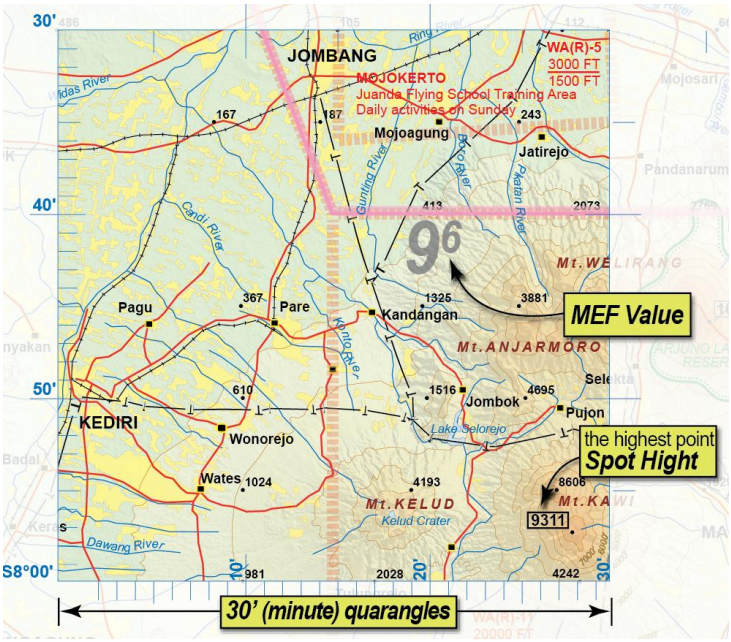
MAXIMUM ELEVATION FIGURE (MEF)

MEF is The Maximum Elevation Figure shown in quadrangles bounded by ticked lines of latitude and longitude are represented in THOUSAND & HUNDREDS of feet above mean sea level.

Example 9311 feet 96

The MEF is based on information available concerning the highest known feature and additional of (Possible vertical error and raise to the following 100 feet level) in each quadrangle, including terrain and obstructions (trees, towers, antennas, etc). In areas of extensive unreliable relief the MEF is shown by a note spread across the area

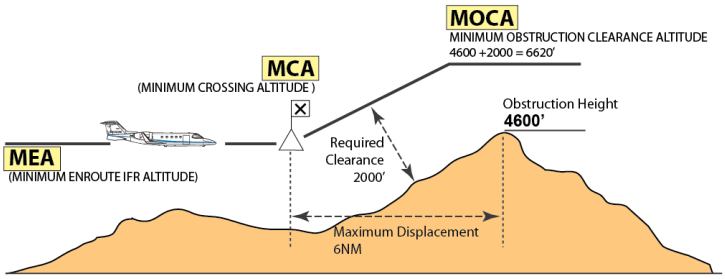




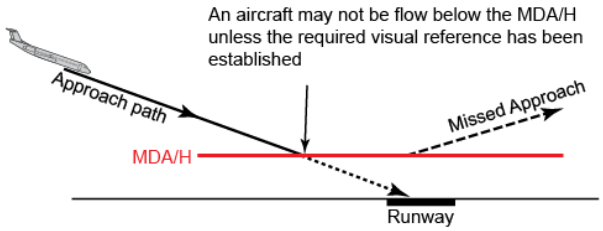
Examples of Indoavis SAC (Sectional Navigation Chart) Scale 1:500.000 map in one quadrant of latitude longitude coordinates of lines each 30' Minutes and for ONC (Operational Navigation Chart) Scale 1:1.000.000 quadrant of latitude longitude coordinates of lines each 1° Degree

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

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



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



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

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

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

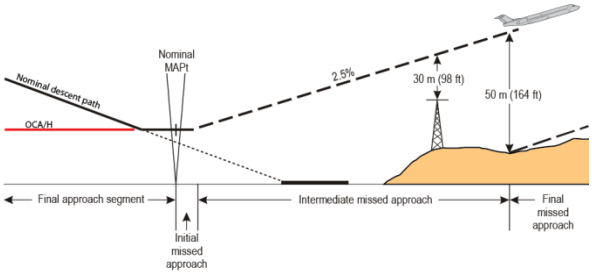
MINIMUM RECEPTION ALTITUDE (MRA) — The lowest altitude at which an intersection can be determined.

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

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

MISSED APPROACH 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.

a. A manoeuver 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.
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.



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

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

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

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

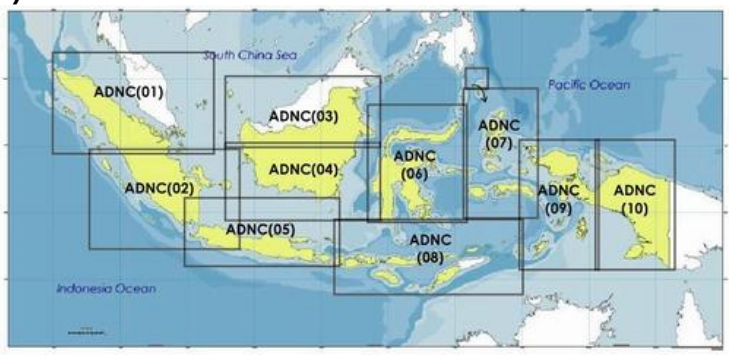
- ***Note 1.—*** *Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. 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 LIMITATION SURFACE (OLS) — The Obstacle Limitation Surfaces (OLS) are a series of surfaces that define the limits to which objects may project into the airspace.
The OLS comprises the following:

- Transitional surface
- Approach surface/ Take-off climb surface
- Inner horizontal surface
- Conical surface
- Outer horizontal surface
- Inner approach surface
- Inner transitional surface
- Balked landing surface

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 NAVIGATION CHART (ONC) — The ONC is the standard worldwide small- scale (1: 1,000,000) aeronautical chart series, and contains cartographic data with an aeronautical overprint depicting obstructions, aerodromes, special use airspace, navigational aides, Maximum Elevation Figures (MEFs), and related data. Because of scale, some features, including obstructions, are generalized in developed regions. Designed for medium altitude high- speed visual and radar navigation



Coverage of the Indoavis Operational Navigation Charts for Indonesia and surrounding countries

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

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

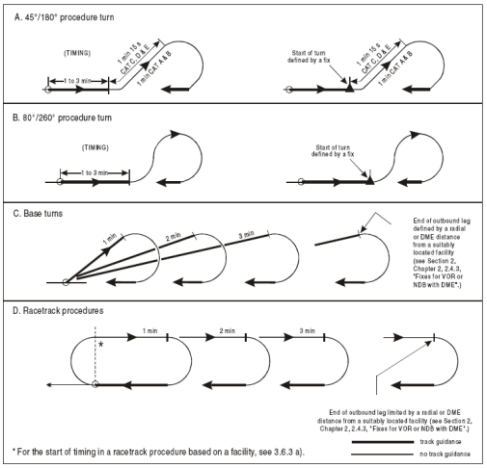
PROCEDURE ALTITUDES — Are recommended altitudes developed in coordination with Air Traffic Control requirements to accommodate a stabilized descent profile on a prescribed descent angle on the final approach course and sometimes also in the intermediate approach segment. Procedure altitudes are never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

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

NOTE:

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

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



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

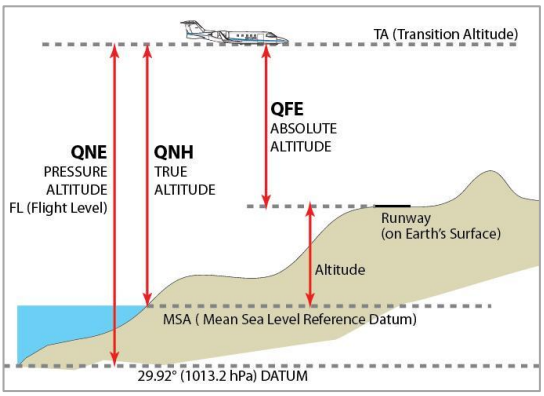
PROCEDURE TURN INBOUND — That point of a procedure turn manoeuver where course reversal has been completed and an aircraft is established inbound on the intermediate approach segment or final approach course. A report of "procedure turn inbound" is normally used by ATC as a position report for separation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

PROHIBITED AREA — An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

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

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

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



Quality assurance — All the planned and systematic activities implemented within the quality system, and demonstrated as needed, to provide adequate confidence that an entity will fulfil requirements for quality (ISO 8402*).

Quality control — The operational techniques and activities that are used to fulfill requirements for quality (ISO 8402*).

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

RADAR WEATHER ECHO INTENSITY LEVELS — Existing radar systems cannot detect turbulence. However, there is a direct correlation between the degree of turbulence and other weather features associated with thunderstorms and the radar weather echo intensity. The National Weather Service has categorized radar weather echo intensity for precipitation into six levels. These levels are sometimes expressed during communications as "VIP LEVEL" 1 through 6 (derived from the component of the radar

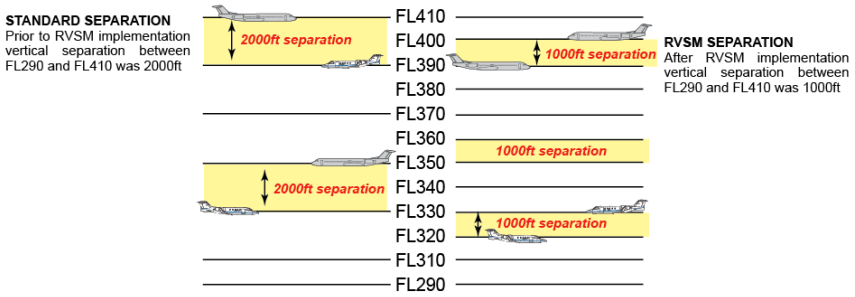
that produces the information — Video Integrator and Processor). The following list gives the "VIP LEVELS" in relation to the precipitation intensity within a thunderstorm :

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

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

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

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



RELIEF — The inequalities in elevation of the surface of the Earth represented on aeronautical charts by contours, hypsometric tints, shading or spot elevations.

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.).

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

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

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

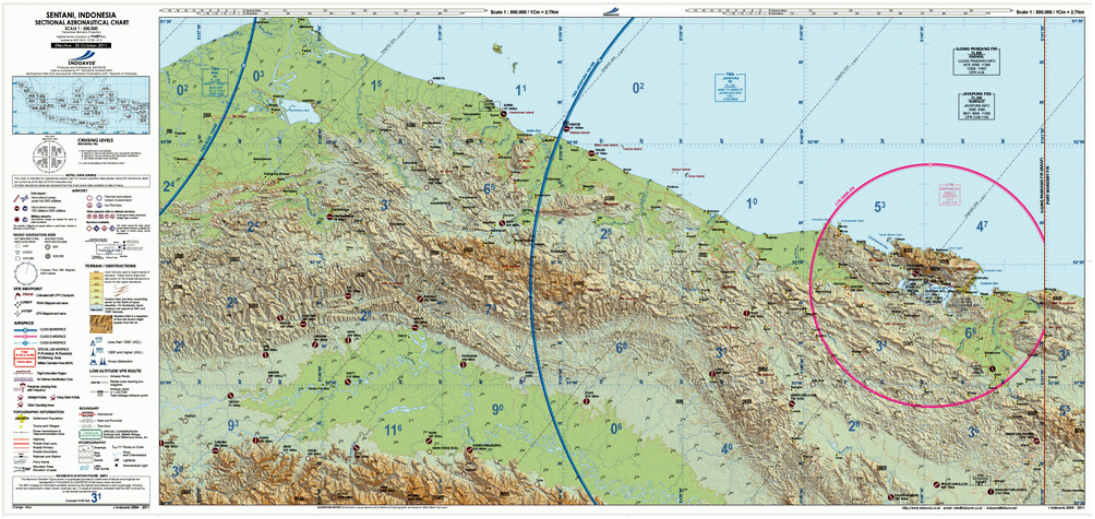
a. in the case of a displaced threshold, the lights between the beginning of the runway and the displaced threshold shall show red in the approach direction; and
b. a section of the lights 600m or one-third of the runway length, whichever is the less, at the remote end of the runway from the end at which the takeoff run is started, may show yellow.

RUNWAY MARKINGS —

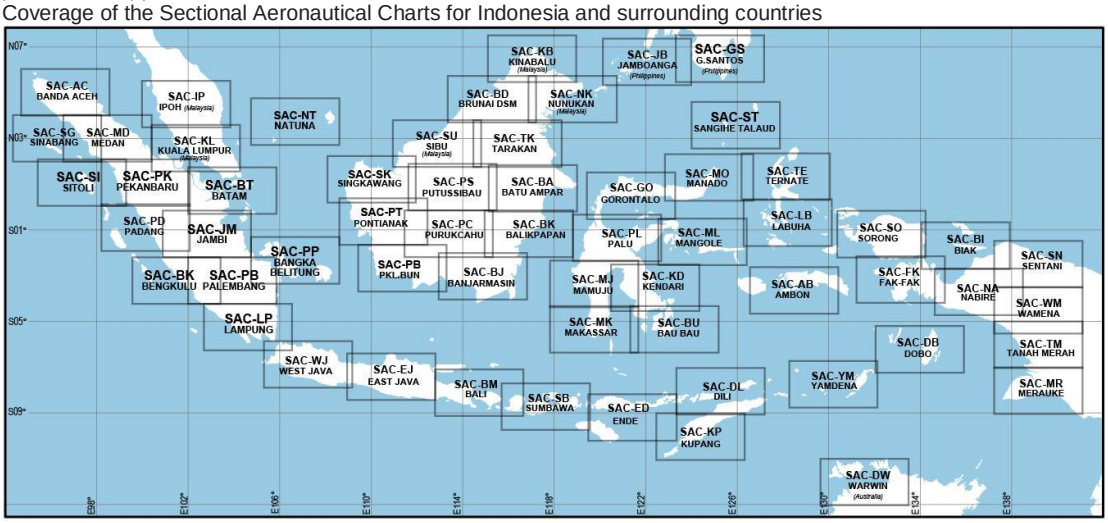
a. Basic marking — Markings on runways used for operations under visual flight rules consisting of centerline markings and runway direction numbers and, if required, letters.
b. Instrument marking — Markings on runways served by non visual navigation aids and intended for landings under instrument weather conditions, consisting of basic marking plus threshold markings.
c. All-weather (precision instrument) marking.

RUNWAY END SAFETY AREA (RESA) — are designated areas at each end of the runway intended to minimize the risk of damage to an aeroplane where an aeroplane overruns or undershoots a runway. The RESA is beyond and in addition to the runway strip.

SECTIONAL AERONAUTICAL CHART (SAC) 1:500.000 — is the standard aviation medium-scale aeronautical chart series. The SAC and other aeronautical navigation and planning charts provide essential cartographic data appropriate to scale, and are overprinted with stable aeronautical information such as obstructions, aerodromes, special use airspace, navigational aids, Maximum Elevation Figures (MEFs), and related data.



- **DATA DENSITY/SCALE:** 1:500,000
- **CONTENT:** Cartographic data with aeronautical overprint depicting obstructions, aerodromes, special use airspace, navigational aids and related data. Because of scale, some features, including obstructions, are generalized in developed regions (only the highest obstruction within ticked area or urban quadrant is shown).
- **MEDIA:** Paper chart (100 Cm x 50 Cm)
- **AREA COVERAGE:** All navigationally significant land masses Indonesia. Generally, are associated with each Operational Navigation Chart (ONC). SACs may substitute for larger scale products when the larger standard scale provides no appreciable increase in detail.
  Coverage of the Sectional Aeronautical Charts for Indonesia and surrounding countries



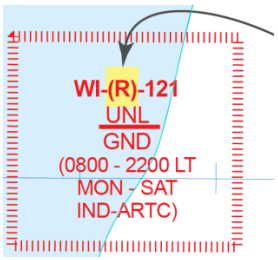
- **APPLICATIONS:** Designed for very low-altitude (below 500 feet above ground level) through medium-altitude high-speed visual and radar navigation. Also used for mission planning/analysis and intelligence briefings, and are source for navigational filmstrips, special purpose, and cockpit/visual display products.

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.

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

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

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



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

STANDARD INSTRUMENT ARRIVAL (STAR) — 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) — 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 en-route phase of a flight commences.

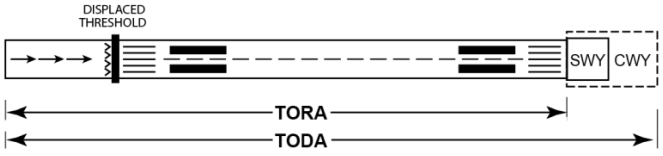
STATION DECLINATION — The orientation with respect to true north of VHF transmitted signals. The orientation is originally made to agree with the
magnetic variation (an uncontrollable global phenomenon) at the site. Hence station declination (fixed by man) may differ from changed magnetic variation until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

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.

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

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

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



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

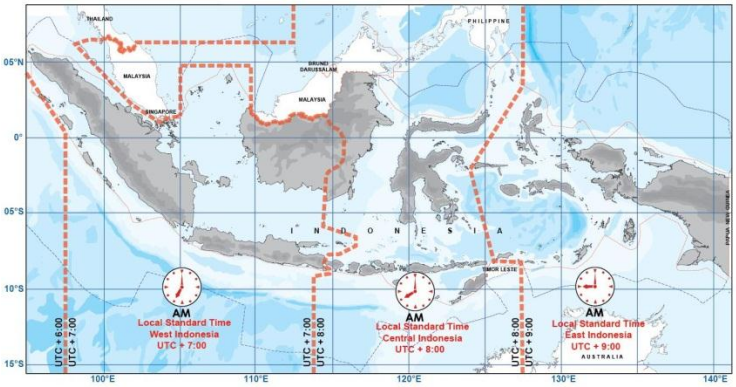
TERMINAL ARRIVAL ALTITUDE (TAA) — The lowest altitude that will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an arc of a circle defined by a 46-km (25 NM) radius centred on the initial approach fix (IAF), or where there is no IAF on the intermediate approach fix (IF), delimited by straight lines joining the extremity of the arc to the IF. The combined TAAs associated with an approach procedure shall account for an area of 360 degrees around the IF.

THRESHOLD — The beginning of that portion of the runway usable for landing and take-off.

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

TIME ZONE - A day is defined as the time required for the Earth to make one complete rotation of 360°. Since the day is divided into 24 hours, the Earth revolves at the rate of 15° an hour.

Indonesia West = UTC + 7hr
Indonesia Center = UTC + 8hr
Indonesia East = UTC + 9hr



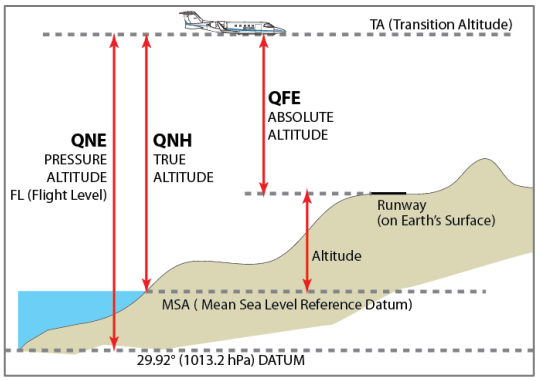
Indonesia Time zone

TOUCHDOWN ZONE ELEVATION (TDZE) — The highest elevation in the first 300' of the landing surface.

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

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

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

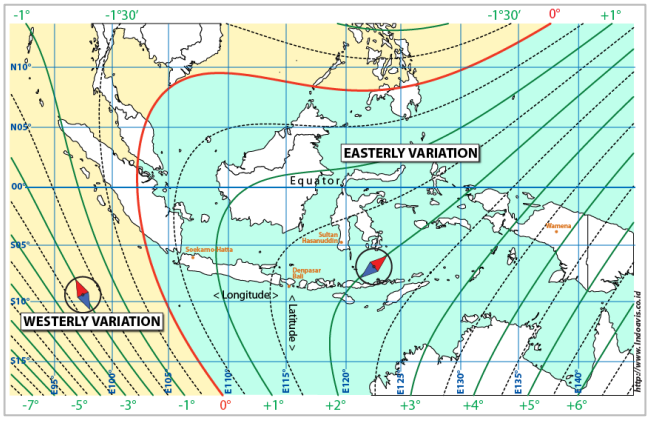


TRANSITION LAYER — The airspace between the transition altitude and the transition level. Aircraft descending through the transition layer will use altimeters set to local station pressure, while departing aircraft climbing through the layer will be using standard altimeter setting (QNE) of 29.92 inches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

VARIATION — Variation is the angle between True North and the direction indicated by a freely suspended compass needle, influenced only by the Earth's magnetic field. Variation is termed East or West according to whether magnetic North lies to the East or West of true North.

Sample of Indonesia Airport in Magnetic Variation :

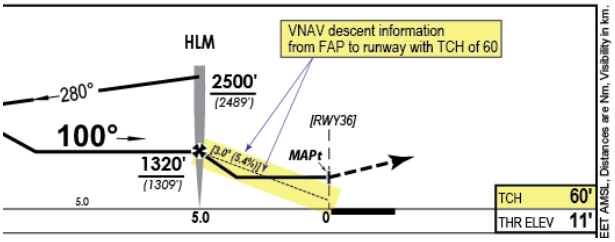
- WIII - Soekarno Hatta (Jakarta) is 0.38°
- WARJ - Adi Sutjipto (Yogyakarta) is 1.21°
- WAAA - S.Hasanuddin (Makassar) is 1.43°
- WAJW – Wamena (Papua) is 4°.



On the west coast of the Indonesia, the compass needle points to the east of true north; on the east coast, the compass needle points to the west of true north.

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

The descent angle shown on some non-precision approaches describing the geometric descent path from the Final approach point (FAP), or on occasion from an intervening step down fix, to the Threshold Crossing Height (TCH). This angle may or may not coincide with the angle projected by a Visual Glide Slope Indicator (VASI, PAPI, PLASI, etc.)



VISIBILITY — 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.

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

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

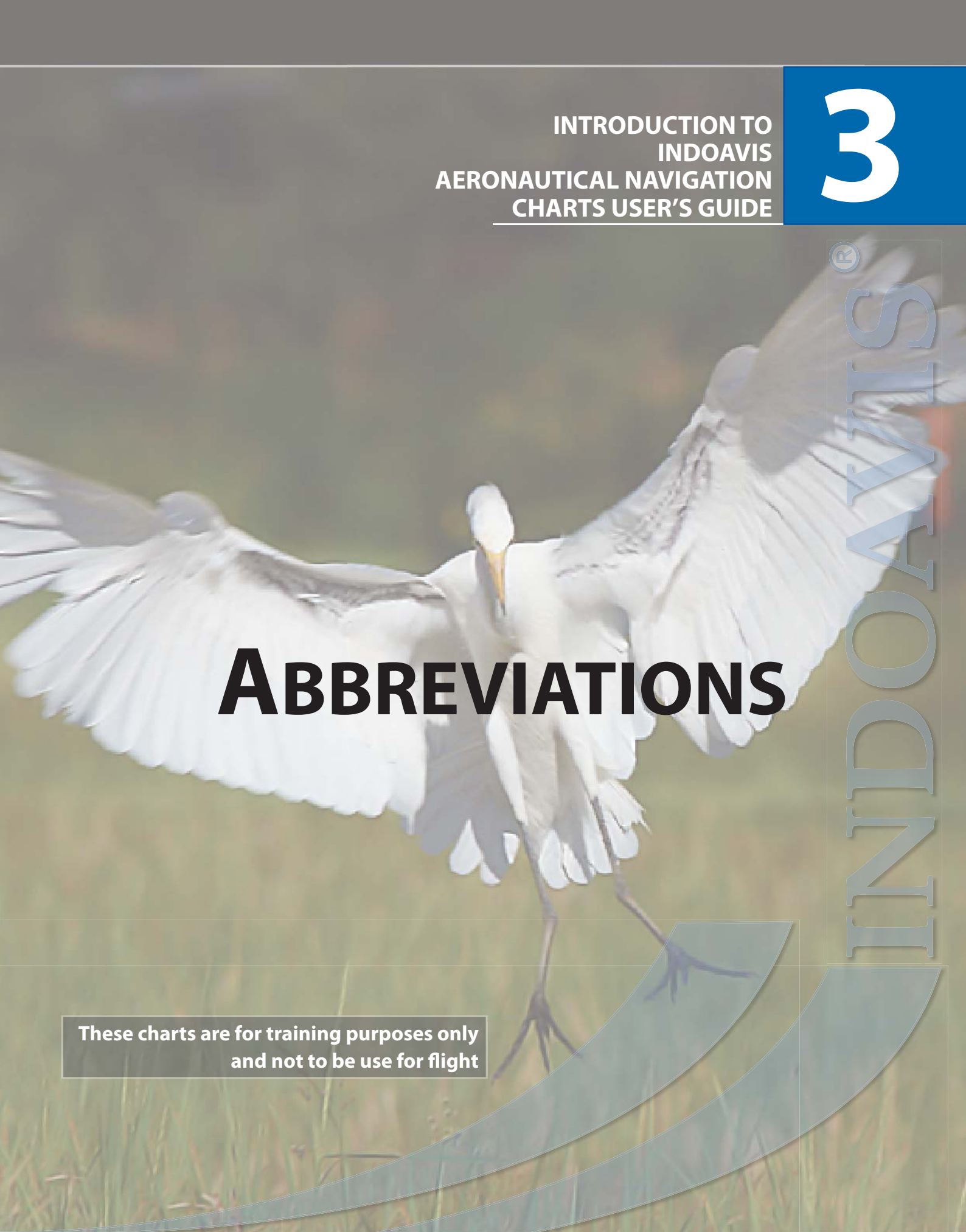
VISUAL DESCENT POINT (VDP) — A defined point on the final approach course of a non-precision straight-in approach procedure from which normal descent from the MDA to the runway touchdown point may be commenced, provided the approach threshold of that runway, or approach lights, or other markings identifiable with the approach end of that runway are clearly visible to the pilot.

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

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

INTRODUCTION TO
INDOAVIS
AERONAUTICAL NAVIGATION
CHARTS USER'S GUIDE

3



ABBREVIATIONS

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

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INDOAVIS®

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DOC NO: INDOAVIS.UG.0I/III/2009

INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

English Version

ABBREVIATION

A - *ALPHA*

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

B - *BRAVO*

BASARNAS	Badan SAR Nasional (SAR)
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 - *CHARLIE*

C	ATC IFR Flight Plan Clearance - Delivery Frequency
CAE	Control Area Extension
CA/GRS	Certified Air/Ground Radio Service
CANPA	Constant Angle Non-Precision Approach
CARS	Community Aerodrome Radio Station
CAT	Category
CBA	Cross Border Area
CDFA	Continuous Descent Final Approach
CDI	Course Deviation Indicator
CDR	Conditional Route
CDT	Central Daylight Time
CEIL	Ceiling
CERAP	Combined Center/Radar Approach Control
CFIT	Controlled Flight Into Terrain
CGAS	Coast Guard Air Station
CGL	Circling Guidance Lights
CH	Channel
CH	Critical Height
CHGD	Changed
CL	Centerline Lights
CNF	Computer Navigation Fix
CO	County
COMLO	Compass Locator
COMMS	Communications
CONT	Continuous
CONTD	Continued
COORDS	Coordinates
COP	Change Over Point
CORR	Corridor
CP	Command Post
CPDLC	Controller Pilot Data Link Communications
Cpt	Clearance (Pre-Taxi Procedure)
CRP	Compulsory Reporting Point
CRS	Course
CST	Central Standard Time
CTA	Control Area
CTAF	Common Traffic Advisory Frequency
CTL	Control
CTOT	Calculated Take-off Time
CTR	Control Zone
CVFP	Charted Visual Flight Procedure
CVFR	Controlled VFR

D - *DELTA*

D	Day
DA	Decision Altitude
DA (H)	Decision Altitude (Height)
D-ATIS	Digital ATIS
DCL	Data Link Departure Clearance Service
DCT	Direct
DECMSND	Decommissioned
DEG	Degree
DEP	Departure Control
DEPARTURE	Departure Procedure
DER	Departure End of Runway
DEWIZ	Distance Early Warning Identification Zone
DF	Direction Finder
DISPL THRESH	Displaced Threshold
DIST	Distance
DGCA	Directorate General Of Civil Aviation
DME	Distance-Measuring Equipment
DOD	Department of Defense
DOM	Domestic

E - *ECHO*

E	East or Eastern
EAT	Expected Approach Time
EDT	Eastern Daylight Time
EET	Estimated Elapsed Time
EFAS	Enroute Flight Advisory Service
EFF	Effective
EFVS	Enhanced Flight Vision System
ELEV	Elevation
EMAS	Engineered Materials Arresting System
EMERG	Emergency
ENG	Engine
EOBT	Estimated Off Block Time
EST	Eastern Standard Time
EST	Estimated
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
ETE	Estimated Time Enroute
ETOPS	Extended Range Operation with airplanes
EVS	Enhanced Vision System

E - *FOXTROT*

FAA	Federal Aviation Administration
FACF	Final Approach Course Fix
FAF	Final Approach Fix
FAIL	Failure
FANS	Future Air Navigation System
FAP	Final Approach Point
FAR	Federal Aviation Regulation
FAT	Final Approach Track
FATO	Final Approach and Take-off Area
FCP	Final Control Point
FIC	Flight Information Center
FIR	Flight Information Region
FIS	Flight Information Service
FL	Flight Level (Altitude)
FLD	Field
FLG	Flashing
FLT	Flight
FM	Fan Marker
FMC	Flight Management Computer
FMS	Flight Management System
FPM	Feet Per Minute
FPR	Flight Planning Requirements
FREQ	Frequency
FSS	Flight Service Station
FT	Feet
FTS	Flexible Track System

G - GOLF

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 [GNSS]	Global Navigation Satellite System Landing System
GMT	Greenwich Mean Time
GND	Ground Control
GND	Surface of the Earth (either land or water)
GNSS	Global Navigation Satellite System
GP	Glidepath
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
GS	Glide Slope
G/S	Ground Speed
GWT	Gross Weight

H - HOTEL

H	Non-Directional Radio Beacon or High Altitude
H-24	24.Hour Service
HAA	Height Above Airport
HALS	High Approach Landing System
HAS	Height Above Site
HAT	Height Above Touchdown
HC	Critical Height
HDG	Heading
HF	High Frequency (3-30 MHz)
HGS	Head-up Guidance System
HI	High (altitude)
HI	High Intensity (lights)
HIALS	High Intensity Approach Light System
HIRL	High Intensity Runway Edge Lights
HIWAS	Hazardous Inflight Weather Advisory Service
HJ	Hour Sunrise to Sunset
HN	Hour Sunset to Sunrise
HO	By Operational Requirements
hPa	Hectopascal (one hectopascal = one millibar)
HR	Hours (period of time)
HS	Hours of Scheduled Operations
HST	High Speed Taxiway Turn-off
HUD	Head-up Display
HUDLS	Head-Up Display Landing System
HX	No Specific Working Hours
Hz	Hertz (cycles per second)

I - INDIA

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
ID	Indonesia
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

J - JULIET

JAA	Joint Aviation Authority

K - KILO

KGS	Kilograms
kHz	Kilohertz
KIAS	Knots Indicated Airspeed
KM	Kilometers
KMH	Kilometer(s) per Hour
KT	Knots
KTAS	Knots True Airspeed

L - LIMA

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
LUBS	Pounds (Weight)
LCG	Load Classification Group
LCN	Load Classification Number Lctr Locator (Compass)
LDA	Landing Distance Available
LDA	Localizer-type Directional Aid
LDI	Landing Direction Indicator

LDIN	Lead-in Light System
LGTH	Length
LIM	Locator Inner Marker
LIRL	Low Intensity Runway Lights
LLWAS	Low Level Wind Shear Alert System
LMM	Locator Middle Marker
LNAV	Lateral Navigation
LNDG	Landing
LO	Locator at Outer Marker Site
LOC	Localizer
LOM	Locator Outer Marker
LONG	Longitude
LPV	Localizer Performance with Vertical Guidance
LSALT	Lowest Safe Altitude
LT	Local Time
LTS	Lights
LVP	Low Visibility Procedures
LWIS	Limited Weather Information System

M *- MIKE*

M	Meters
MAA	Maximum Authorized Altitude
MAG	Magnetic
MAHF	Missed Approach Holding Fix
MALS	Medium Intensity Approach Light System
MALSF	Medium Intensity Approach Light System with Sequenced Flashing Lights
MALSR	Medium Intensity Approach Light System with Runway Alignment Indicator Lights
MAP (MAP't)	Missed Approach Point
MAX	Maximum
MB	Millibars
MCA	Minimum Crossing Altitude
MCAF	Marine Corps Air Facility
MCAS	Marine Corps Air Station
MCTA	Military Controlled Airspace
MDA	Minimum Descent Altitude
MDA(H)	Minimum Descent Altitude (Height)
MDT	Mountain Daylight Time
MEA	Minimum En-route Altitude
MEF	Maximum Elevation Figure
MEHT	Minimum Eye Height Over Threshold
MEML	Memorial
MET	Meteorological
MF	Mandatory Frequency
MFA	Minimum Flight Altitude
MHA	Minimum Holding Altitude
MHz	Megahertz
MI	Medium Intensity (lights)
MIALS	Medium Intensity Approach Light System
MIL	Military
MIM	Minimum
MIN	Minute
MIRL	Medium Intensity Runway Edge Lights
MKR	Marker Radio Beacon
MLS	Microwave Landing System
MM	Middle Marker
MNM	Minimum
MNPS	Minimum Navigation Performance Specifications
MOA	Military Operation Area
MOCA	Minimum Obstruction Clearance Altitude
MORA	Minimum Off-Route Altitude (Grid or Route)
MRA	Minimum Reception Altitude
MSA	Minimum Safe/Sector Altitude
MSL	Mean Sea Level
MST	Mountain Standard Time
MTA	Military Training Area
MTAF	Mandatory Traffic Advisory Frequency
MTCA	Minimum Terrain Clearance Altitude
MTMA	Military Terminal Control Area
MTOW	Maximum Take-off Weight
MUN	Municipal
MVA	Minimum Vectoring Altitude

N *- NOVEMBER*

N	Night, North or Northern
NA	Not Authorized
NAAS	Naval Auxiliary Air Station
NADC	Naval Air Development Center
NAEC	Naval Air Engineering Center
NAF	Naval Air Facility
NALF	Naval Auxiliary Landing Field
NAP	Noise Abatement Procedure
NAR	North American Routes
NAS	Naval Air Station
NAT	North Atlantic Traffic
NAT/OTS	North Atlantic Traffic/Organized Track System
NATL	National
NAVAID	Navigational Aid
NCA	Northern Control Area
NCRP	Non-Compulsory Reporting Point
NDB	Non-Directional Beacon/Radio Beacon
NE	Northeast
NM	Nautical Mile(s)
No	Number
NoPT	No Procedure Turn
NOTAM	Notices to Airmen
NPA	Non-Precision Approach
NW	Northwest
NWC	Naval Weapons Center

O *- OSCAR*

O/A	On or About
OAC	Oceanic Area Control
OAS	Obstacle Assessment Surface
OCA	Oceanic Control Area
OCA (H)	Obstacle Clearance Altitude (Height)
OCL	Obstacle Clearance Limit
OCNL	Occasional

OCTA	Oceanic Control Area
ODALS	Omni-Directional Approach Light System
OM	Outer Marker
OPS	Operations or Operates
OLS	Obstacle Limitation Survace
O/R	On Request
O/T	Other Times
OTR	Oceanic Transition Route
OTS	Out-of-Service

P - *PAPA*

PA	Precision Approach
PAL	Pilot Activated Lighting
PANS-OPS	Procedures for Air Navigation Services - Aircraft Operations
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
PCL	Pilot Controlled Lighting
PCN	Pavement Classification Number
PCZ	Positive Control Zone
PDC	Pre-Departure Clearance
PDG	Procedure Design Gradient
PDT	Pacific Daylight Time
PERM	Permanent
PinS	Point In Space
PISTON	Piston Aircraft
PJE	Parachute Jumping Exercise
PLASI	Pulsating Visual Approach Slope Indicator
POLUD	Polisi Udara (Air Police)
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

Q - *QUEBEC*

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 - *ROMEO*

R	R-063 or 063R Magnetic Course (radial) measured as 063 from a VOR station. Flight can be inbound or outbound on this line.
RA	Radio Altimeter
RAI	Runway Alignment Indicator
RAIL	Runway Alignment Indicator Lights
RAIM	Receiver Autonomous Integrity Monitoring
RAPCON	Radar Approach Control
RASS	Remote Altimeter Source
RCAG	Remote Communications Air Ground
RCC	Rescue Coordination Center
RCL	Runway Centerline
RCLM	Runway Center Line Markings
RCO	Remote Communications Outlet
REF	Reference
REIL	Runway End Identifier Lights
REP	Reporting Point
RESA	Runway End Safety Area
REV	Reverse
REP	Ramp Entrance Point
RF	Radius to Fix
RL	Runway (edge) Lights
RNAV	Radio Area Navigation
RNP	Required Navigation Performance
RNPC	Required Navigation Performance Capability
ROC	Rate of Climb
RON	Remain Overnight
RPT	Regular Public Transport
RSA	Runway Safety Area
RTE	Route
RTF	Radiotelephony
RTS	Return to Service
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
RVV	Runway Visibility Values
RWY	Runway

S - *SIERRA*

S	South or Southern
SAAAR	Special Aircrew and Aircraft Authorization Required
SALS	Short Approach Light System
SALSF	Short Approach Light System with Sequenced Flashing Lights
SAP	Stabilized Approach
SAR	Search and Rescue
SATCOM	Satellite voice air-ground calling
SAWRS	Supplementary Aviation Weather Reporting Station
SBAS	Satellite-Based Augmentation System
SCA	Southern Control Area
SCOB	Scattered Clouds or Better
SDF	Simplified Directional Facility
SE	Southeast
SEC	Seconds
SELCAL	Selective Call System
SFC	Surface of the earth (either land water)
SFL	Sequenced Flashing Lights
SFL-V	Sequenced Flashing Lights - Variable Light Intensity
SID	Standard Instrument Departure

SIWL	Single Isolated Wheel Load
SKD	Scheduled
SLP	Speed Limiting Point
SM	Statute Miles
SMA	Segment Minimum Altitude
SMGCS	Surface Movement Guidance and Control System
SMSA	Segment Minimum Safe Altitude
SOC	Start of Climb
SODALS	Simplified Omnidirectional Approach Lighting System
SPAR	French Light Precision Approach Radar
SRA	Special Rules Area
SRA	Surveillance Radar Approach
SRE	Surveillance Radar Element
SR-SS	Sunrise-Sunset
SSALF	Simplified Short Approach Light System with Sequenced Flashing Lights
SSALR	Simplified Short Approach Light System with Runway Alignment Indicator Lights
SSALS	Simplified Short Approach Light System
SSB	Single Sideband
SSR	Secondary Surveillance Radar (in U.S.A. ATCRBS)
STAR	Standard Instrument Arrival
STD	Indication of an altimeter set to 29.92" Hg or 1013.2 Mb without temperature correction
Std	Standard
ST-IN	Straight-in
STOL	Short Take-off and Landing
SUPP	Supplement
SW	Single Wheel Landing Gear
SW	Southwest
SYS	System

T - *TANGO*

T	Terrain clearance altitude (MOCA)
T	Transmits only (radio frequencies)
T-VASI	Tee Visual Approach Slope Indicator
TA	Transition Altitude
TAA	Terminal Area Altitude
TACAN	Tactical Air Navigation (bearing and distance station)
TAS	True Air Speed
TCA	Terminal Control Area
TCAS	Traffic Alert and Collision Avoidance System
TCH	Threshold Crossing Height
TCTA	Transcontinental Control Area
TDWR	Terminal Doppler Weather Radar
TDZ	Touchdown Zone
TDZE	Touchdown Zone Elevation
TEMP	Temporary
TERPS	United States Standard for Terminal Instrument Procedure
THR	Threshold
TIBA	Traffic Information Broadcast by Aircraft
TL	Transition Level
TMA	Terminal Control Area
TML	Terminal
TMN	Terminates
TMZ	Transponder Mandatory Zone
TNA	Transition Area
TNI	Tentara Nasional Indonesia (Indonesian Army)
TODA	Take-off Distance Available
TORA	Take-off Run Available
TP	Turning Point
TRACON	Terminal Radar Approach Control
TRANS	Transition(s)
TRANS ALT	Transition Altitude
TRANS LEVEL	Transition Level
TRCV	Tri-Color Visual Approach Slope Indicator
TSA	Temporary Segregated Area
TVOR	Terminal VOR
TWEB	Transcribed Weather Broadcast
TWIP	Terminal Weather Information for Pilots
TWR	Tower (Aerodrome Control)
TWY	Taxiway

U - *UNIFORMO*

U	Unspecified
U	UNICOM
UFN	Until Further Notice
UHF	Ultra High Frequency (300-3000MHz)
UIR	Upper Flight Information Region
UNCT'L	Uncontrolled
UNICOM	Aeronautical Advisory Service (A) Automated UNICOM
UNL	Unlimited
U/S	Unserviceable
USB	Upper Sideband
UTA	Upper Control Area
UTC	Coordinated Universal Time

V - *VICTOR*

VAR	Variation Magnetic
VASI	Visual Approach Slope Indicator
VDP	Visual Descent Point
VE	Visual Exempted
VFR	Visual Flight Rules
VGSI	Visual Glide Slope Indicator
VHA	Volcanic Hazard Area
VHF	Very High Frequency
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	VOR Radiated Test Signal
VPA	Vertical Path Angle
VV	Vertical Visibility
V/V	Vertical Velocity or speed
WAAS	Wide Area Augmentation System

W - *WHISKEY*

W	West or Western
W/O	Without
WP	Waypoint
WSP	Weather Systems Processor
WX	Weather

X – *X-RAY*

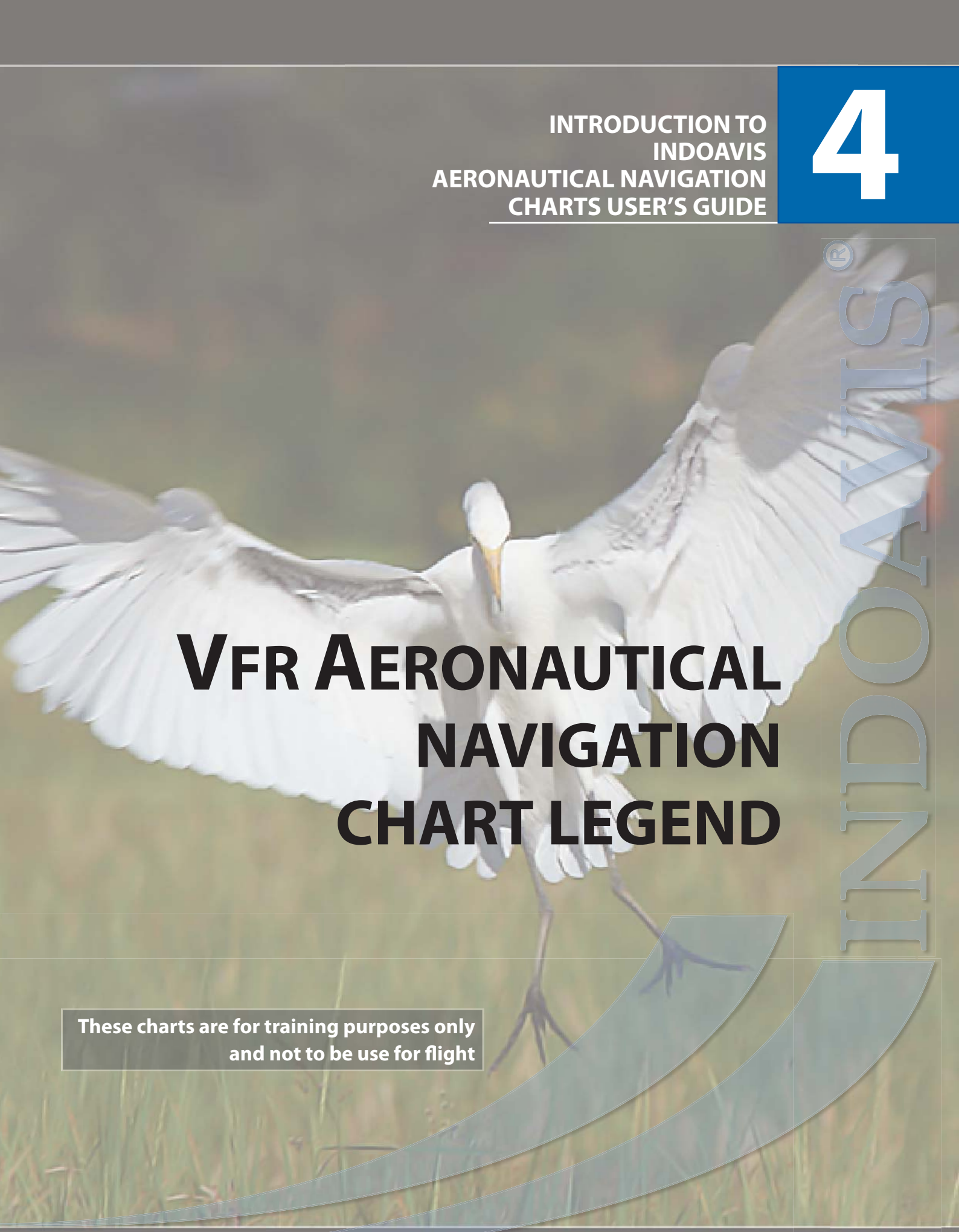
X	On Request

Z - *ZULU*

Z	Zulu Time
Z	Coordinated Universal Time (UTC) Zulu Time

INTRODUCTION TO
INDOAVIS
AERONAUTICAL NAVIGATION
CHARTS USER'S GUIDE

4



VFR AERONAUTICAL NAVIGATION CHART LEGEND

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

INDOAVIS®

INDOAVIS®

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DOC NO: INDOAVIS.UG.0I/III/2009

INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

English Version

VFR AERONAUTICAL NAVIGATION CHART LEGEND

VFR CHART LEGEND

GENERAL

An AERONAUTICAL CHARTS is a map designed to assist in navigation of aircraft, much as nautical charts do for water-craft, or a roadmap for drivers. Using these charts and other tools, pilots are able to determine their position, safe altitude, best route to a destination, navigation aids along the way, alternative landing areas in case of an in-flight emergency, and other useful information such as radio frequencies and airspace boundaries. There are charts for all land masses on Earth, and long-distance charts for trans-oceanic travel.

Specific charts are used for each phase of a flight and may vary from a map of a particular airport facility to an overview of the instrument routes covering an entire continent (e.g., global navigation charts), and many types in between.
Visual flight charts are categorized according to their scale, which is proportional to the size of the area covered by one map. The amount of detail is necessarily reduced when larger areas are represented on a map.

INDOAVIS AERONAUTICAL NAVIGATION CHART SERIES

TERMINAL NAV-CHART

- CIVIL AIRNAV MANUAL (ANM)
- MILITARY AIRNAV MANUAL (FLIP)
- HELICOPTER AIRNAV MANUAL (HAM)
- AIRPORT FACILITY/DIRECTORY (AFD)

IFR (INSTRUMENT) NAV-CHART

- EN-ROUTE (High & Low Altitude)
- SAFETY ROUTE CHART (low Altitude)

VFR (VISUAL) NAV-CHART

- WAC(World Aeronautical Chart) 1:1.000.000
- ONC (Operational Navigation Chart) 1:1.000.000
- SAC (Sectional Aeronautical Chart) 1:500.000
- TMA (Terminal Area Chart) 1:250.000
- HRC (Helicopter Routing Chart) 1:50.000

CORRECTIONS, COMMENTS

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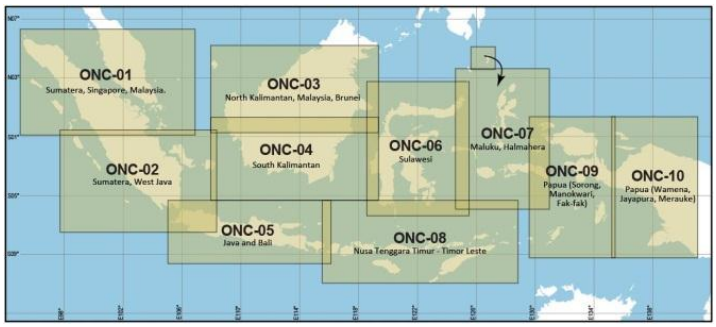
See the FAQs prior to contact number or email.

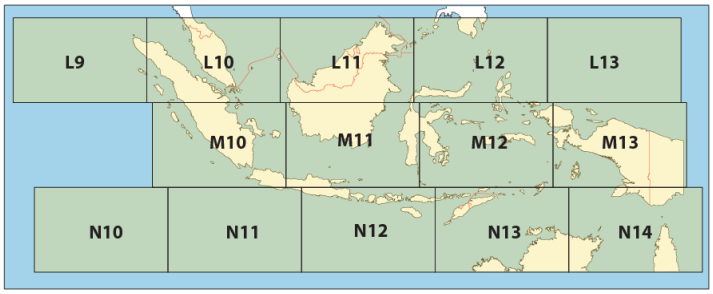
TECHNICAL SPECIFICATIONS

Chart Code	**O N C**
Chart Name	**OPERATIONAL NAVIGATION CHART**
General Description	The Operational Navigation Chart, is designed to satisfy en-route visual and radar requirements of pilots/navigators flying at medium altitudes (2.000-25.000 feet above ground level) and low altitude (500-2.000 feet above ground level) or low altitude-high speed operations.
Scale of Chart	1 : 1.000.000/1Cm = 5.4 nm / 10 km / 6.21 miles
Projection	Mercator
Coordinate:	Reference System Geographical (latitude/longitude)
Contour Interval	1.000 feet including the first supplementary 500 foot contour in areas of moderate level or gently rolling areas.
Accuracy	**Horizontal** - No less than 90% of welldefineddetail within ± 500 meter of their true position at map scale. **Vertical** - No less than 90% of elevations within ± 500 feet of their true elevation. This accuracy may not be achieved in areas of dense vegetation.
Coverage Area	Indonesia, Malaysia, Singapore, Brunei Darussalam and Timor Leste
Comparison	Described below comparison sheet index VFR Chart scale 1:1,000,000 prevailing in the world of aviation. between ICAO-WAC, DOD-USA and INDOAVIS, each has a reason and function usage.

INDOAVIS ONC Sheet Index



DOD-USA ONC Sheet Index



WAC-ICAO Sheet Index

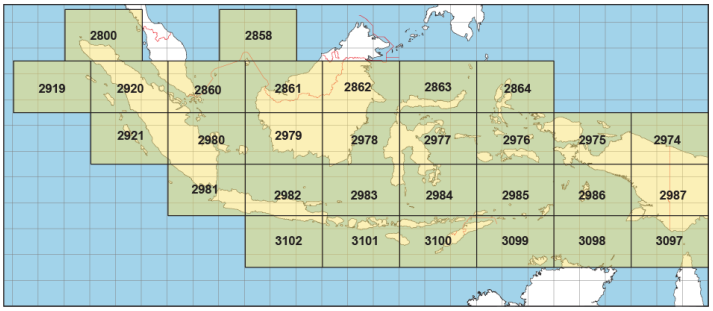


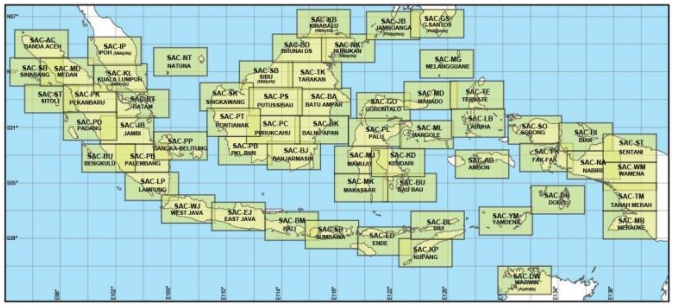
Chart Code	**S A C**
Chart Name	**SECTIONAL AERONAUTICAL CHART**
General Description	The Sectional Chart or Tactical Pilotage Chart, is designed to provide an intermediate scale translation of cultural and terrain features for pilots/navigators flying at very low altitudes (below 500 feet above ground level) through medium altitudes or low altitude-high speed operations. Complete coverage of the Indonesia area of influence is available.
Scale of Chart	1 : 500.000 / 1Cm = 2.7 nm / 5 km / 3.11 miles
Projection	Mercator
Coordinate:	Reference System Geographical (latitude/longitude)
Contour Interval	500 feet including the first supplementary 250 foot contour in areas of moderate level or gently rolling areas.
Accuracy	**Horizontal** - No less than 90% of well defined detail within ± 300 meter of their true position at map scale. **Vertical** - No less than 90% of elevations within ± 300 feet of their true elevation. This accuracy may not be achieved in areas of dense vegetation.
Coverage Area	Indonesia, Malaysia, Singapore, Brunei Darussalam, Timor Leste and Australia
Sheet Index	

Chart Code	**TAC / A N C**
Chart Name	**TERMINAL AREA CHART**
General Description	TAC's depict the airspace designated as Class B airspace. While similar to sectional charts, TAC's have more detail because the scale is larger. The TAC should be used by pilots intending to operate to or from airfields within or near Class B or Class C airspace. Areas with TAC coverage are indicated by a • on the Sectional Aeronautical Chart indexes
Scale of Chart	1 : 250.000000 / 1Cm = 1.35 nm / 2.5 km /1.55 miles
Projection	Mercator
Coordinate:	Reference System Geographical (latitude/longitude)
Contour Interval	250 feet including the first supplementary 125 foot contour in areas of moderate level or gently rolling areas.
Accuracy	**Horizontal** - No less than 90% of well defined detail within ± 150 meter of their true position at map scale. **Vertical** - No less than 90% of elevations within ± 150 feet of their true elevation. This accuracy may not be achieved in areas of dense vegetation.

Aeronautical Charts

CHART TYPES

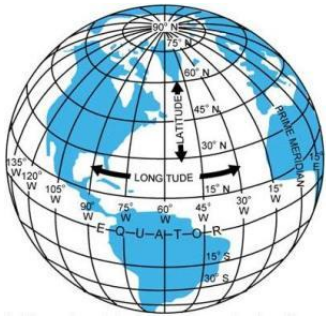
Three types of charts are used for VFR flight. These are:

1. World Aeronautical Chart-ICAO (WAC)
2. Operational Navigation Chart (ONC)
3. Sectional Aeronautical Chart (SAC)
4. Terminal Area Charts (TMA

Most pilots use the Sectional chart. It provides good detail of topographical features, and is good for both the Student pilot as well as experienced pilot.
Since the WAC/ONC chart covers twice the area of the Sectional, pilots flying higher performance aircraft may prefer this chart. It shows less topographical features.
It contains most of the electronic navigation features that are shown on the sectional charts. Both the WAC/ONC and SAC show the Victor Airways.

VFR Terminal Charts are published for areas of concentrated air traffic, such as Jakarta, Java, etc. These charts show many more details. They contain landmarks often used by controllers not shown on the other chart types.
Charts show significant terrain and topographical detail, location of cities and towns, airports, navigational aids, prohibited, restricted and special use airspace, and many other symbols.

Longitude and Latitude



It runs north and south through Greenwich, England. Measurement is either EAST or WEST from the Prime Meridian, and continues around the earth until they meet at meridian 180.The measurement, either East or West is measured in degrees, minutes and seconds. This measurement is called “Longitude”. The example dot on the diagram is at Longitude 30° 45’ W (30 degrees, 45 minutes West).

Meridians are not parallel. They converge at the poles, and have maximum distance between them at the equator. They represent the direction to True North. At the equator, one minute of arc longitude equals one nautical mile. The only place where 1° longitude = 1 Nm is on the equator. As one moves toward either pole, the lateral distance across one degree becomes less and less, and approaches zero at the pole. Since the earth makes one revolution of 360 degrees within 24 hours, it moves 15° in one hour.

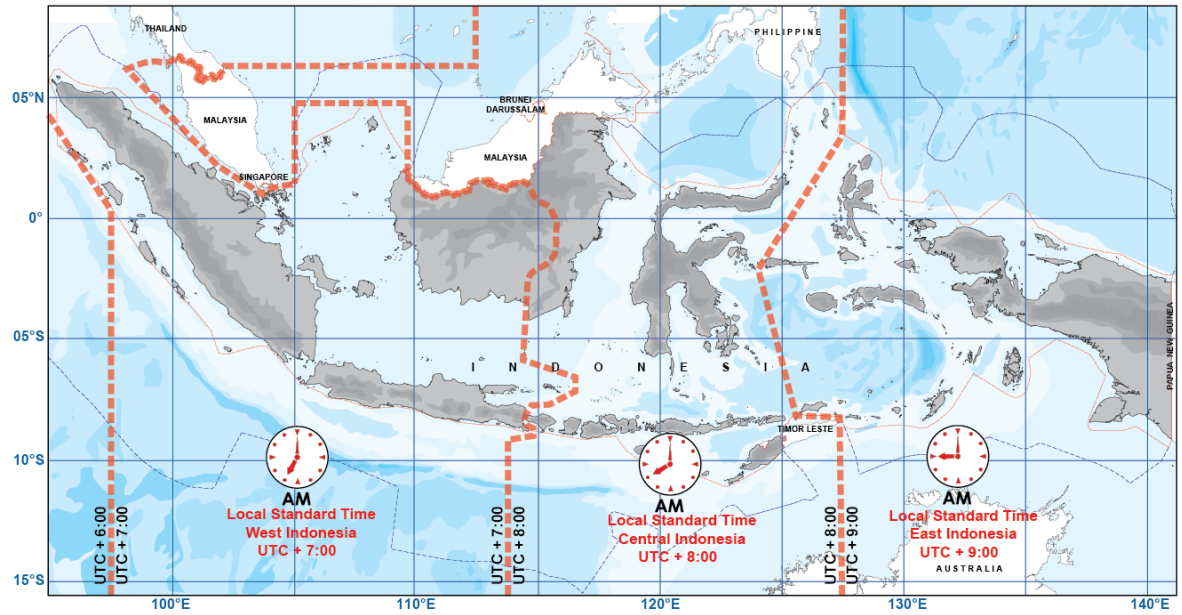
The lines running around the earth, parallel to the equator, are called lines of parallel (or parallels). They are measured from the equator to the poles in terms called degrees of latitude. They range from 0° latitude at the equator to 90° latitude at the poles. They are termed North latitude in the Northern Hemisphere, and South latitude in the Southern Hemisphere. Unlike Meridian Lines, lines of parallel are equidistant between them (since they are parallel and do not converge). ***One minute of latitude equals a nautical mile.***

The Latitude of the dot shown on the earth’s surface in the diagram above is defined as 35° 20’ N. Therefore, the location of the dot can be explicitly defined as ***35° 20’N - 30° 45’ W.***

Aeronautical charts show horizontal latitude lines and vertical longitude lines at 30 minute intervals. They are labeled near the edges of the chart, and periodically along the line. There are 30 “tick” marks between each 30 minute line, each representing one minute. The 10 minute marks are long, and the 5 minute marks are intermediate in length. One can determine latitude by locating the line below the point in question, then count upward, adding the number of tick marks from the reference line. When parallel with the point, the latitude location has been reached. (NOTE: If the latitude line is above the point in question, count the tick marks downward. Subtract them from the latitude line value. When moving North, add degrees and minutes. When moving South, subtract degrees and minutes).

To find the longitude of a point is similar. Count the tick marks either East or West from the reference longitude line to the point in question. When going in a westerly direction, add degrees and minutes. Subtract degrees and minutes when going in an easterly

Time Zones



Since Greenwich, England is at the zero meridian, all time references used in flying is to the time at the zero meridian. This used to be Greenwich Mean Time. The terminology is now Coordinated Universal Time (abbreviated UTC). In aviation terminology, the word ***ZULU*** refers to UTC time, and is written with a Z suffix.

Examples: 1450Z, 0024Z, 0400Z, etc.

A conversion from local time in the INDONESIA to UTC time is required for flight plansand communications

NOTE: If the local time is Daylight Savings Time, reduce the added hours by 1 Hour (4, 5, 6, 7 respectively).

Examples: 1450Z, 0024Z, 0400Z, etc.

A conversion from local time in the INDONESIA to UTC time is required for flight plans and communications

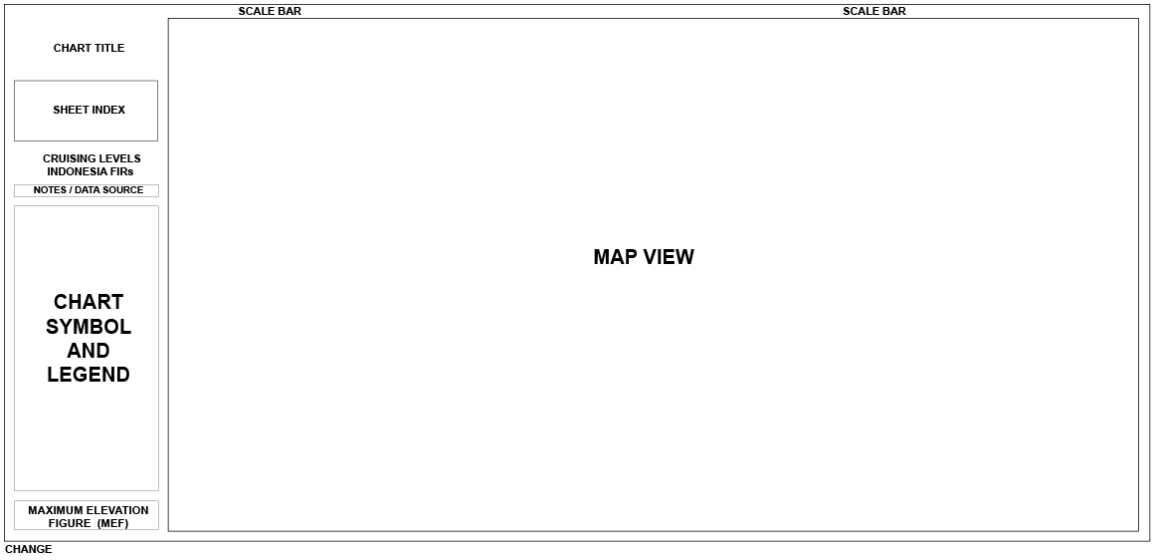
NOTE: If the local time is Daylight Savings Time, reduce the added hours by 1 Hour (4, 5, 6, 7 respectively).

Indonesia Time Zone Standard UTC:

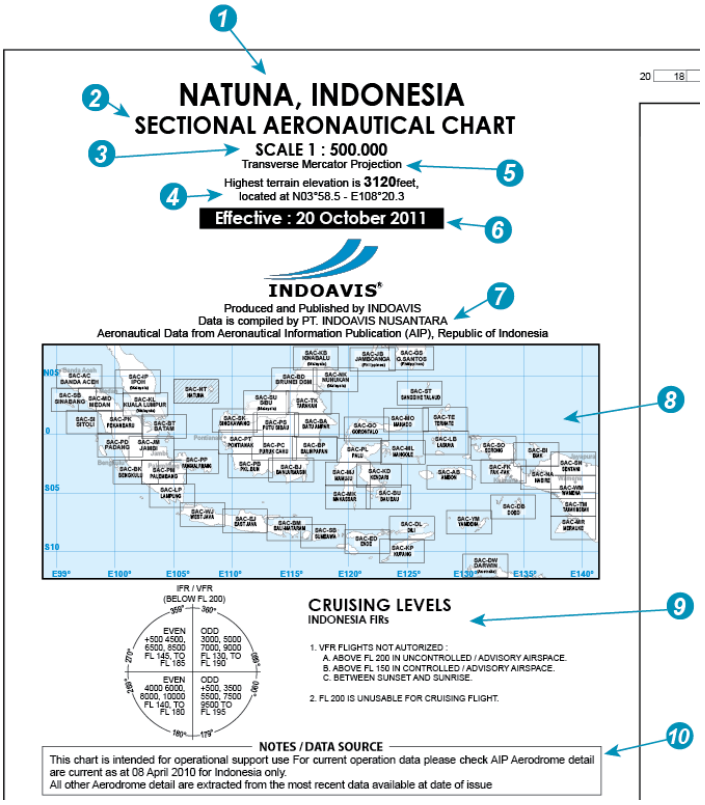
Indonesia West = UTC + 7hr
Indonesia Center = UTC + 8hr
Indonesia East = UTC + 9hr

GENERAL CHART FORMAT

SAC 1:500.000 CHART FORMAT



SAC 1:500.000 CHART TITLE



INFORMATION CHART TITLE

The data is interpreted as follows

1) Location City, Country name
2) Chart Name
3) Scale 1 : 500.000 / 1Cm = 2.7 nm / 5 km / 3.11 miles
4) Highest terrain elevation and, located at highest
5) Transverse Mercator Projection
6) Effective and publication Date
7) Product and Data compiled
8) Chart Index
9) Cruising Levels
10) Data source

CHART SYMBOLS

The following are some of the other symbols also shown on the aeronautical charts.

1. AIRPORT INFORMATIONS

Controlled Airport Legend

	**JAKARTA** **HALIM PERDANA KUSUMA INT'L** **(WIHH/HLP)** **CT - 118.3** **ATIS 128.8** **84' L 3000m**	Halim PK airports with control towers (Class B, C, D) show information about the airport in symbol ***BLUE*** lettering near the airport symbol, This type of data is typical of the airport information for Controlled airports with a control tower.

The data is interpreted as follows.

- Location City : JAKARTA
- Airport Name: HALIM PERDANA KUSUMA INTERNATIONAL
- ICAO Airport Identifier: WIHH
- IATA Airport Identifier : HLP
- Control Tower Frequency: (CT) - 118.3
- Automated Terminal Information Service (ATIS) 128.8
- Airport Altitude - 84 feet MSL
- L = Lighted
- Longest Runway = 3000m

Non-Controlled Airport Legend

	**JAKARTA** **PONDOK CABE (WIHP)** **ATIS 122.1** **200' 2200m**	Airports colored magenta on the charts have no control tower. The data associated with these airports is in magenta color also.

2. AIRPORT SYMBOLS

	Hard-surfaced runways greater than 8069' (2500m)
	Hard-surfaced runways 1500' (500m) to 8069' (2500m)
	**Military airports :** Hard-surfaced runways are depicted the same as public-use airports.
	Other than hard-surfaced runways Un-paved airport
	Sea Plane Base

2.1. Other airports with or without services

	Private airport, Heliport, Abandoned, Ultra-light Flight, Unverified.

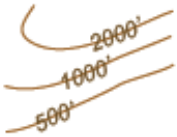
2.2. Airports Services available:

	Tick marks around the basic airport symbol indicate that fuel is available and the airport is tended during normal working hours.

Notes:
*The symbols in **Magenta** are airports without a control tower. Symbols in **Blue** have a Control Tower.*

3. TERRAIN AND OBSTRUCTIONS SYMBOLS

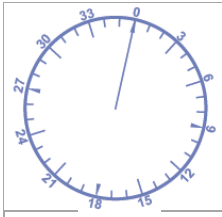
Obstruction symbols have two elevations shown near them. The one in **BOLD** letters (top number) is the elevation above mean sea level (MSL). The smaller numbers enclosed in parenthesis (bottom number) indicate the height above ground level (AGL). The symbols in the left hand column are less that 1000 feet AGL. The ones on the right are above 1000 feet AGL.

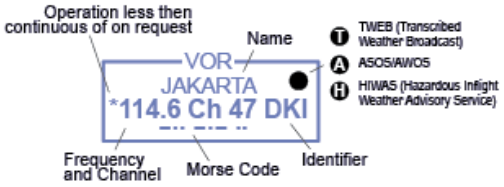
	Color tints are used to depict bands of elevation. These colors range from light green for the lowest elevations to brown for the higher elevations.  Contour lines are lines connecting points on the Earth of equal elevation. On Sectionals, basic contours are spaced at 500' and 1000' intervals.
	Shaded relief is a depiction of how the terrain might appear from the air.
MAXIMUM ELEVATION FIGURE (MEF)	Example **3100** feet 
3100	Elevation of obstacle top (MSL) highest on quadrangle latitude and longitude. **For Indoavis quadrangle Chart:** • ONC per 1° = 60Nm Chart Scale 1:1.000.000 • SAC per 30" = 30Nm. Chart Scale 1:500.000 • ANC per 15" = 15Nm. Chart Scale 1:250.000

3.1 MAN MADE OBSTRUCTION

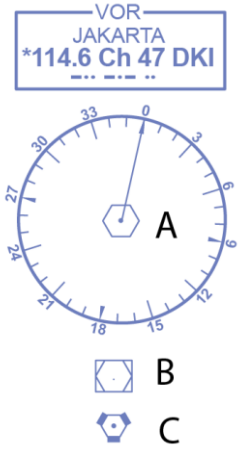
	Less than 1000' (AGL)		1000' &higher (AGL)		Group Obstruction

4. RADIO NAVIGATION SYMBOLS

	Compass	Compass Rose With Magnetic North Indicator
	VOR	VHF Omnidirectional radio range
	NDB	Non-directional radio beacon
	TACAN	UHF tactical air navigation aid
	VOR/DME	Collocated VOR and DME radio navigation aids

	VORTAC	Collocated VOR and TACAN radio navigation aids
(VOR) Nav Aids Information Box		

4.1. VHF (Very high frequency) Omnidirectional Range (VOR)



A VOR is indicated on the chart as a compass rose. It is oriented toward Magnetic North, as indicated by the long arrow extending from the center to the zero degree mark. An information box near the VOR Compass Rose provides information such as the radio frequency, 3 letter Identification Code, and the morse code of the identifier. There is other miscellaneous data that may be contained in the box.

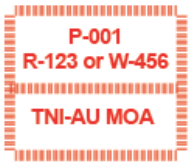
There are 3 types of VOR Ranges. They are indicated at the center of the rose.

A. **Symbol A.** VOR with no distance measuring capability.
B. **Symbol B.** VOR-DME: A VOR with distance measuring capability.
C. **Symbol C**. VORTAC: A VOR which has DME and military VORTAC capability.

4.2. Non-Directional (radio) Beacon (NDB)

A Non-directional Beacon is shown on the chart as a concentric series of green colored dots, with the center of the circle being the location of the radio station. A green colored box near the circle shown the station name, the 2 or 3 letter station ID, and the Morse code of the ID. This beacon is used by a navigation instrument in the aircraft called an "Automatic Direction Finder" (ADF).

5. AIRSPACE

	CLASS B AIRSPACE			
	CLASS C AIRSPACE			
	CLASS D AIRSPACE			
	**SPECIAL USE AIRSPACE** **P** (Prohibited), **R** (Restricted) **W** (Warning) Areas --- Military Operation Area (MOA)			
	FIR	Flight Information Region		
	ADIZ	Air Defense Identification Zone		
	Parachute Jumping Area with Frequency			Ultralight Activity
	Glider Operating Areas			Hang Glider Activity

6. LOW ALTITUDE VFR ROUTE

	Airways Route
083°	Radial route bearing are magnetic
V10 121	Airways name V = VICTOR Total mileage between point

7. TOPOGRAPHIC INFORMATION

JAKARTA	Settlement Population
	Towns and Villages
T T	Power transmission & Telecommunication lines
	Highway
	Roads Dual Lane
	Roads Primary
	Roads Secondary
station	Railroad and Station
	Ferry tracks
1250'	Mountain Pass with point Elevation of pass

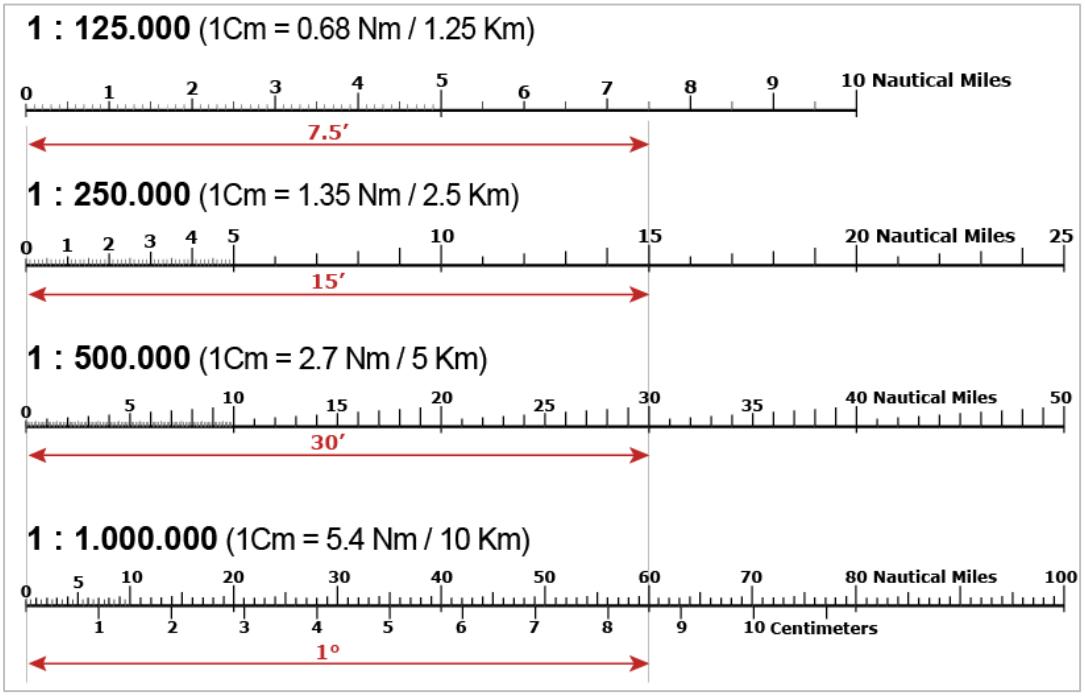
8. BOUNDARY

INDONESIA MALAYSIA	Political International
Prov. Banten Prov. West Java	State and Provincial
UTC + 6:00 UTC + 7:00	Time Zone
CAGAR ALAM WILDLIFE REFUGE	**SPECIAL CONSERVATION** National park, Wildlife Refuge, Primitives and Wilderness Areas, etc.

9. HYDROGRAPHY

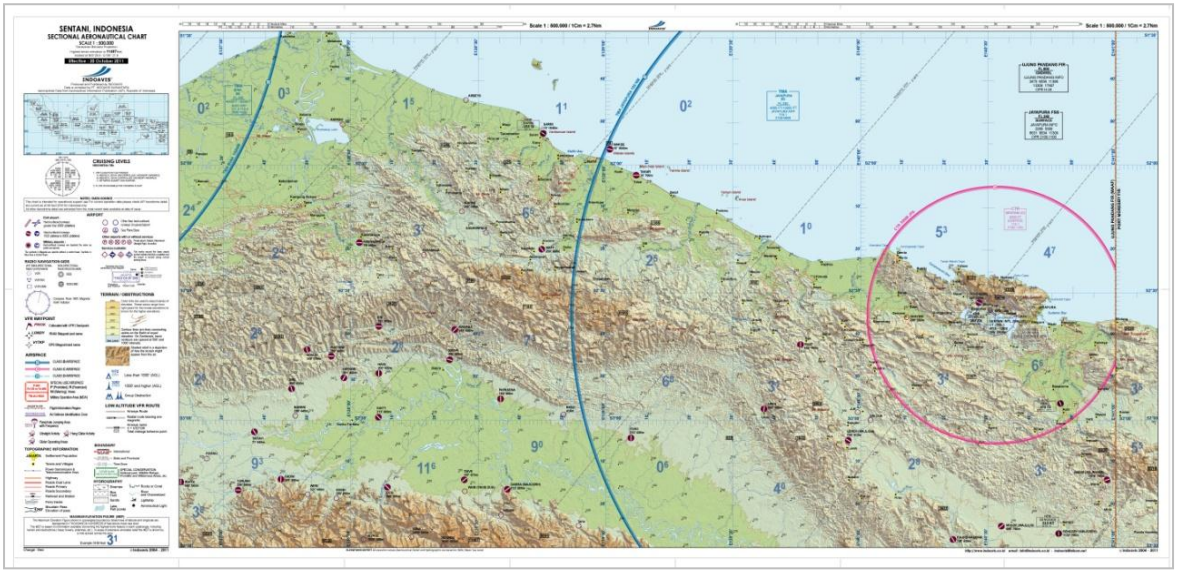
	Swamps		Rice Field
	Sands		Lake, Fish ponds
	Rocky or Coral		River and Channelized
	Lightship		Aeronautical Light

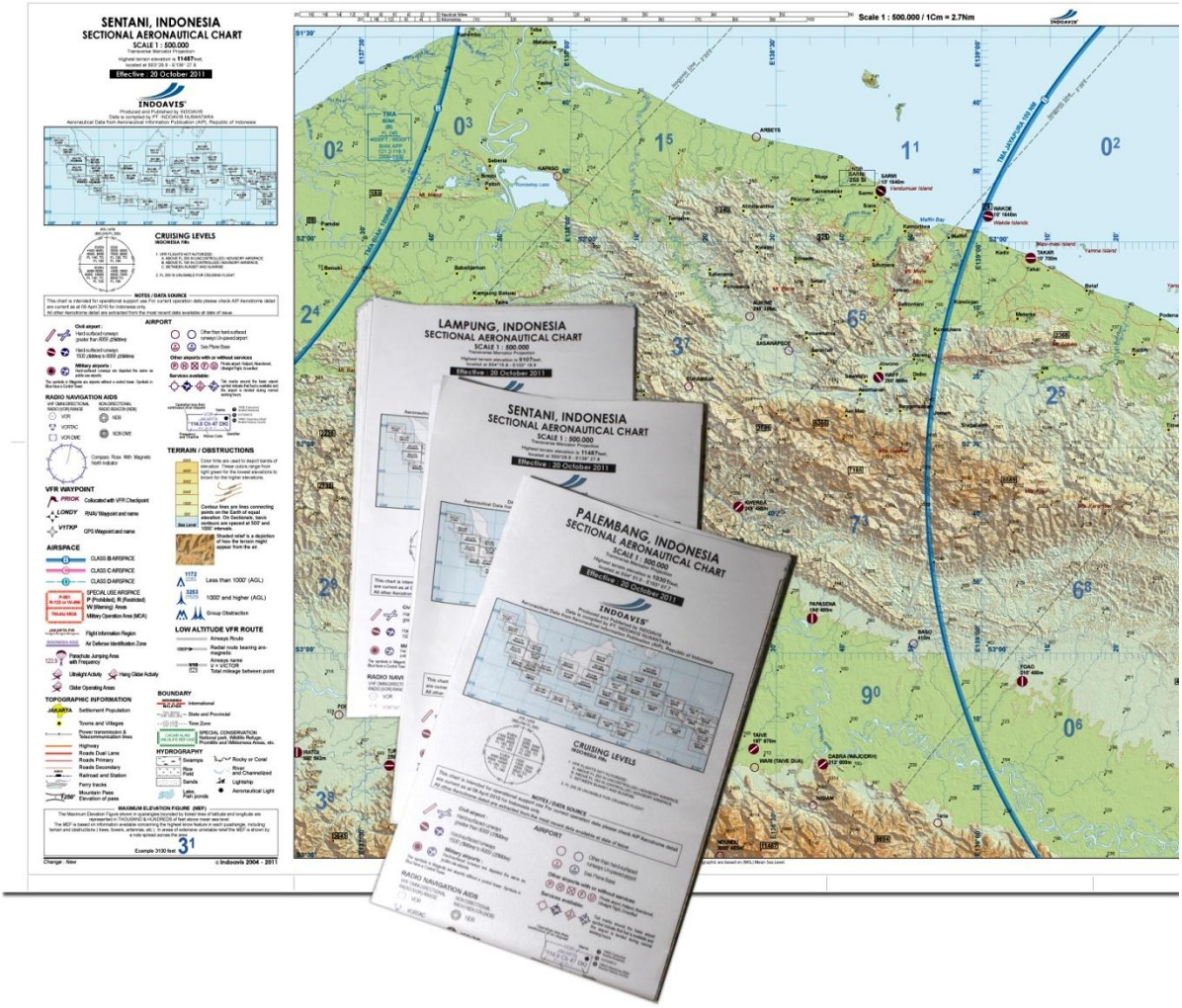
10. SCALE BAR


1 : 125.000 (1Cm = 0.68 Nm / 1.25 Km)
0 1 2 3 4 5 6 7 8 9 10 Nautical Miles
7.5'
1 : 250.000 (1Cm = 1.35 Nm / 2.5 Km)
0 1 2 3 4 5 10 15 20 Nautical Miles 25
15'
1 : 500.000 (1Cm = 2.7 Nm / 5 Km)
0 5 10 15 20 25 30 35 40 Nautical Miles 50
30'
1 : 1.000.000 (1Cm = 5.4 Nm / 10 Km)
0 5 10 20 30 40 50 60 70 80 Nautical Miles 100
1 2 3 4 5 6 7 8 9 10 Centimeters
1°

PRODUCT SAMPLE

Sample only not for navigation use





INTRODUCTION TO
INDOAVIS
AERONAUTICAL NAVIGATION
CHARTS USER'S GUIDE

5

IFR EN-ROUTE CHART LEGEND

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

INDOAVIS®

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DOC NO: INDOAVIS.UG.0I/III/2009

INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

English Version

IFR EN-ROUTE CHART LEGEND

IFR H/L ENROUTE CHART LEGEND

(Instrument Flight Rules High / low altitude En-route Chart Legend)

GENERAL

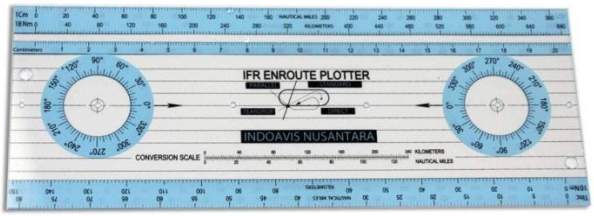
The discussions and examples in this section will be based primarily on the IFR (Instrument Flight Rule) En-route High and Low Altitude Charts. Other IFR products use similar symbols in various colors. The chart legends list aeronautical symbols with a brief description of what each symbol depicts. This section will provide a more detailed discussion of some of the symbols and how they are used on IFR charts.

INDOAVIS charts are prepared in accordance with specifications of the Interagency Cartographic, and are approved by representatives of the ICAO Doc 8697 Aeronautical Chart Manual.

IFR HIGHT/LOW ALTITUDE ENROUTE CHART are compiled and constructed using the best available aeronautical and topographical reference charts. Most Indoavis En-route Charts use the Mercator projection. The design is intended primarily for airway instrument navigation to be referenced to cockpit instruments. Charts are identified by code letters for Indonesia only areas covered by a series, by parenthetical letters for the altitude coverage, and by numbers for the individual chart. For example, INA-1 / INA2 is a chart of the Indonesia series covering both high and low altitude operations and is number 2 of the series.

MILEAGES

Most En-route and Area Chart mileages are represented on the plotter. Check the top of margin of the chart in use for the correct scale. All chart scales, and all plotter scales, are in nautical miles. Indoavis Enroute chart scale is 1Cm = 18Nm.



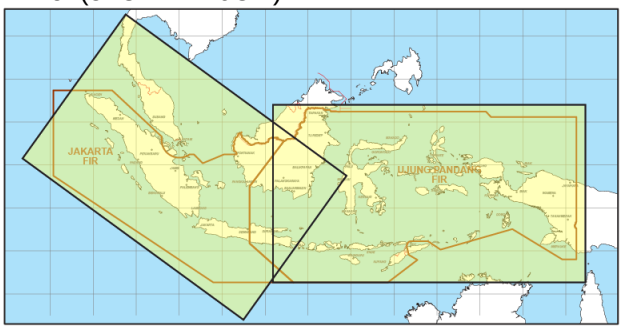
INDOAVIS IDENTIFICATION SHEET

IFR H/L Altitude EN-ROUTE Chart, Specially for Flight Navigation covering Indonesia, Singapore, Malaysia, Brunei Darussalam, Timor Leste and some part of Australian.

ENROUTE SPLIT

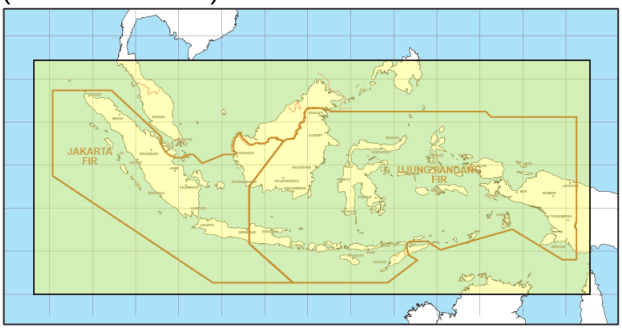
IFR H/L EN-ROUTE Split, used for Flight, divided into two sheets, INA1 for the Western region and INA2 for the Eastern region.

1. The Sheet INA-1 Is coverage area West Indonesia, Malaysia and Singapore, with the paper size of (52Cm x 110Cm).
2. The Sheet INA-2 is East Indonesia, Brunai darusalam and Timor Leste, with the paper size of (52Cm x 110Cm)



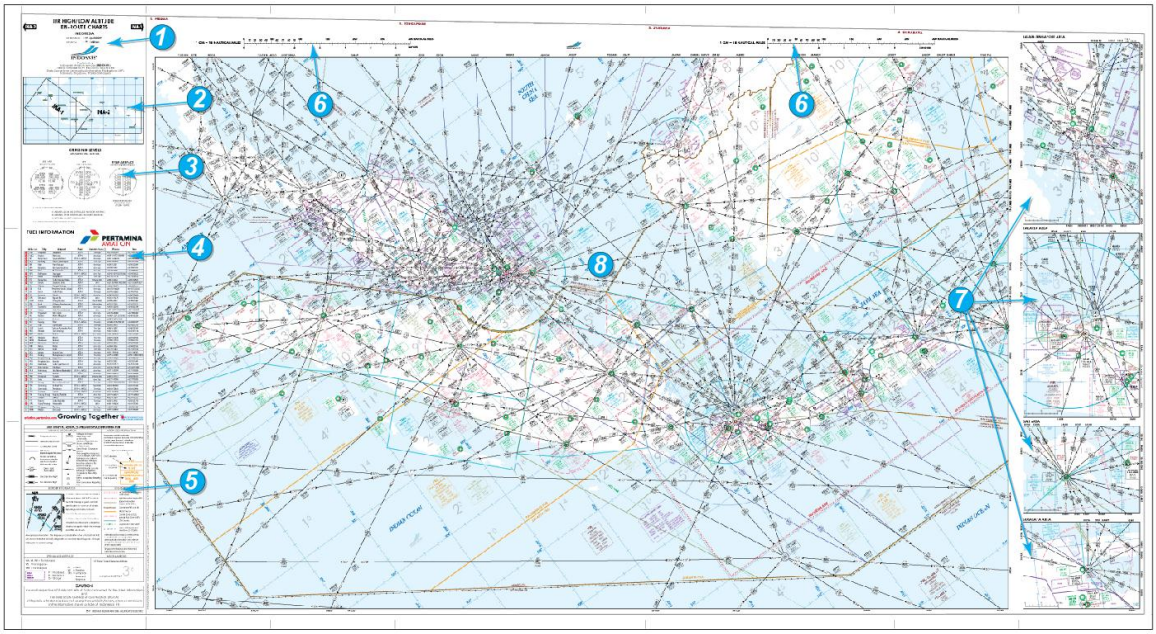
ENROUTE WALL

IFR H/L EN-ROUTE Wall used for Operation Room, covering in one sheet with the paper size of (550Cm x 210Cm)



The scale of chart is 1Cm = 18Nm.

1. CHART FORMAT



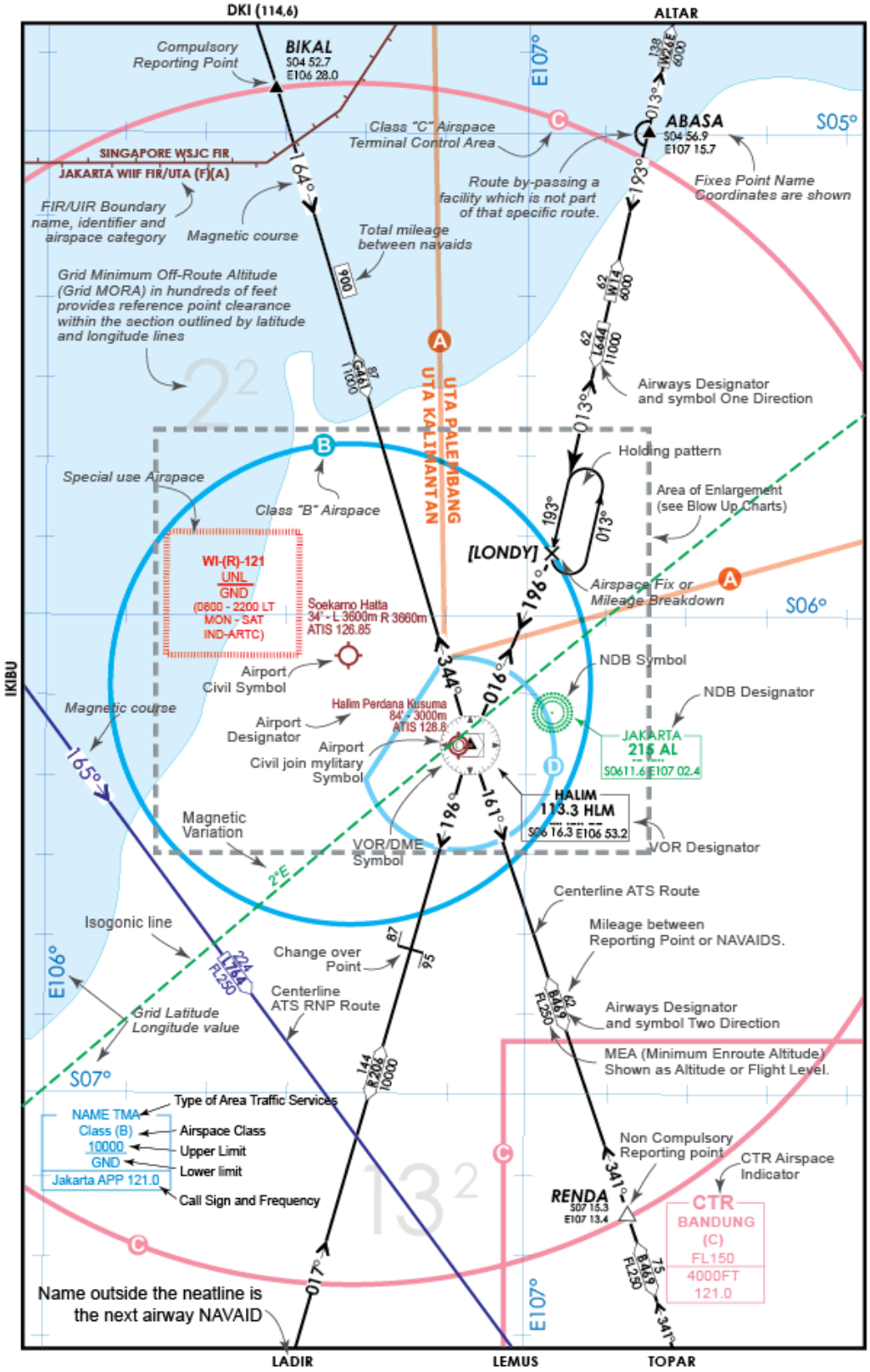
INFORMATION FORMAT INA1

The data is interpreted as follows

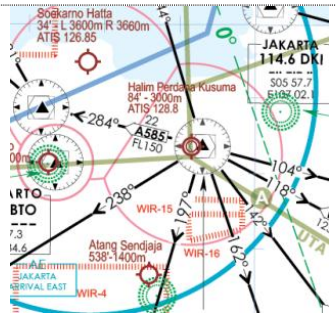
1. Chart title, Country name, Effective and Edition Dates
2. Chart Index
3. IFR Cruising Levels
4. Airport Fuel Information
5. IFR chart Legend and Symbols
6. Scale Bar in Nm and Inches / Cm
7. Enlargement of area locations
    a. Batam, Singapore
    b. Jakarta TMA Area
    c. Bali CTR Area
    d. Surabaya CTR Area
8. INA1 Map View

2. CHART LEGEND

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

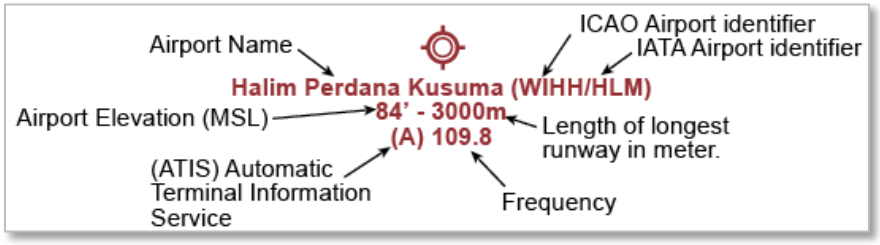


3. AIRPORT SYMBOLS

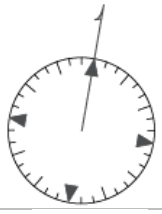
ILLUSTRATION	SYMBOL	DEFINITION
		Civil Aerodrome
		Military Aerodrome
		Join Civil military
		Abandoned Aerodrome
		Seaplane Base

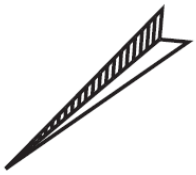
AIRPORT IDENTIFICATION

Associated city names for public airports are shown above or preceding the airport name. If airport name and city name are the same, only the airport name is shown. The airport identifier in parentheses follows the airport name.



4. NAVIGATION AIDS (NAVAID) SYMBOLS

SYMBOLS	NAME	TERMINOLOGIES
	COMPAS	The Compass Rose with magnetic North indicator, Only shown on VOR and VOR/DME. *Note: Compass Roses oriented to Magnetic North*
	VOR	VHF Omnidirectional Radio Range
	TACAN	Tactical Air Navigation
	DME	Distance Measuring Equipment
	VORDME	VHF Omnidirectional Radio Range with Distance Measuring Equipment
	VORTAC	VHF Omnidirectional Radio Range Tactical Air Navigation
	NDB	Non-directional Radio Beacon

	LOC, LDA, or SDF Front Course	ILS or Localizer is show if available at airport. --------- LOC ; Localizer LDA ; Localizer-type Directional Aid SDF ; Simplified Directional Facility

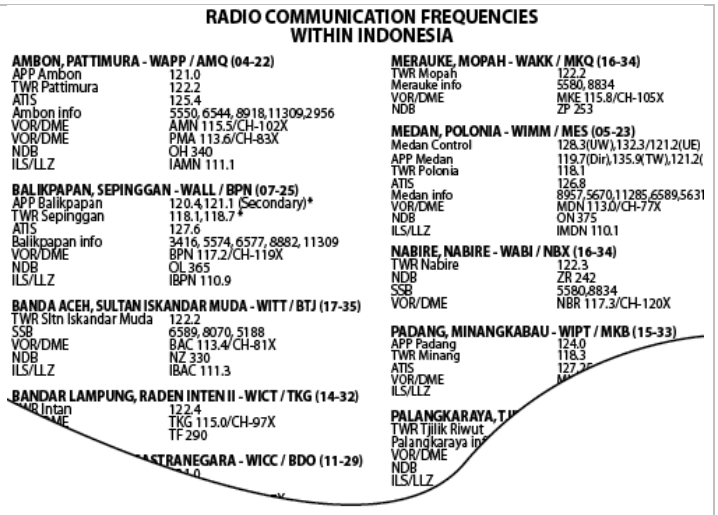
NAVAID IDENTIFICATION

	VOR / VORDME or VORTAC identification component, with frequency, identifier, and Morse Code & coordinates. DME capability is indicated by a small “D” preceding the VOR frequency at frequency paired navaids. VOR and VORTAC navaid operational ranges are identified (when known). On High/Low altitude Enroute Charts, geographical coordinates (latitude and longitude) are shown for navaids forming high or all altitude airways and routes.
	NDB identification component is give in green color when naviad is airways or route component, with frequency, identifier, and Morse Code and coordinates

5. RADIO COMMUNICATION FREQUENCIES

Communications frequencies for the major airports shown on an Area Chart are given in block as illustrate in the left side.

- Call (Identification of location) and frequencies of Control Service for use within list location Radio Frequency Aerodrome
- Call sign CONTROL” and / or “RADAR”
- is omitted in all communication list in several regions.



RADIO COMMUNICATION FREQUENCIES
WITHIN INDONESIA

AMBON, PATTIMURA - WAPP / AMQ (04-22)

APP Ambon	121.0
TWR Pattimura	122.2
ATIS	125.4
Ambon info	5550, 6544, 8918, 11309, 2956
VOR/DME	AMN 115.5/CH-102X
VOR/DME	PMA 113.6/CH-83X
NDB	OH 340
ILS/LLZ	IAMN 111.1

BALIKPAPAN, SEPINGGAN - WALL / BPN (07-25)

APP Balikpapan	120.4,121.1 (Secondary)*
TWR Sepinggan	118.1,118.7 *
ATIS	127.6
Balikpapan info	3416, 5574, 6577, 8882, 11309
VOR/DME	BPN 117.2/CH-119X
NDB	OL 365
ILS/LLZ	IBPN 110.9

BANDA ACEH, SULTAN ISKANDAR MUDA - WITT / BTJ (17-35)

TWR Sltn Iskandar Muda	122.2
SSB	6589, 8070, 5188
VOR/DME	BAC 113.4/CH-81X
NDB	NZ 330
ILS/LLZ	IBAC 111.3

BANDAR LAMPUNG, RADEN INTEN II - WICT / TKG (14-32)

TWR Intan	122.4
	TKG 115.0/CH-97X
	TF 290

...STRANEGARA - WICC / BDO (11-29)

MERAUKE, MOPAH - WAKK / MKQ (16-34)

TWR Mopah	122.2
Merauke info	5580, 8834
VOR/DME	MKE 115.8/CH-105X
NDB	ZP 253

MEDAN, POLONIA - WIMM / MES (05-23)

Medan Control	128.3(UW),132.3/121.2(UE)
APP Medan	119.7(Dir),135.9(TW),121.2(
TWR Polonia	118.1
ATIS	126.8
Medan info	8957,5670,11285,6589,5631
VOR/DME	MDN 113.0/CH-77X
NDB	ON 375
ILS/LLZ	IMDN 110.1

NABIRE, NABIRE - WABI / NBX (16-34)

TWR Nabire	122.3
NDB	ZR 242
SSB	5580,8834
VOR/DME	NBR 117.3/CH-120X

PADANG, MINANGKABAU - WIPT / MKB (15-33)

APP Padang	124.0
TWR Minang	118.3
ATIS	127.2...
VOR/DME	M...
ILS/LLZ	

PALANGKARAYA, T...

TWR Tjilik Riwut	
Palangkaraya In...	
VOR/DME	
NDB	
ILS/LLZ	

6. SPECIAL USE AIRSPACE

	Special use airspace. The accompanying label indicates it as prohibited, restricted, danger, etc. (T) Training, (A) Alert, (C) Caution, and Military Operations Areas (MOAs).

WI-(R)-121
UNL
GND
(0800 - 2200 LT
MON - SAT
IND-ARTC)

WI	Country identifier WI : Indonesia, WS : Singapore WM : Malaysia YB : Australia	(A)	Alert
(R)	Restricted _____→	(T)	Training
121	designation number	(C)	Caution
UNL	Unlimited (Upper Limit)	(W)	Warning
GND	Ground (Lower Limit)	(D)	Danger
0800-2200	Hours active	(P)	Prohibited
MON-SAT	Day active	(R)	Restricted
IND-ARTC	Controlling Agency	(TRA)	Temporary Reserved Airspace
		(TSA)	Temporary Segregated Area
		(MOA)	Military Operations Area

7. ROUTE COMPONENTS AND AIRWAYS INFORMATION

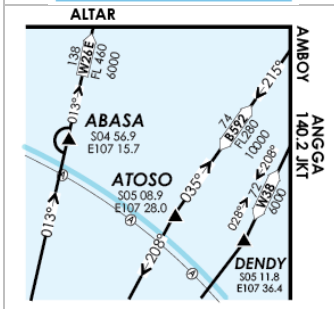
	Airways Route	W32N	Airway and route designators two direction flight
	Diversionary Route	W32N	Airway and route designators single direction flight
	RNP Airway/Route	900	Total mileage between NAVAIDS
	Route by-passing a facility which is not part of that specific route.	9000 FL 40	MEA (Minimum Enroute Altitude) Shown as Altitude or (FL) Flight Level.
139°	NAVAIDS radial & route bearings (magnetic).	D	Direct track Clearance by ATC
	Altitude Change MEA/MOCA Change at other NAVAIDs	87	Mileage between Reporting Point or NAVAIDS.
87 95	COP (Change Over Point) between two stations is indicated by mileages from the station to the point of change.		Scale-break (On ATC Route)

8. REPORTING FIXES POINT

	IFR Compulsory Reporting Point		RNAV Compulsory Reporting Point
	VFR Compulsory Reporting Point		RNAV Non-Compulsory Reporting Point
	IFR On request Report Reporting Point		Mileage Breakdown
	VFR On request Report Reporting Point	CEGER S08 31.4 E138 25.0	Intersection name, Coordinates are shown
	ATS/MET Reporting Point Compulsory Report	D31/39	Holding Pattern. DME figures, when provided, give the DME distance of the fix as the first figure followed by the outbound limit as the second figure.
	ATS/MET Reporting Point On request Report		

9. BOUNDARIES AND LINES / IDENTICATION

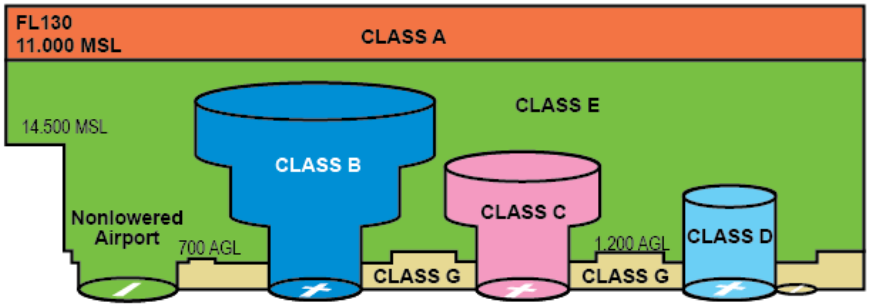
	Air Defense Identification Zone (ADIZ)
	Flight Information Region (FIR).
	Upper Information Region (UIR) Upper Control Areas (UTA).
	International boundary.
Central +6 UTC Eastern +5 UTC	Time zone boundary.
QNH QNE	QNH/QNE boundaries.
2°E	Magnetic variation isogonic lines are indicated at the edge of the chart or are extended fully across the chart in a continuous dashed line.

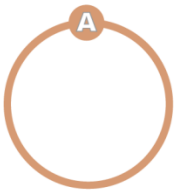
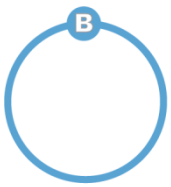
	Area of Enlargement (see Blow Up Charts)
BANDUNG TMA Class (B) 10000 GND Bandung APP 121.0	Type of Area Traffic Services Airspace Class Upper Limit Lower limit Call Sign and Frequency
	Name outside the neatline is the next airway NAVAID to which the total mileage is given. NAVAID identification is shown on all charts. Reporting point name is shown when it is the airway termination Name inside the neat line is the first reporting point outside the chart coverage to which the mileage and MEA are shown. Airway lead information : the frequency and identifier of an offchart NAVAID are shown when the NAVAID designates an on-chart reporting point, change over point or crourse change.

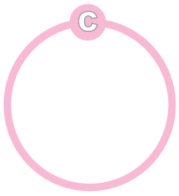
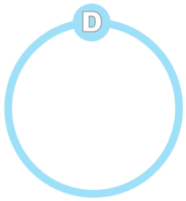
10. AIRSPACE CLASSIFICATIONS

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

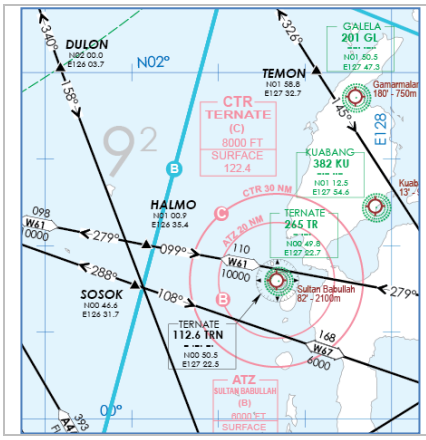
INDONESIAN AIRSPACE CLASSES



	**CLASS A** Airspace; Class A Airspace is the airspace from FL110 (11,000) feet to FL130 (13,000). All pilots flying in Class A airspace shall file an Instrument Flight Rules (IFR) flight plan and receive an appropriate air traffic control (ATC) clearance. When climbing through 11,000 feet, the pilot will change the altimeter setting from the local altimeter (30.01 for example) to 29.92. This ensures all aircraft flying in class A airspace have the same altimeter setting and will have proper altitude separation.
	**CLASS B** Airspace; Class B Airspace is generally the airspace from the surface to 10,000 feet. This airspace is normally around the busiest airports in terms of aircraft traffic. Class B airspace is individually designed to meet the needs of the particular airport and consists of a surface area and two more layers. Most Class B airspace resemble an upside down wedding cake. Pilots must contact air traffic control to receive an air traffic control clearance to enter Class B airspace. Once a pilot receives an air traffic control clearance, they receive separation services from other aircraft within the airspace.

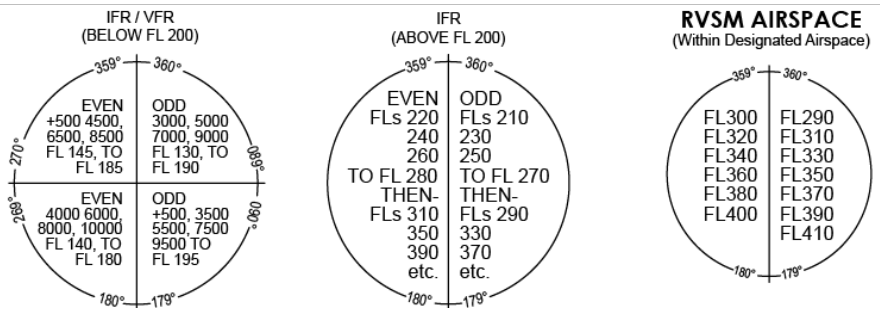
	**CLASS C** Airspace; Class C Airspace is the airspace from the surface to 4,000 feet above the airport elevation. Class C airspace will only be found at airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations. Although Class C airspace is individually tailored to meet the needs of the airport, the airspace usually consists of a surface area with a 5 nautical mile (NM) radius, an outer circle with a 10 NM radius that extends from 1,200 feet to 4,000 feet above the airport elevation and an outer area. Pilots must establish and maintain two-way radio communications with the ATC facility providing air traffic control services prior to entering airspace. Pilots of visual flight rules (VFR) aircraft are separated from pilots of instrument flight rules (IFR) aircraft only. Anchorage International airport.
	**CLASS D** Airspace; Definition. Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures.

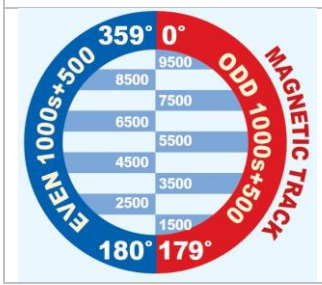
11. ORIENTATION



- Geographical Grid lines and Value
- Large inland
- Grid Minimum Off-Route Altitude
- Grid shown at the intersection of units of latitude and longitude or by complete line.
- Shorelines and large inland lakes are shown.
- Grid Minimum Off-Route Altitude (Grid MORA) in hundreds of feet provides reference point clearance within the section outlined by latitude and longitude lines. Grid MORA values followed by a +/- denote doubtful accuracy, but are believed to provide sufficient reference point clearance

12. CRUISING ALTITUDES





1. **VFR FLIGHTS NOT AUTHORIZED**
   a. Above FL200 in uncontrolled / Advisory airspace
   b. Above FL150 in controlled / Advisory airspace
   c. Between Sunset and sunrise.

2. **FL 200 IS UNUSABLE FOR CRUISING FLIGHT.**

RVSM AIRSPACE AND TRANSITION AREA (FL290 - FL410)

INTRODUCTION TO
INDOAVIS
AERONAUTICAL NAVIGATION
CHARTS USER'S GUIDE

6

INSTRUMENT APPROACH CHART LEGEND

INDOAVIS®

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

INDOAVIS®

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DOC NO: INDOAVIS.UG.0I/III/2009

INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

English Version

INSTRUMENT APPROACH CHART LEGEND

INSTRUMENT APPROACH CHART LEGEND

FUNCTION

This chart shall provide flight crews with information which will enable them to perform an approved instrument approach procedure to the runway of intended landing including the missed approach procedure and where applicable, associated holding patterns.

> *Note.— Detailed criteria for the establishment of instrument approach procedures and the resolutions of associated altitudes/heights are contained in the* Procedures for Air Navigation Services — Aircraft Operations *(PANS-OPS,Doc 8168).*

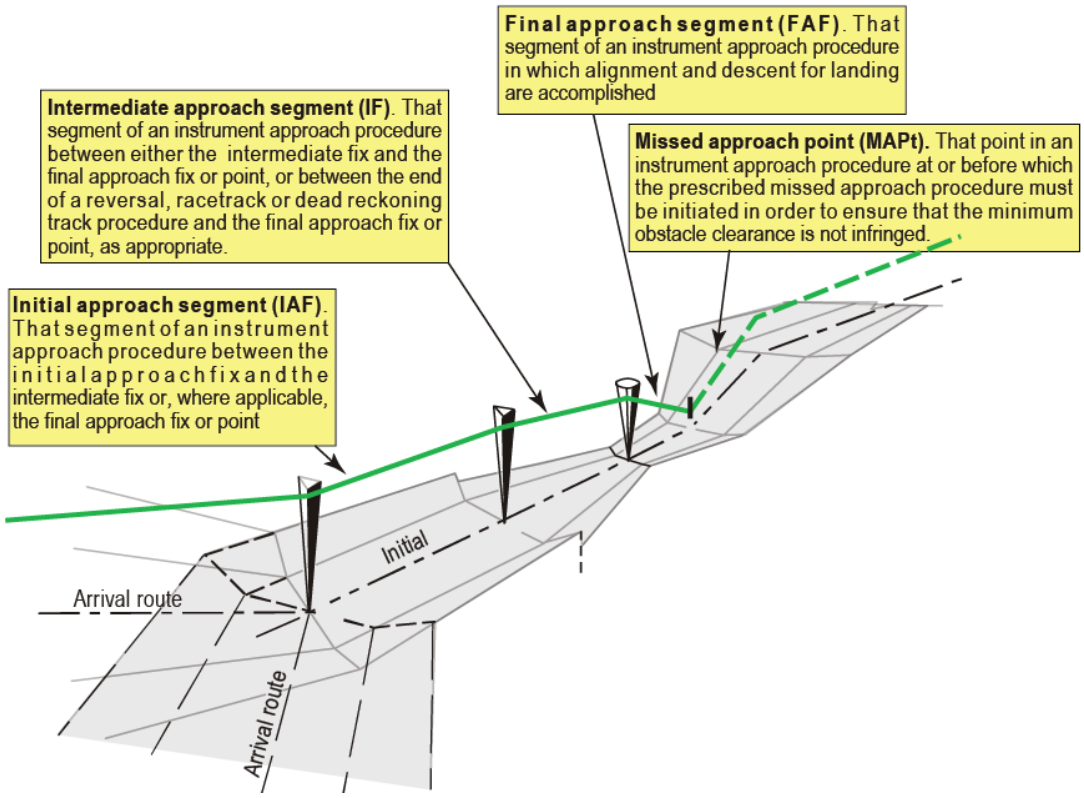
Anatomy of Instrument Approaches

In Indonesia, instrument approaches are developed by Directorate General of Civil Aviation (DGCA) in accordance with the publication AIP, and are published in the government publication.

There are two broad categories of instrument approaches

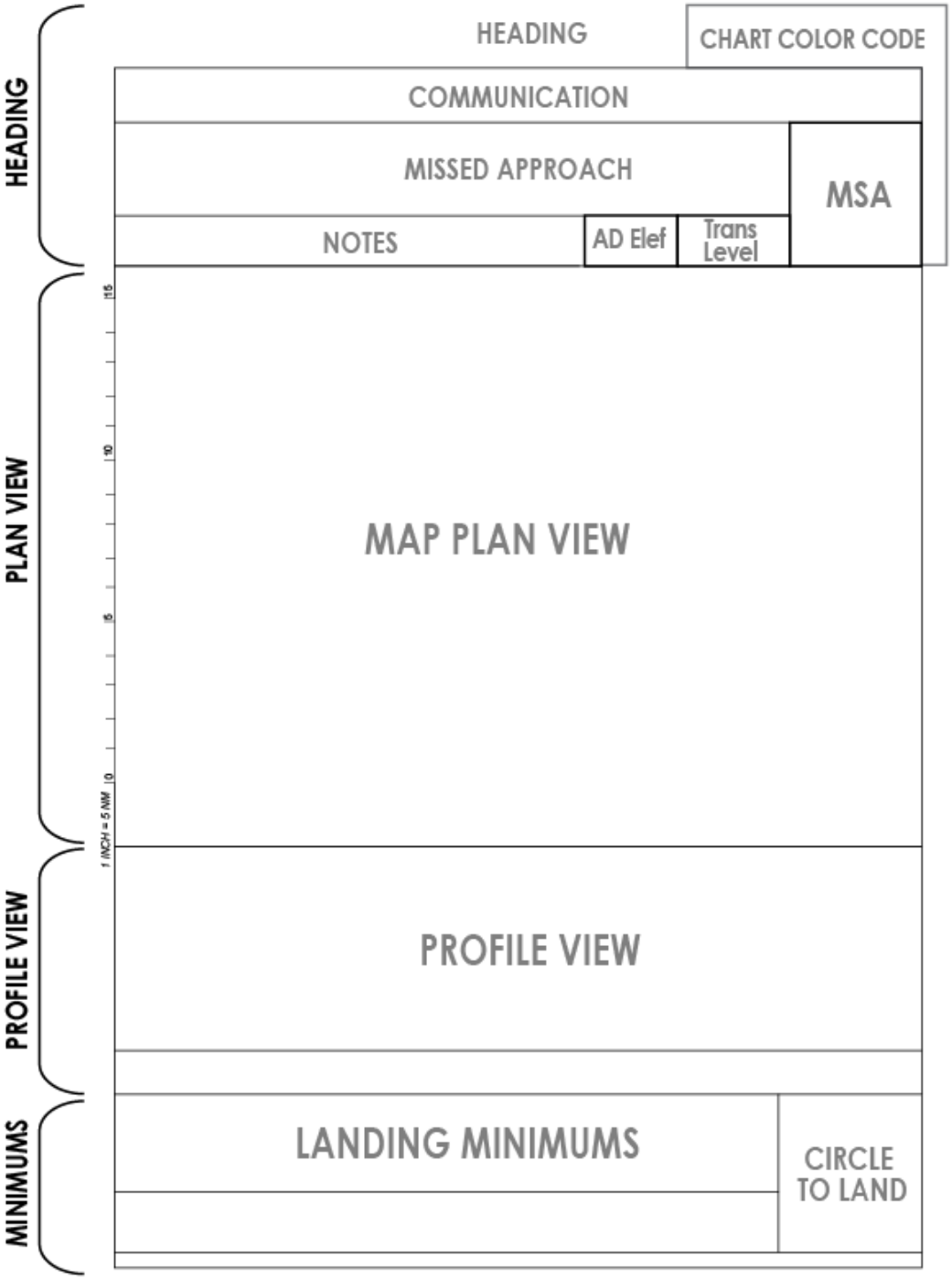
1) Precision approaches and
2) Non-precision approaches.

The Four Instrument Approach Segments

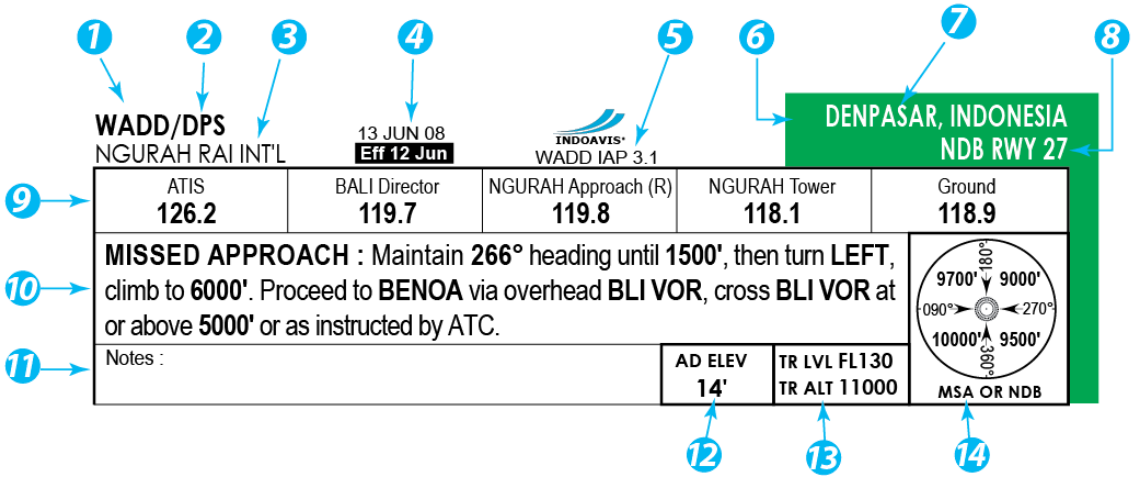


GENERAL CHART FORMAT

The four step of Indoavis chart layout



H E A D I N G

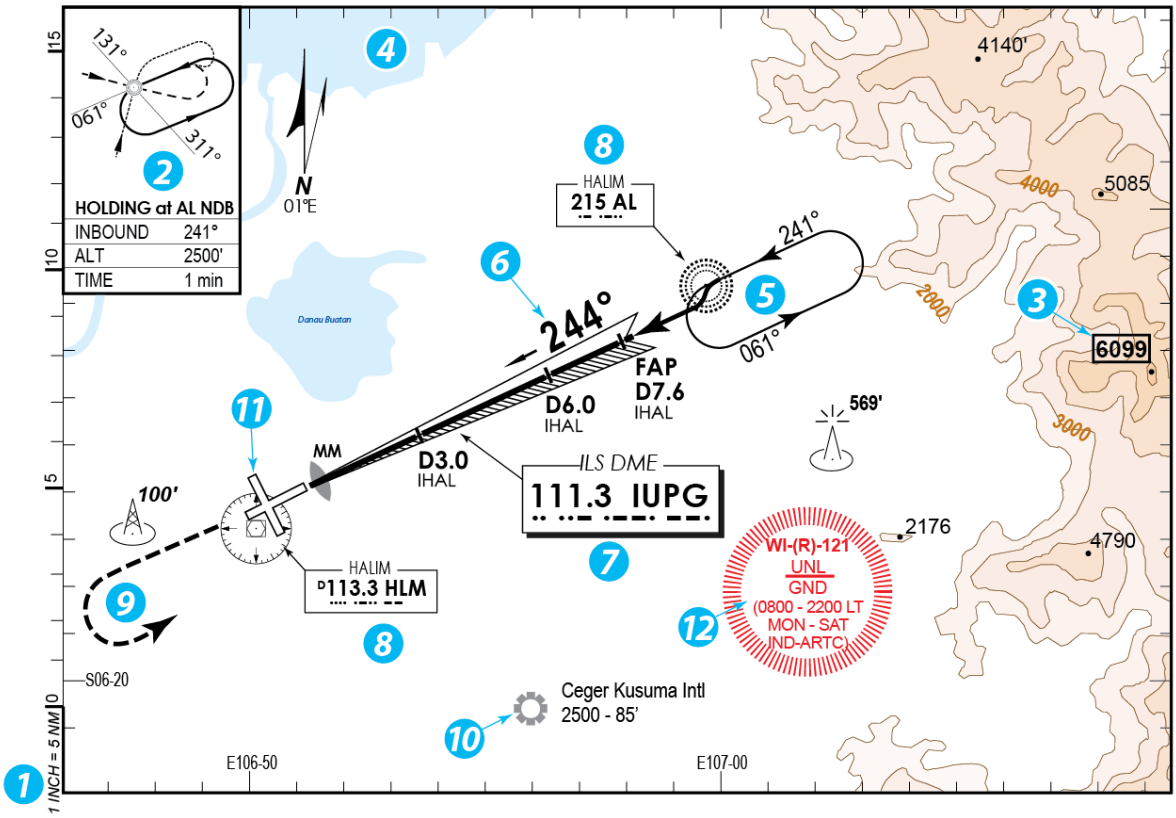


OVERVIEW OF HEADING FEATURES

1) ICAO Airport code identifier
2) IATA Airport code identifier
3) Airport name
4) AIRAC Date publication
5) Index number, Chart are sequenced by type
6) **Chart color code**, Individual INDOAVIS charts are identified on both the top color of the page by their procedure name (based on the NAVAIDs (Green is NDB, Blue is VOR or VOR/DME, ILS is Magenta and brown is GPS/GNSS)

7) Location City-Country name
8) Procedure Identification
9) **Communication frequencies**, Pilots typically refer to the next rows from top to bottom to set up and brief the approach. The communications section of the format is arranged horizontally in the top row.
    a. ATIS : ATIS Arrival Frequency
    b. DIRECTOR : Director Call and Frequency
    c. APPROACH : Approach Control Call and Frequency
    d. (R) : Radar available
    e. TOWER : Tower Call and Frequency
    f. GROUND : Ground Call and Frequency
10) Missed Approach instruction
11) Notes application to the approach procedure.
12) Aerodrome Elevation
13) **Transition Level (FL) (QNE) and Transition Altitude (FT) (QNH),** Transition Level and Transition Altitude are provided for all areas in Indonesia.
14) **Minimum Safe altitude (MSA)** Altitudes are protected to a 25 Nautical mile radius unless special otherwise. Altitude depicted on (IAP, SID and STAR Chart) and identified as the minimum altitude which provide a 1.000ft obstacle clearance
    a. Arrows on distance circle identify sector
    b. Facility identifier

PLAN VIEW
Briefing Sequence

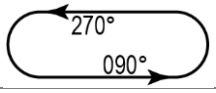


OVERVIEW OF HEADING FEATURES

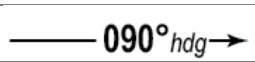
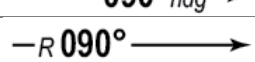
1) Scale Bar (inch / kilometers to Nautical miles)
2) Entry holding with fix point, altitude and time
3) Highest reference point with the plan view show in box
4) Drainage River and water features
5) Holding pattern, Holding pattern not part of the approach procedure.
6) Final approach course bearing is enlarged and made bold.
7) Primary navaid information enlarged and made bold and bold type and a shadow box for easy recognition.
8) Secondary navaid information
9) Missed approach track
10) Nearby Civil or joint Military airport
11) Airport
12) Restricted airspace The accompanying label indicated it as prohibited, restricted, danger, etc

APPROACH CHART LEGEND
PLAN VIEW SYMBOLS

1. PROCEDURE TRACKS

	Approach procedure track
	Missed approach procedure track
	Holding track including bearing direction value.

2. BEARING TRACKS

	Magnetic course
	True course
	Magnetic heading
	Magnetic radial

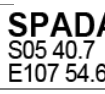
3. RADIO NAVIGATION AIDS

	LOC/LDA/SDF/MLS	Transmitter (Shown when installation is offset from its normal position off the end of the runway)
	LOC/DME	Collocated LOC and DME radio navigation aids
	VOR	VHF omnidirectional radio range
	NDB	Non-directional radio beacon
	TACAN	UHF tactical air navigation aid
	DME	Distance measuring equipment
	VOR/DME	Collocated VOR and DME radio navigation aids
	VORTAC	Collocated VOR and TACAN radio navigation aids
ILS Instrument landing system	ILS, LOC. LDA, SDF, MLS or KRM	
	LOC	
	Elliptical	Radio marker beacon MM (Middle Marker) OM (Outer Marker
	Bone Shape	
	Compass rose	4. Compass rose To be orientated on the chart in accordance with the alignment of the station (normally Magnetic North), **5.** Compass rose to be used as appropriate in combination with the following symbols: (VOR, VOR/DME, TACAN, VORTAC)

6. RADIO NAVIGATION AIDS INFORMATION

ILS, LOC, LDA, SDF, MLS (primary) VOR, VOR/DME (Primary) NDB (Secondary)		Navaid facility boxes include facility name, identity, Morse code and frequency. The shadow indicates the primary facility. In VOR/DME and VORTAC facility boxes the letter “D” Indicate DME and “H” High Altitude when available.

7. AIRSPACE FIXES

	RPC	Reporting Point (Compulsory)
	RPR	Reporting Point (On-Request)
	RNAV	RNAV Point (Compulsory)
	RNAV	RNAV Point (On-Request)
	DME	DME Distance
	MB	Mileage Breakdown
	WPT	Flyover Waypoint
	WPT	Fly-by Waypoint
	DME info	DME value Navaid name
	FIX POINT Info	Fixes Point Name Coordinates are shown

8. ALTITUDE

	MANDATORY	Mandatory altitude in line cross at.
	MINIMUM	Minimum altitude in line cross at or above
	MAXIMUM	Maximum altitude in line cross at or below
	RECOMENDED	Recomended altitude

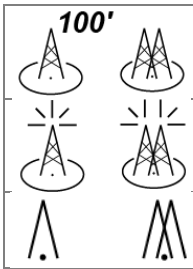
9. AIRPORT

	AIRPORT	Airport to the approach
	MILITARY	Nearby Military airport
	JOIN CIVIL MILITARY	Nearby Civil or joint Military airport

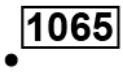
	HELIPORT	Heli Landing site A white letter H indicates an area reserved for take-off and landing helicopters.
	SEAPLANE	Military and Civil Seaplane Base

10. OBSTACLE

10.1 MAN-MADE STRUCTURES

	Tower Unlighted	Man-made structure.
	Tower Lighted	Man-made structure.
	Obstacle Structure	Unidentified man-made structure

10.2 TERRAIN HIGH POINTS

	Spot Elevation	Mean Sea Level (MSL) elevation at top of terrain high point/man-made structure.
	Spot Elevation	unsurveyed accuracy
	Spot highest elevation	Box indicates only the highest of portrayed terrain high point and man-made structures may exist which have not been portrayed.
		Generalized terrain contour information. The Gradient tints indicate the elevation change between contour intervals

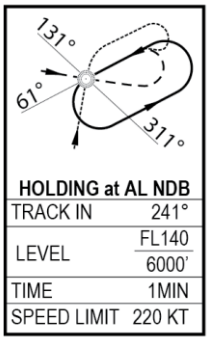
11. RESTRICTED AIRSPACE

	Restricted airspace. The accompanying label indicates it as prohibited, restricted, danger, etc. (T) Training, (A) Alert, (C) Caution, and Military Operations Areas.	
WI-(R)-121 UNL GND (0800 - 2200 LT MON - SAT IND-ARTC)	**WI** Country identifier WI : Indonesia, WS : Singapore WM : Malaysia YB : Australia **(R)** Restricted _____→ **121** designation number **UNL** Unlimited (Upper Limit) **GND** Ground (Lower Limit) **0800-2200** Hours active **MON-SAT** Day active **IND-ARTC** Controling Agency	(A) Alert (T) Training (C) Caution (W) Warning (D) Danger (P) Prohibited (R) Restricted (TRA) Temporary Reserved Airspace (TSA) Temporary Segregated Area (MOA) Military Operations Area

12. MAGNETIC BEARING

Bearing magnetic variation
Magnetic declination is the angle between magnetic north (the direction the north end of a compass needle points) and true north. The declination is positive when the magnetic north is east of true north. The term **magnetic variation** is a synonym

13. HOLDING ENTRY

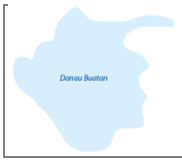


Type entry holding

- **Holding Fix**
- **Holding Inbound**
- **Holding Altitude**
- **Holding Time**
- **Holding Speed**

- **Notes :**
- **Holding Patterns are generally not charted to scale**
- **Holding Pattern not part of the approach procedure.**

14. ORIENTATION DETAIL

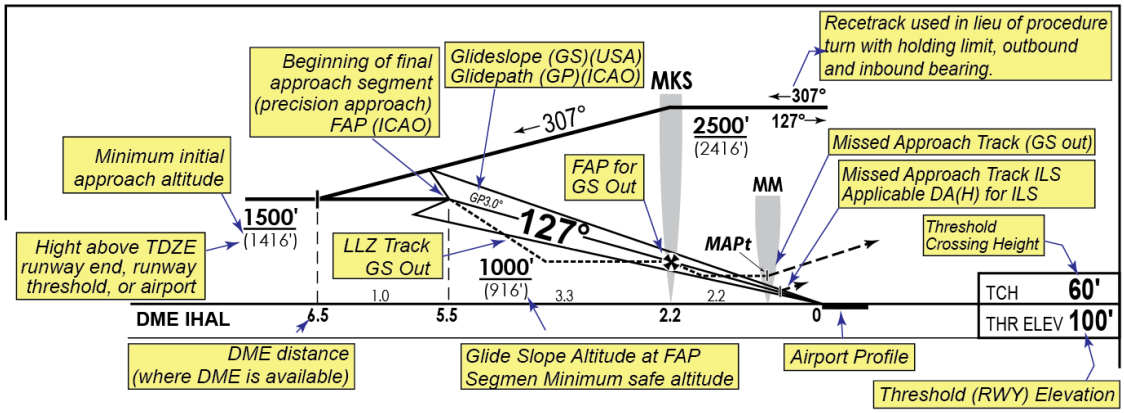


Lake or large water areas

River

APPROACH CHART LEGEND PROFILE VIEW

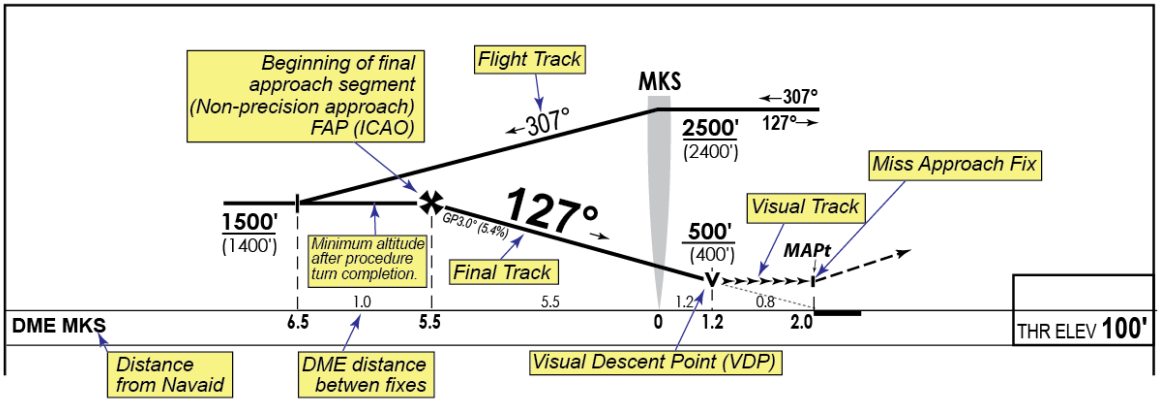
PRECISION APPROACH PROFILE (ILS with LOC (GP out), or with NDB Approach



Type procedure for Precision approaches systems

- ILS Instrument Landing System
- MLS Microwave Landing System
- PAR Precision Approach Radar (Military)
- GPS (with vertical navigation via WAAS or EGNOS) - Global Positioning System
- LAAS Ground Based Augmentation System (GBAS) for (GNSS)
- JPALS Joint Precision Approach and Landing System
- GCA Ground-Controlled Approach (mostly military)

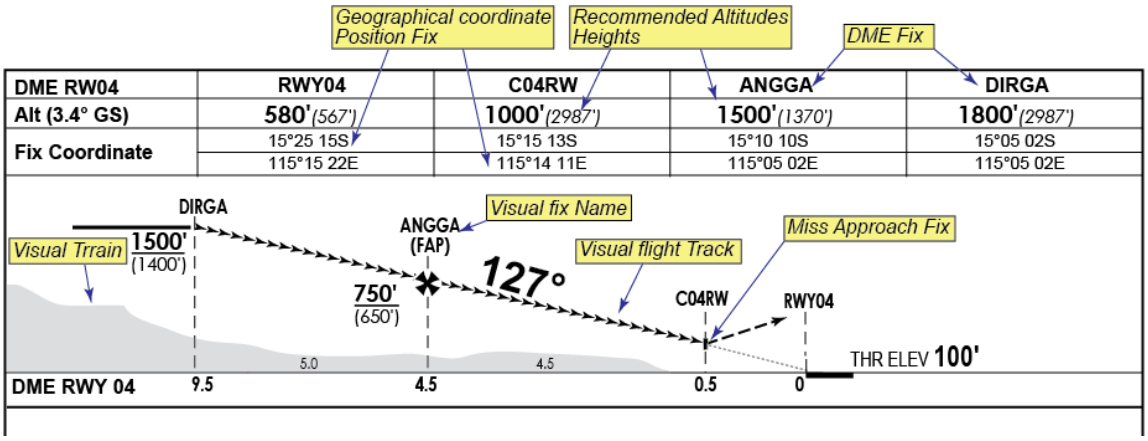
NON - PRECISION APPROACH PROFILE (LOC, VOR, VORTAC, NDB)



Type of Non-precision approaches systems

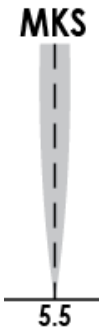
- Localizer (LOC)
- VOR / VORDME
- NDB, Non-Directional Beacon
- Localizer Type Directional Aid or LDA
- Simplified Directional Facility or SDF
- GPS - Global Positioning System
- TACAN
- SRA - Surveillance Radar Approach

NON - PRECISION APPROACH PROFILE (VISUAL APPROACH)

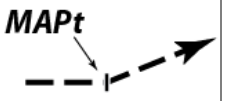
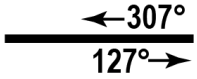


APPROACH CHART LEGEND
PROFILE SYMBOLS

1. MARKER BAECON

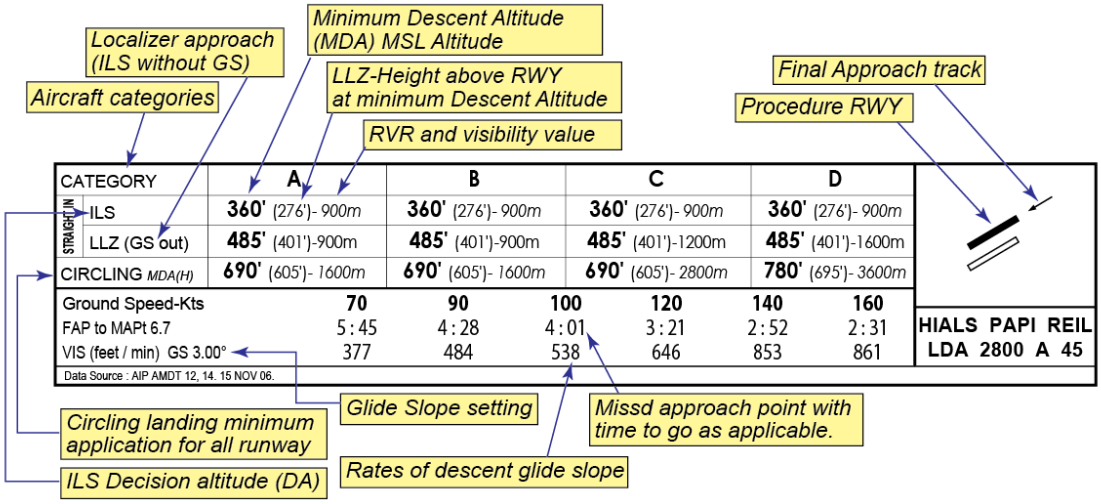
	Radio navigation aid (type of aid and its use in the procedure to be annotated on top of the symbol)		Radio marker beacon (type of beacon to be annotated on top of the symbol)
	**DME fix** (distance from DME and the fix use in the procedure to be annotated on bottom of the symbol)		Collocated DME fix and marker beacon (distance from DME and the type of beacon to be annotated on top of the symbol)

2. TRACK SYMBOL

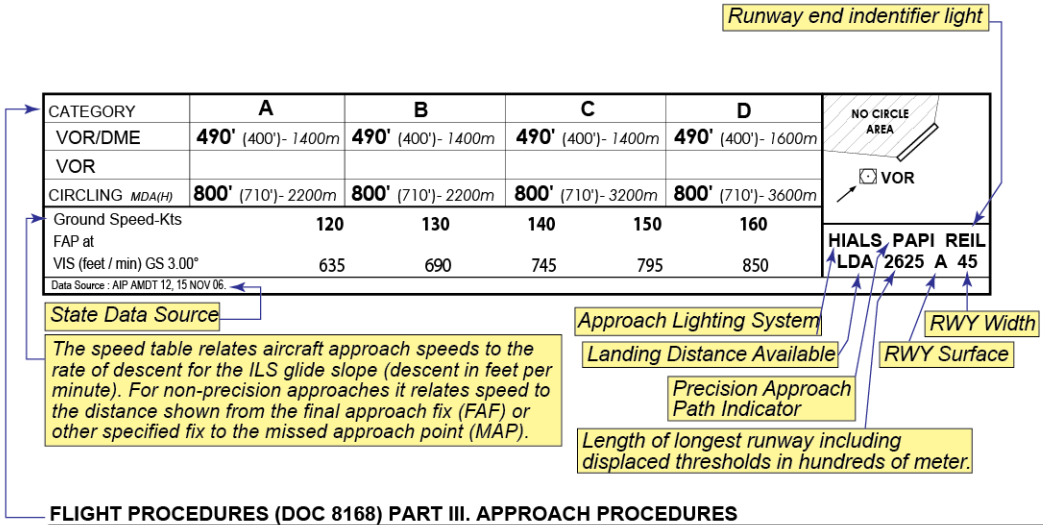
	Approach procedure flight track		Visual procedure flight track
	Missed approach track		Distance fixed
	Missed approach fix		Airport profile
	Final Approach Fix (FAP) (for non-precision approaches)		Visual Descent Point (VDP)
	Racetrack used in lieu of procedure turn with holding limit, outbound and inbound bearing.		

APPROACH CHART LEGEND
LANDING MINIMUMS

PRECISION APPROACH PROFILE (ILS with LOC / GP out)



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



FLIGHT PROCEDURES (DOC 8168) PART III. APPROACH PROCEDURES

Aircraft Category		A	B	C	D	E
SPEED (V at)		< 90kt (169km/h)	91/120kt (169/223km/h)	121/140kt (224/260km/h)	141/165kt (261/306km/h)	166/210kt (307/390km/h)
Range of speeds for initial approach (kt)		120/150 (110*)	120/180 (140*)	160 / 240	185 / 250	185 / 250
Range of final approach speed (kt)		70 / 100	85 / 130	115 / 160	130 / 185	155 / 230
Max speed for visul maneuvering (Circling)		100kt (185km/h)	135kt (250km/h)	180kt (335km/h)	205kt (380km/h)	240kt (445km/h)
Max speed for Miss approach	Intermediate	100kt (185km/h)	130kt (240km/h)	160kt (295km/h)	185kt (345km/h)	230kt (425km/h)
	Final	110kt (205km/h)	150kt (280km/h)	240kt (445km/h)	265kt (490km/h)	275kt (510km/h)

** Maximum speed for reversal and racetrack procedures.*
Vat - Speed at threshold base on 1.3 time stall speed Vso or 1.23 time stall speed Vs1g in the landing confoguration maxximum certificated landing mass.

RVR (RUNWAY VISUAL RANGE)

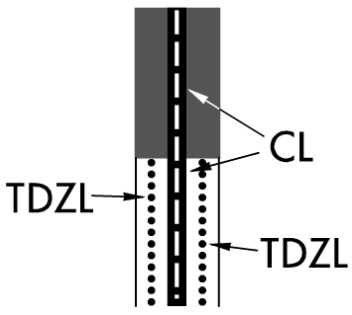
RVR (Metres)	RVR (Feet)	Visibility (Miles)	Comparable Values of RVR and Visibility
400	1600	¼	The following table shall be used for converting RVR to ground or flight visibility. For converting RVR values that fall between listed, use the next higher RVR value: do not interpolate. For example, when converting 1800 RVR, use 2400 RVR with the resultant visibility of 1/2 mile.
800	2400	1/2	
1000	3200	5/8	
1200	4000	3/4	
1400	4500	7/8	
1600	5000	1	
2000	6000	1 1/4	

APPROACH LIGHTING SYSTEM

	**HIAL CAT-1**	High Intensity Approach Lighting Category-1
	**HIAL CAT-2**	High Intensity Approach Lighting Category -2
	**SHIAL**	Simple High Intensity Approach Lighting
	**LIAL**	Low Intensity Approach Lighting

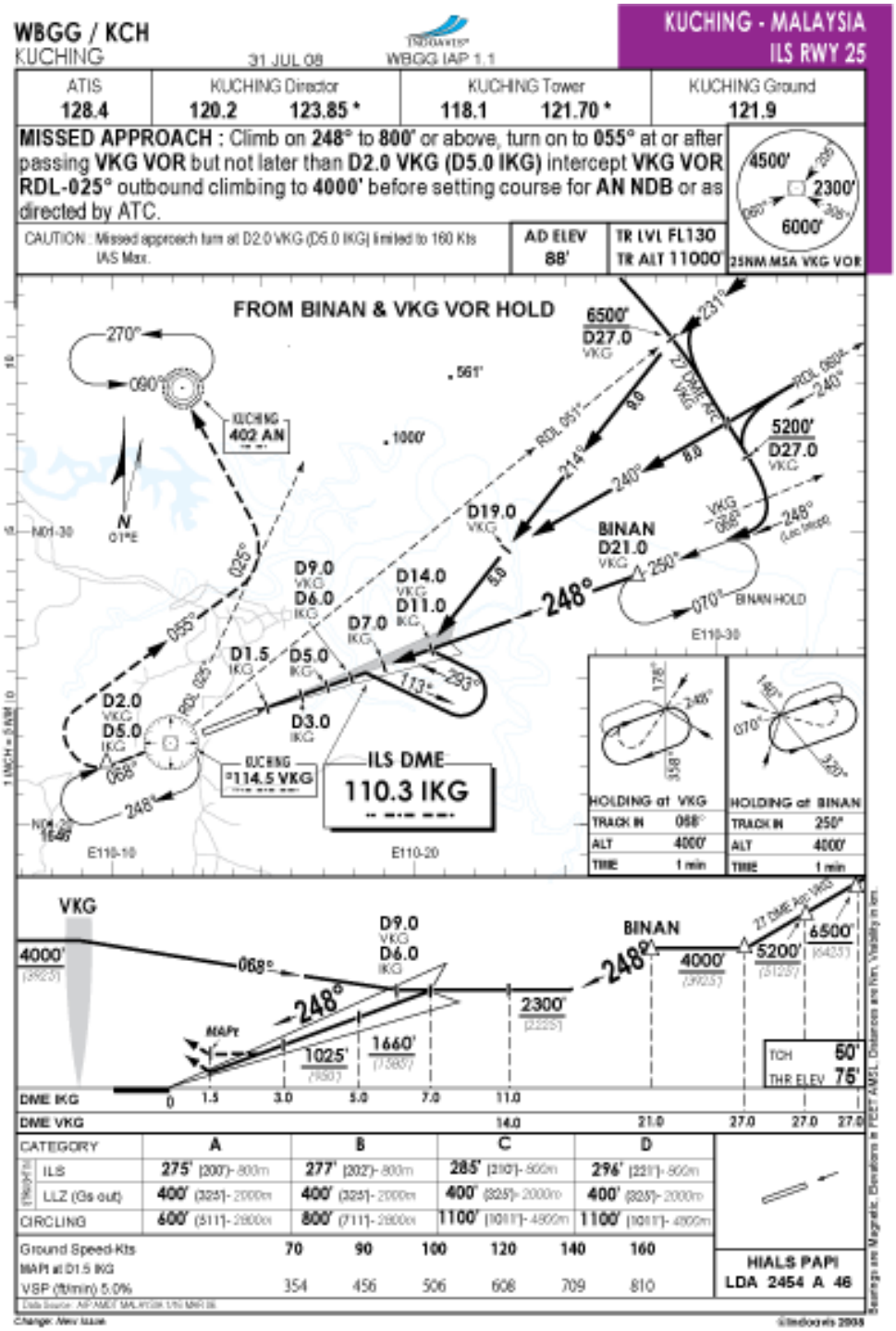
For a 3.00° glideslope the nominal eye height over the runway threshold is 49' (15m) Fan increase in eye height over the runway threshold is required to provide adequate wheel clearance, then the approach nay be flown with one more fly down lights visible.

	**PAPI**	Precision Approach Path Indicator	PAPI is normally installed on the LEFT side of the runway
	**T-VASI**	Visual Approach Slope Indicator	VASI is normally installed on the LEFT side of the runway. VASI may be installed on the RIGHT side or BOTH sides of the runway

	**TDZL**	Runway touchdown Zone
	CL	Runway centerline light

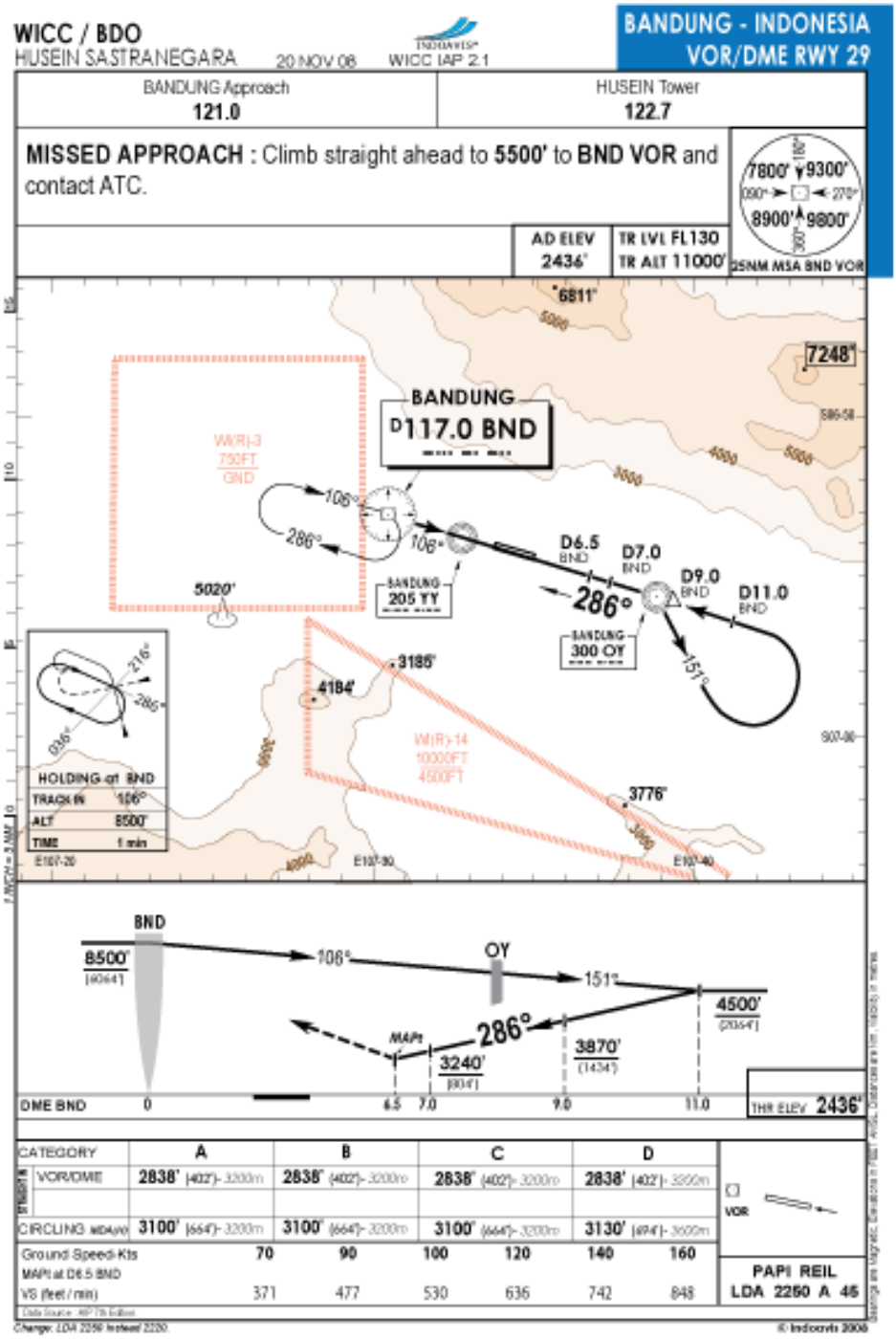
INSTRUMENT APPROACH CHART
ILS RWY-25 PROCEDURE
WBGG- KUCHING, MALAYSIA

SAMPLE ONLY NOT FOR NAVIGATION USE.!



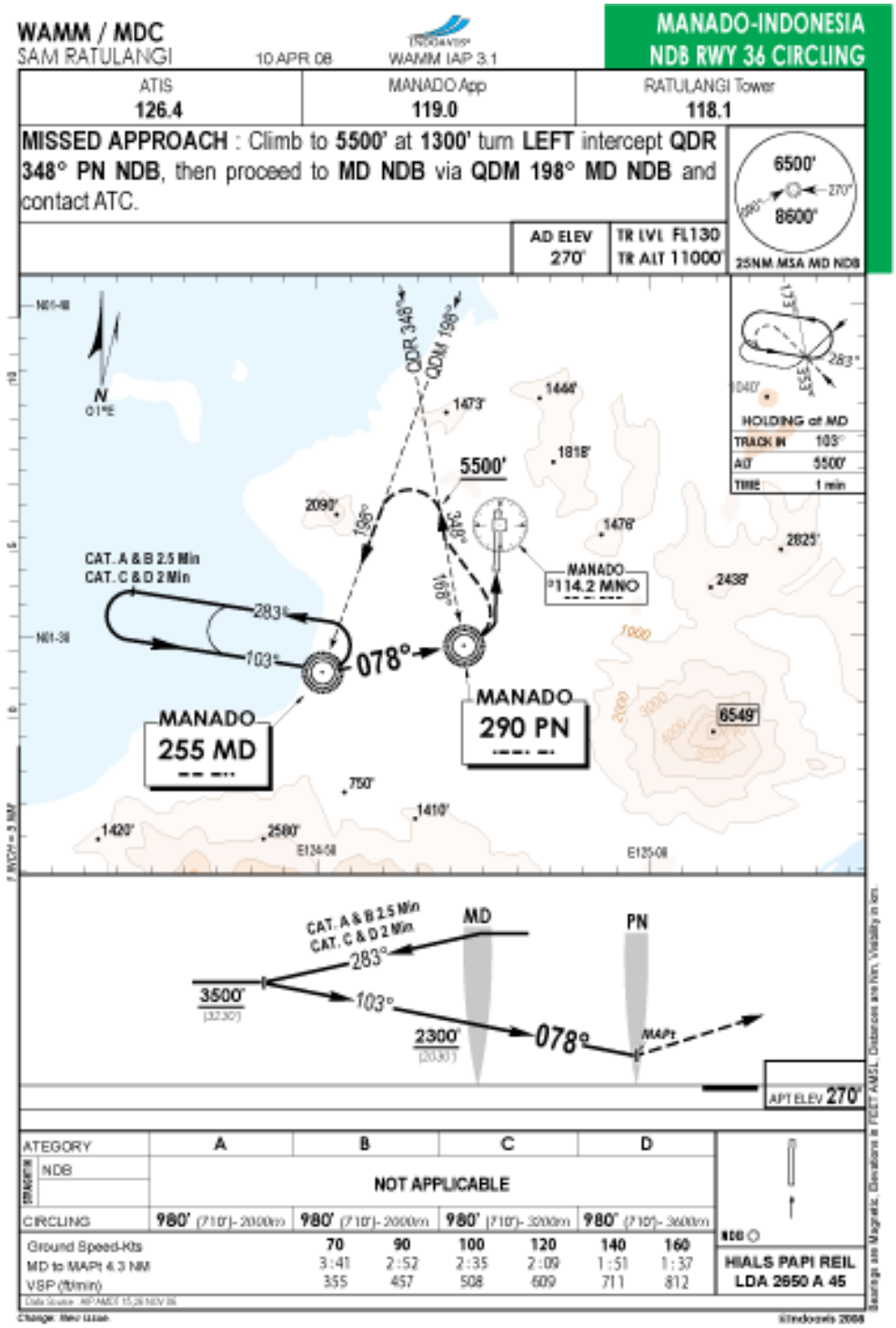
INSTRUMENT APPROACH CHART
VOR/DME RWY-29 PROCEDURE
WICC - BANDUNG, INDONESIA

SAMPLE ONLY NOT FOR NAVIGATION USE.!



INSTRUMENT APPROACH CHART
NDB RWY-36 PROCEDURE
WAMM- MANADO, INDONESIA

SAMPLE ONLY NOT FOR NAVIGATION USE.!



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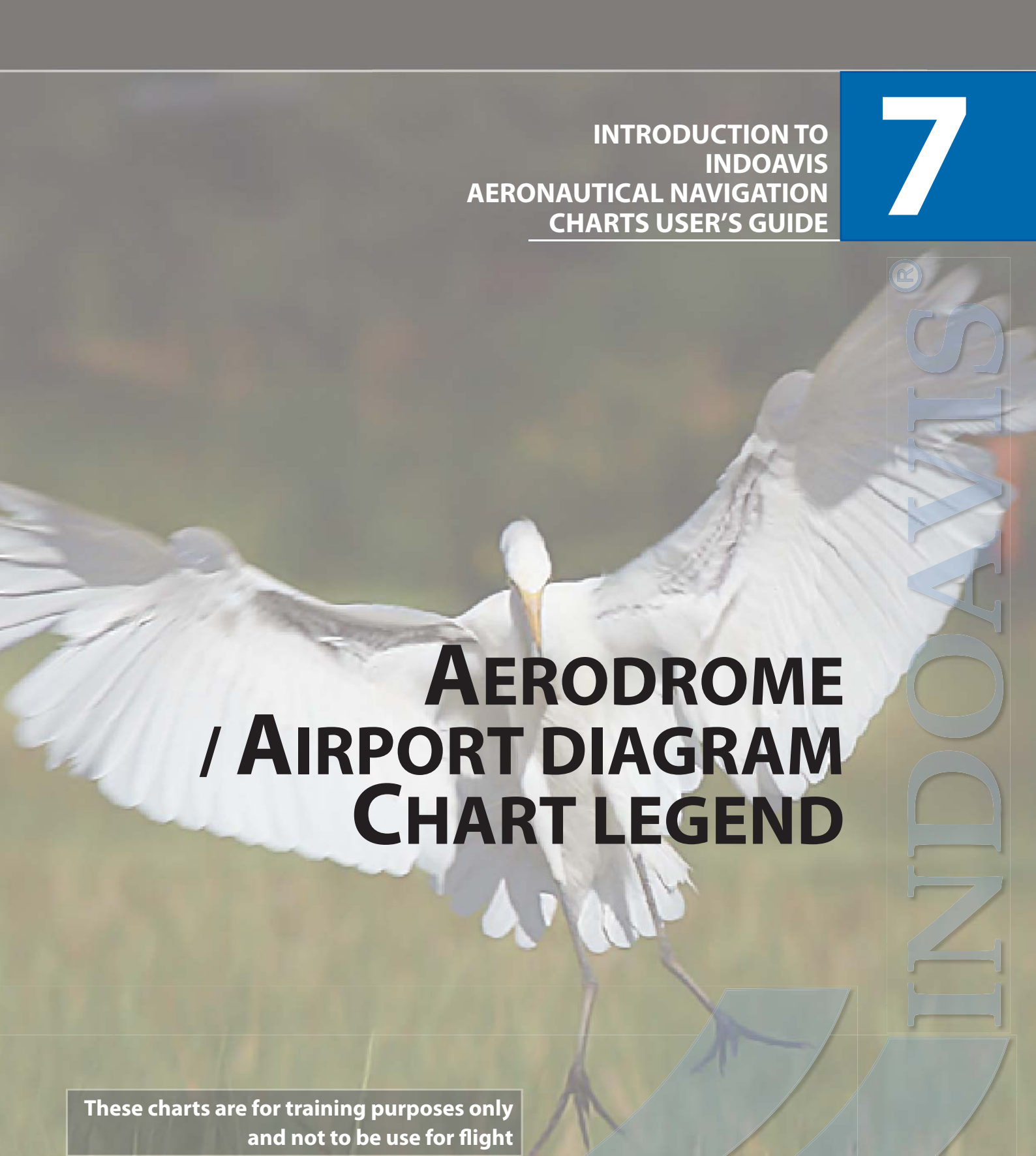

AERODROME / AIRPORT DIAGRAM CHART LEGEND

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

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DOC NO: INDOAVIS.UG.0I/III/2009

INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

English Version

AERODROME CHART LEGEND

AERODROME CHARTS LEGEND

GENERAL

The aerodrome chart is typically printed on the reverse side of the first approach chart in the series. At many airports, especially large terminals, the airport chart will precede the first approach chart and contain an enlarged diagram.

Aerodrome charts depict communications frequencies as well as runway, taxiway and ramp information. Additionally, approach and runway lighting, declared distances, IFR and obstacle departure procedures, and take-off and alternate minimums are shown.

In the example of a chart with an enlarged diagram, this information will usually be printed on the reverse side of the airport diagram. Separate charts may be included that depict detailed ramp areas and parking positions as well as low visibility taxi routes.

CORRECTIONS, COMMENTS

FOR CHART ERRORS,
OR FOR CHANGES, ADDITIONS
RECOMMENDATIONS ON PROCEDURAL ASPECTS PLEASE CONTACT:

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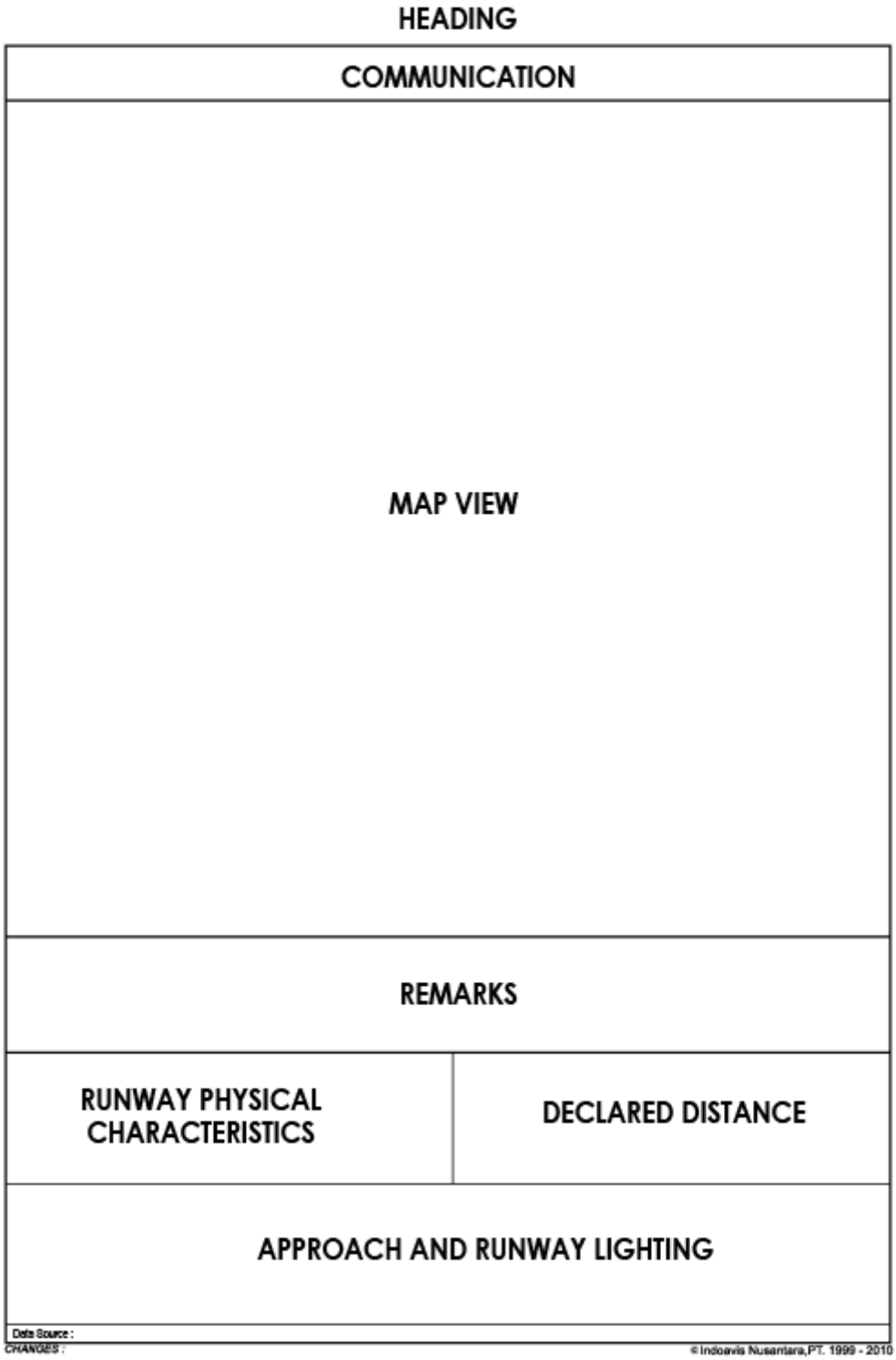
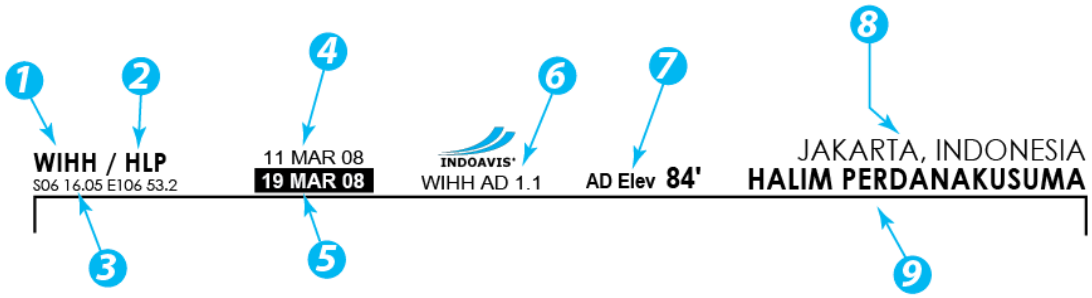
Frequently asked questions (FAQ) are answered on our website at :
http://www.indoavis.co.id
http://www.indoavis.net
email : info@indoavis.co.id
hal.londy@gmail.com
See the FAQs prior to contact number or email.

GENERAL CHART FORMAT

The seven step of Indoavis Aerodrome chart layout



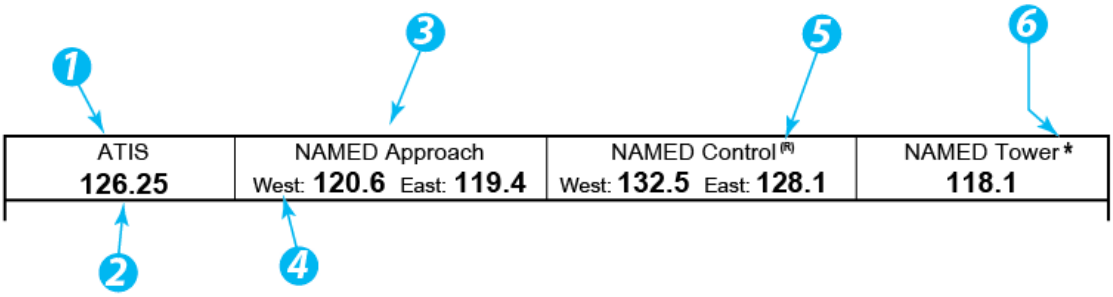
H E A D I N G



OVERVIEW OF HEADING FEATURES

1. ICAO Code Location identifier
2. IATA Code Location identifier
3. Geographic latitude and longitude coordinates represent the location of the ARP
4. Revision dates by (AIRAC DATE)
5. Effective dates
6. Index and code number chart
7. Airport elevation in Feet
8. Geographic Location City, Country
9. Airport Name

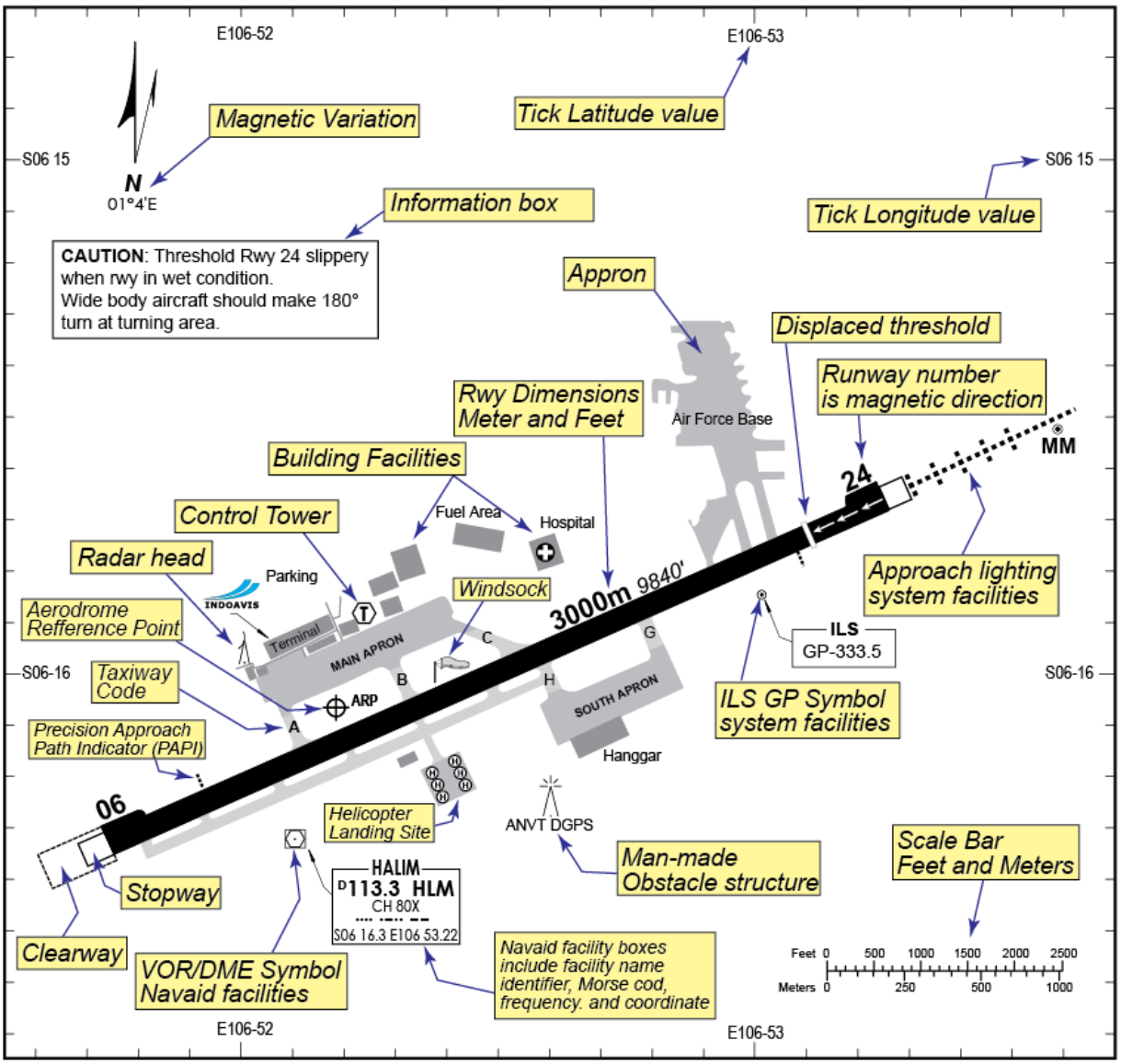
COMMUNICATION



OVERVIEW OF COMMUNICATION FEATURES

1. ATIS Facilities (Automatic Terminal Information Services)
2. Frequencies
3. Facilities Name
4. Location facilities
5. Radar (R) is available
6. An asterisk (*) indicated part-time operation

MAP VIEW
Briefing Sequence



AERODROME CHART LEGEND
MAP VIEW SYMBOLS

1. SYMBOLS

2500m 8200′	Runway length (meters and feet)
09	Runway number in magnetic direction Rounded to close (093 -> 09)
09w	Seaplane operating area or water runway
	Paved runway
	Unpaved runway
	Displaced threshold
X	Runway close
	Stop-way or overrun
	Clearway
	Runway strip
	Designated stop bar or designated holding position.
	Area under construction

2. RADIO NAVIGATION AIDS

	LOC/LDA/ SDF/MLS	Transmitter (Shown when installation is offset from its normal position off the end of the runway)
	LOC/DME	Collocated LOC and DME radio navigation aids
	VOR	VHF omnidirectional radio range
	NDB	Non-directional radio beacon
	TACAN	Tactical air navigation aid
	DME	Distance measuring equipment
	VOR/DME	Collocated VOR and DME radio navigation aids
	VORTAC	Collocated VOR and TACAN radio navigation aids
	Compass rose	• Compass rose To be orientated on the chart in accordance with the alignment of the station (normally Magnetic North), • Compass rose to be used as appropriate in combination with the following symbols: (VOR, VOR/DME, TACAN, VORTAC)

3. RADIO NAVIGATION AIDS INFORMATION

NDB (Secondary)	BATAM 370 BM	Navaid facility boxes include facility name, identifier, Morse code, frequency and geographic coordinate. In VOR/DME and VORTAC facility boxes the letter "D" Indicate DME.
VOR, (Primary)	BATAM 116.0 BTM N01 08.2 E104 07.95	
VOR/DME	BATAM D116.0 BTM N01 08.2 E104 07.95	
ILS, LOC, LDA, SDF, MLS (primary)	ILS LLZ 110.10 IBTM	

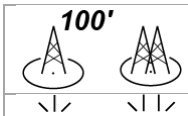
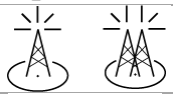
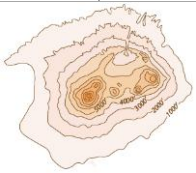
4. REFERENCE FEATURES

ARP	ARP	Aerodrome Reference Point
ARP	ARP	Aerodrome Reference Point located on runway centerline
T	CT	Control Tower
H	Heliport	Helicopter Landing site A white letter H indicates an area reserved for take-off and landing of helicopters.
H	Helideck	
	Windsock	Windsock
	UNLIT	Wind Direction
	LIT	
A B C Apron Terminal Bld.		- Taxiway with code - Apron - Terminal Building

5. CULTUR FEATURES

	Building / Terminal
	Bluff
	Trees
	Road
	Railroad
	Transmission lines
	Oil Tanks
	Lighted pole
	River

6. OBSTACLE

	Tower Unlighted	Man-made structure.
	Tower Lighted	Man-made structure.
	Obstacle Structure	Unidentified man-made structure
	Spot Elevation	Mean Sea Level (MSL) elevation at top of terrain high point/man-made structure.
	Spot Elevation	unsurveyed accuracy
		Generalized terrain contour information. The Gradient tints indicate the elevation change between contour intervals

7. MAGNETIC BEARING AND SCALE

	Bearing magnetic variation Magnetic declination is the angle between magnetic north (the direction the north end of a compass needle points) and true north. The declination is positive when the magnetic north is east of true north. The term magnetic variation is a synonym
Scale Bar	

ADDITIONAL RUNWAY INFORMATION

RWY	1 RUNWAY PHYSICAL CHARACTERISTICS					2 DECLARED DISTANCE						
	Dimensions of RWY	STRENGTHS SURFACE	Threshold Coordinates	Threshold Elevation	Slope	Dimension SWY	Dimension CWY	Dimension RWY Strip	TORA	TODA	ASDA	LDA
12 (120°)	2180 x 45m 8135 x 148'	PCN 70 F/C/X/U ASPHALT	S02 34.27 E140 30.51	289'	0.3%	60 x 45m	300 x 90m	2300 x 150m	2180m	2180m	2240m	2180m
30 (302°)			S02 34.87 E140.31.31	289'	0.3%	60 x 45m	-		2180m	2180m	2240m	2180m

3 APPROACH AND RUNWAY LIGHTING									
RWY	APCH LIGHT Type LEN	THR LGT Colour WBAR	VASIS (MEHT) PAPI	TDZ LGT LEN	RWY Center line LGT Length Spacing colour	RWY edge LGT LEN Spacing Colour	RWY End lgt Colour WBAR	SWY LGT LEN (M) colour	Remarks
12 (120°)	NIL	Green	VASIS	NIL	NIL	WHITE	RED	NIL	
30 (302°)	AVBL	Green	VASIS	NIL	NIL	WHITE	RED	NIL	

Data Source : NOTAM, AIP Indonesia 7th edition (2000)

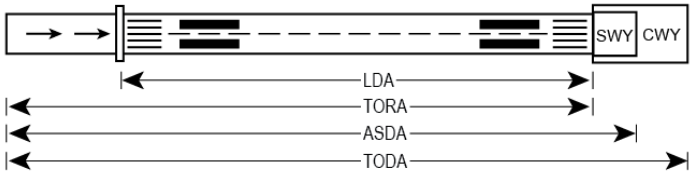
CHANGES : New

1 RUNWAY PHYSICAL CHARACTERISTICS, for each runway, including

a) Runway heading in magnetic
b) Runway Dimension, in meters and feet
c) Strength Surface. PCN (Pavement Classification Number)
   i. 70 - The pavement Classification Number
   ii. F - The type of pavement
   iii. C - The sub grade strength category
   iv. X - The tire pressure category
   v. U - Pavement calculation method
d) THR Coordinate
e) THR Elevation
f) Slope

2 RUNWAY DECLARED DISTANCE, for each runway, including

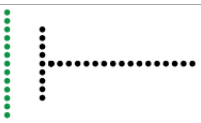
a) SWY : Stop-way
b) CWY : Clearway
c) RWY Strip
d) LDA : Landing distance available
e) TORA : Take-off run available
f) ASDA : Accelerate-stop distance available
g) TODA : Take-off distance available



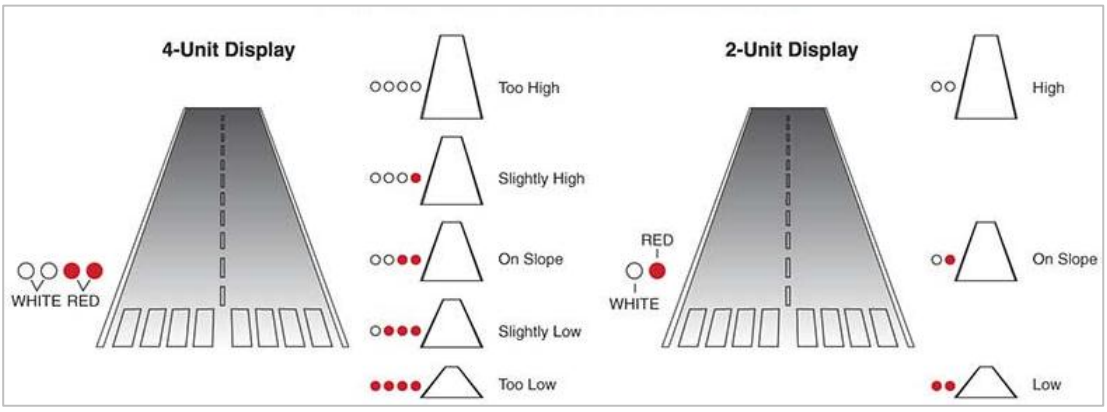
3 APPROACH AND RUNWAY LIGHTING, for each runway, including

a) Runway heading in magnetic
b) Runway dimension
c) Type, length and intensity of approach lighting System
d) Runway threshold lights, color and wing bars
e) Type of visual approach slope indicator system
f) Length of runway touchdown zone lights
g) Length, spacing, color and intensity of runway center line lights
h) Length, spacing, color and intensity of runway edge lights
i) Color of runway end lights and wing bars
j) Length and color of stop-way lights
k) Remarks

APPROACH AND RUNWAY LIGHTING SYMBOLS

	HIAL CAT1	High Intensity Approach Lighting Category 1
	HIAL CAT2	High Intensity Approach Lighting Category 2
	Simple HIAL	High Intensity Approach Lighting Simple
	Low IAL	Low Intensity Approach Lighting
	T-VASIS (T-VASI)	Tee Visual Approach Slope Indicator. (left and right side of runway)
	AT-VASIS	Abbreviated Tee Visual Approach Slope Indicator (L or R indicates left or right side of runway only).
	PAPI	Precision Approach Path Indicator (L or R indicator left or right side of runway only)
	PLASI	Pulsating Visual Approach Slope Indicator, normally a single light unit projecting two colors. (L or R indicates left or right side of runway only).

PRECISION APPROACH PATH INDICATOR



PAPI : From the Pilot's View

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8

STANDARD INSTRUMENT DEPARTURE (SID) AND ARRIVAL (STAR) CHARTS LEGEND

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DOC NO: INDOAVIS.UG.0I/III/2009

INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

English Version

STANDARD INSTRUMENT DEPARTURE (SID) AND ARRIVAL (STAR) CHART LEGEND

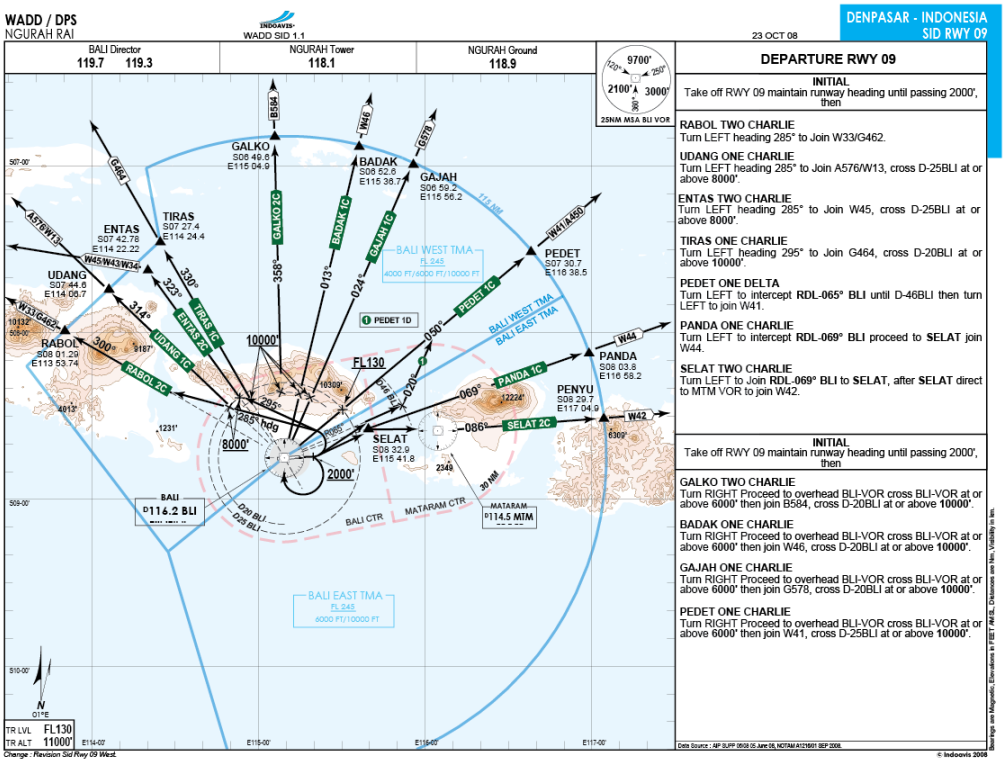
SID / STAR CHART LEGEND

GENERAL

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

FUNCTION

- **STANDARD INSTRUMENT DEPARTURE (SID)** Charts. This chart shall provide the flight crew with information to enable it to comply with the designated standard departure route instrument from take-off phase to the en-route phase.
    - *Note 1.- Provisions governing the identification of standard departure routes are in Annex 11, Appendix 3 guidance material relating to the establishment of such routes is contained in the Air Traffic Services Planning Manual (Doc 9426).*
    - *Note 2.- Provisions governing obstacle clearance criteria and details of the minimum information to be published are contained in the Procedures for Air Navigation Services - Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part II.*



- **STANDARD TERMINAL ARRIVAL (STAR)** Charts. This chart shall provide the flight crew with information to enable it to comply with the designated standard arrival route — instrument from the en-route phase to the approach phase.
    - *Note 1 - Standard arrival routes — instrument are to be interpreted as including "standard descent profiles"," continuous descent approach", and other non-standard descriptions. In the case of a standard descent profile, the depiction of a cross-section is not required.*
    - *Note 2 - Provisions governing the identification of standard arrival routes are in Annex 11, Appendix 3; guidance material relating to the establishment of such routes Is contained in the Air Traffic Services Planning Manual (Doc 9426).*

Coverage and scale
The coverage of the chart shall be sufficient to indicate the point where the departure route begins and the specified significant point at which the en-route phase of flight along a designated air traffic services route can be commenced.
Note.- The departure route normally originates at the end of a runway.

Identification
The chart shall be identified by the name of the city or town, or area, which the aerodrome serves, the name of the aerodrome and the identification of the standard departure route(s) — instrument as established in accordance with the *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS, Doc 8168), Volume II, Part II, Chapter 5.

- *Note.— The identification of the standard departure route(s) — instrument is provided by the procedures specialist.*

Recommendation
To improve situational awareness in areas where significant relief exists, the chart should be drawn to scale and all relief exceeding 300 m (1000 ft) above the aerodrome elevation should be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, should be shown printed in black. Obstacles should also be shown.

- *Note 1.— The next higher suitable contour line appearing on base topographic maps exceeding 300 m (1000 ft) above the aerodrome elevation may be selected to start layer tinting.*
- *Note 2.— An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in Appendix 3 — Colour Guide for contours and topographic features*.
- *Note 3.— Appropriate spot elevations and obstacles are those provided by the procedures specialist.*

CORRECTIONS, COMMENTS

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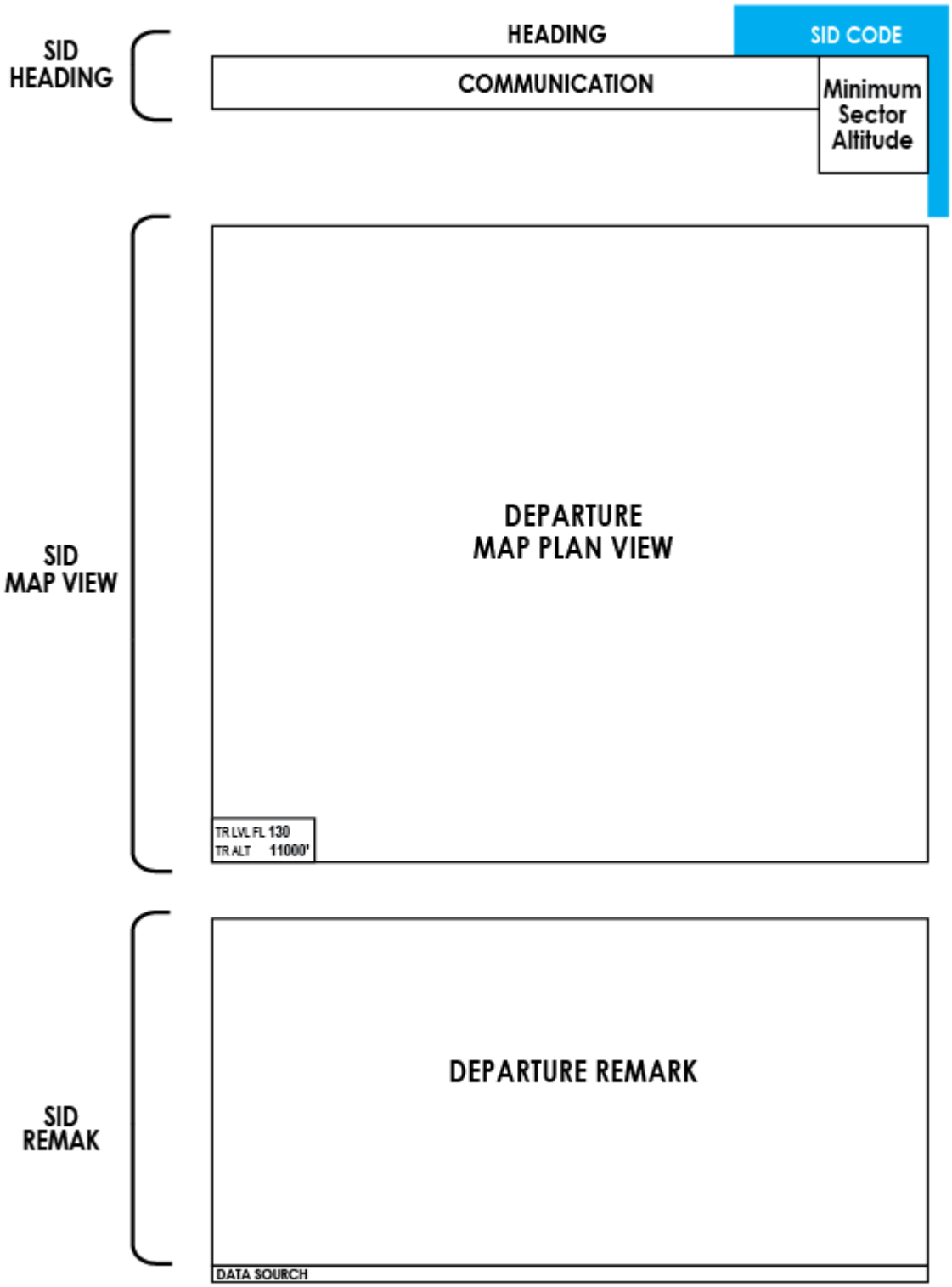
http://www.indoavis.net
email : info@indoavis.co.id
hal.londy@gmail.com

See the FAQs prior to contact number or email.

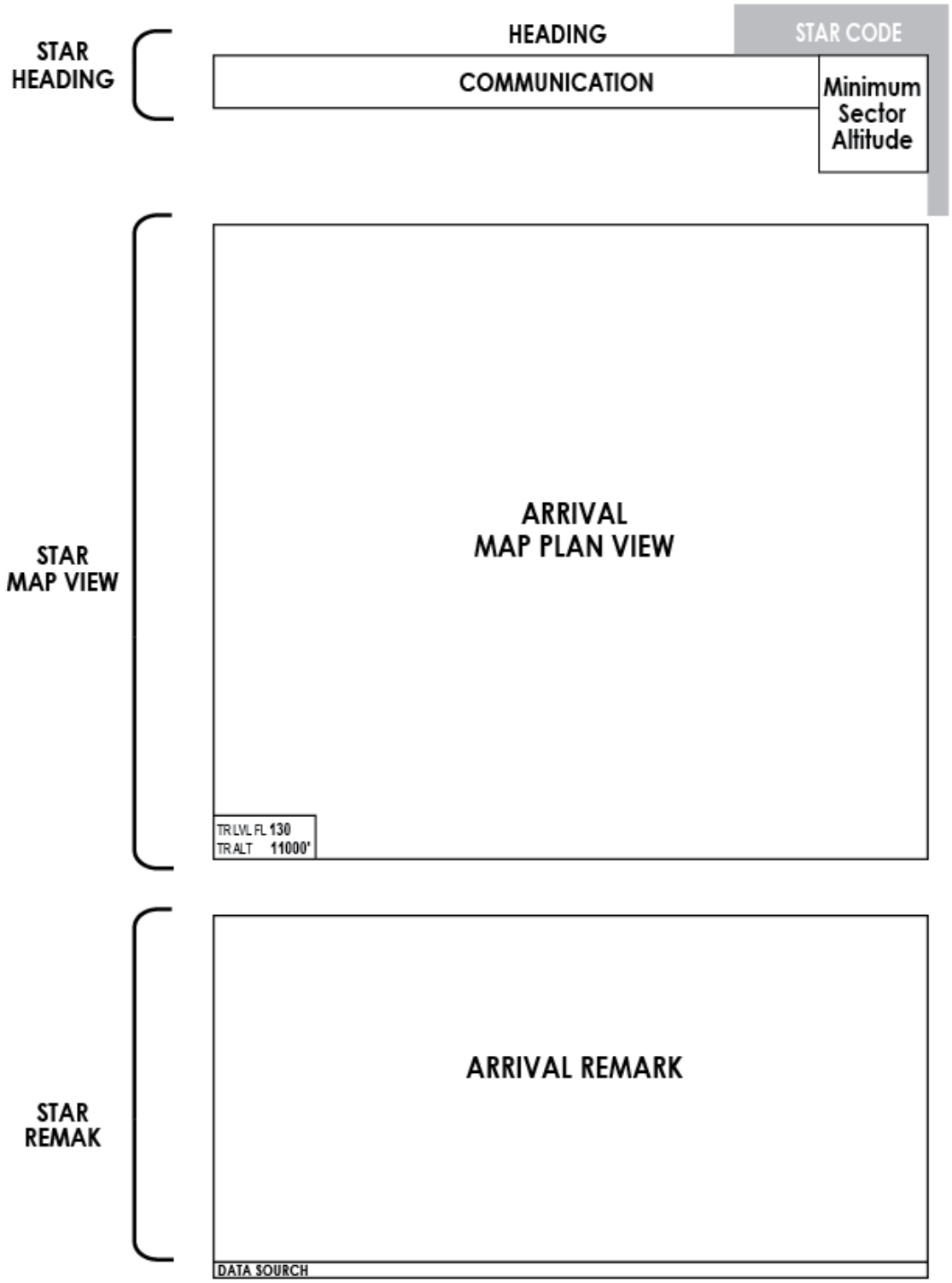
GENERAL SID CHART FORMAT

The step of Indoavis SID chart layout



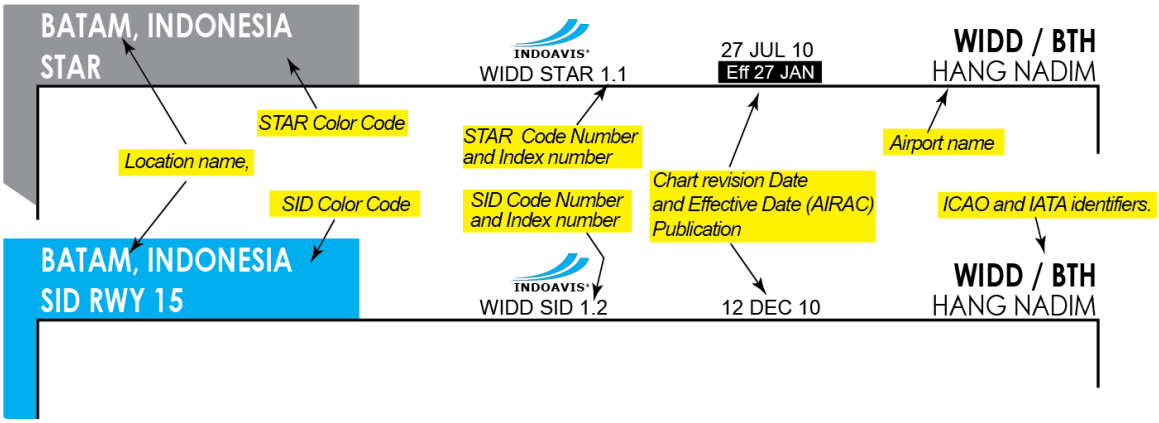
GENERAL STAR CHART FORMAT

The step of Indoavis STAR chart layout

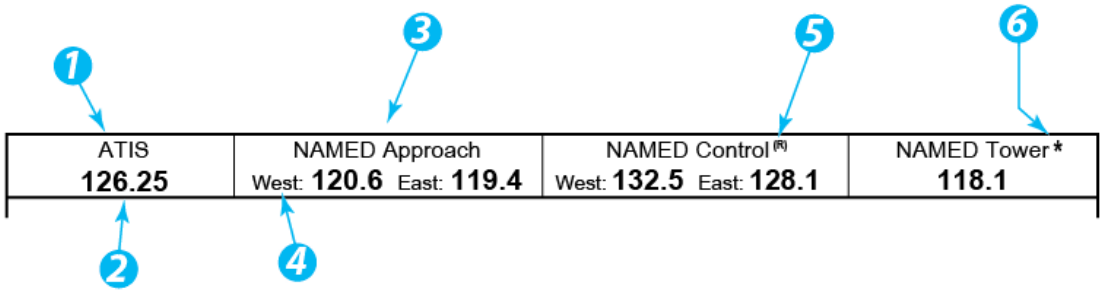


H E A D I N G

OVERVIEW OF HEADING FEATURES



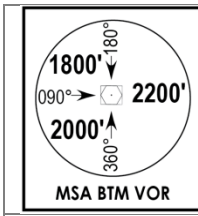
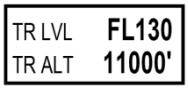
COMMUNICATION



OVERVIEW OF COMMUNICATION FEATURES

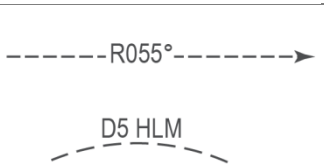
1. ATIS Facilities (Automatic Terminal Information Services)
2. Frequencies
3. Facilities Name
4. Location facilities
5. Radar (R) is available
6. An asterisk (*) indicated part-time operation

SECTOR AND TRANSITION

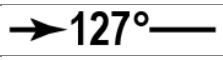
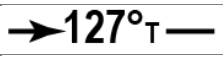
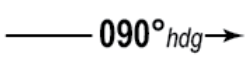
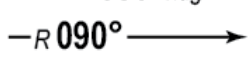
	**MSA (Minimum safe/Sector Altitude)** The MSA is provided when specified by the controling authority. Altitude depicted on (IAP, SID and STAR Chart) and identified as the minimum altitude which provide a 1.000ft obstacle clearance within a 25 NM radius from the navigational facility upon which the MSA is pirated. If the radius limit is other than 25NM.
	**Transition Level (TR LVL) and Transition Altitude (TR ALT)** are listed below the map view. The transition level (QNE) is the lowest level of flight using standard altimeter setting (29.92 inches of mercury or 760 millimeters of mercury or 1013.2 ,illibars or 1013.2 hectopascals.) The transition altitude (QNH) is the altitude at and below which local pressure setting must be used.

SID/STAR CHART LEGEND
MAP VIEW SYMBOLS

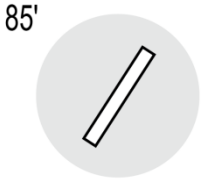
1. PROCEDURE TRACKS

	Departure/Arrival procedure track
	Missed approach procedure track
	Radial line and value BR - (Bearing) R - (Radial) LR- (Lide Radial) hdg - (Heading) D - Distance
	Track Transition Name Minimum En-route Altitude (MEA) Segment mileage
	Airways Designator Flight level
	Scale break

2. BEARING TRACKS

	Magnetic course
	True course
	Magnetic heading
	Magnetic radial

3. AIRPORT SYMBOLS

	Primary SID/STAR Airport Airport Name and Elevation (MSL)
	Secondary SID/STAR of Civil Airport
	Secondary SID/STAR of Military Airport
	Secondary SID/STAR of Join civil and Military Airport

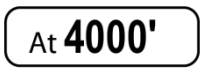
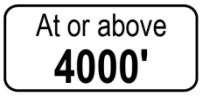
4. RADIO NAVIGATION AIDS SYMBOLS

	LOC/LDA/ SDF/MLS	Transmitter (Shown when installation is offset from its normal position off the end of the runway)
	LOC/DME	Collocated LOC and DME radio navigation aids
	VOR	VHF omnidirectional radio range
	NDB	Non-directional radio beacon
	TACAN	Tactical air navigation aid
	DME	Distance measuring equipment
	VOR/DME	Collocated VOR and DME radio navigation aids
	VORTAC	Collocated VOR and TACAN radio navigation aids
		Compass rose • Compass rose To be orientated on the chart in accordance with the alignment of the station (normally Magnetic North), • Compass rose to be used as appropriate in combination with the following symbols: (VOR, VOR/DME, TACAN, VORTAC)

5. RADIO NAVIGATION AIDS INFORMATION

ILS, LOC, LDA, SDF, MLS (primary)		Navaid facility boxes include facility name, identifier, Morse code and frequency. The shadow indicates the primary facility. In VOR/DME and VORTAC facility boxes the letter “D” Indicate DME and “H” High Altitude when available.
VOR, VOR/DME (Primary)		
NDB (Secondary)		

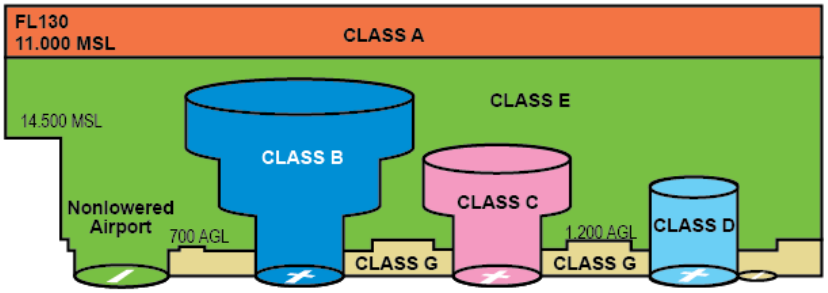
6. ALTITUDE

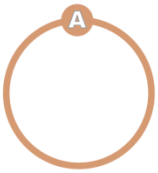
		MANDATORY	Mandatory altitude in line cross at.
		MINIMUM	Minimum altitude in line cross at or above
		MAXIMUM	Maximum altitude in line cross at or below
4000'		RECOMMENDED	Recomended altitude

7. AIRSPACE CLASSIFICATIONS

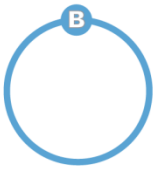
Airspace classification is designated by the letters **(A)** thru **(G).** Classification **(A)** represents the highest level of control and **(G)** represents uncontrolled airspace. The definition of each classification is found in the Glossary portion of this section and the En-route and Air Traffic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

INDONESIAN AIRSPACE CLASSES

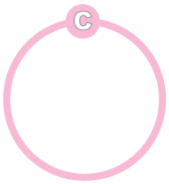




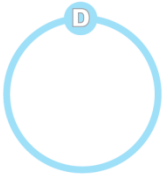
CLASS A Airspace; Class A Airspace is the airspace from FL110 (11,000) feet to FL130 (13,000). All pilots flying in Class A airspace shall file an Instrument Flight Rules (IFR) flight plan and receive an appropriate air traffic control (ATC) clearance. When climbing through 11,000 feet, the pilot will change the altimeter setting from the local altimeter (30.01 for example) to 29.92. This ensures all aircraft flying in class A airspace have the same altimeter setting and will have proper altitude separation.



CLASS B Airspace; Class B Airspace is generally the airspace from the surface to 10,000 feet. This airspace is normally around the busiest airports in terms of aircraft traffic. Class B airspace is individually designed to meet the needs of the particular airport and consists of a surface area and two more layers. Most Class B airspace resemble an upside down wedding cake. Pilots must contact air traffic control to receive an air traffic control clearance to enter Class B airspace. Once a pilot receives an air traffic control clearance, they receive separation services from other aircraft within the airspace.



CLASS C Airspace; Class C Airspace is the airspace from the surface to 4,000 feet above the airport elevation. Class C airspace will only be found at airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations. Although Class C airspace is individually tailored to meet the needs of the airport, the airspace usually consists of a surface area with a 5 nautical mile (NM) radius, an outer circle with a 10 NM radius that extends from 1,200 feet to 4,000 feet above the airport elevation and an outer area. Pilots must establish and maintain two-way radio communications with the ATC facility providing air traffic control services prior to entering airspace. Pilots of visual flight rules (VFR) aircraft are separated from pilots of instrument flight rules (IFR) aircraft only. Anchorage International airport.



CLASS D Airspace; Definition. Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures.

8. RESTRICTED AIRSPACE

	Restricted airspace. The accompanying label indicates it as prohibited, restricted, danger, etc. (T) Training, (A) Alert, (C) Caution, and Military Operations Areas.

WI-(R)-121 UNL GND (0800 - 2200 LT MON - SAT IND-ARTC)	**WI** Country identifier WI : Indonesia, WS : Singapore WM : Malaysia YB : Australia **(R)** Restricted _____→ **121** designation number **UNL** Unlimited (Upper Limit) **GND** Ground (Lower Limit) **0800-2200** Hours active **MON-SAT** Day active **IND-ARTC** Controling Agency	(A) Alert (T) Training (C) Caution (W) Warning (D) Danger (P) Prohibited (R) Restricted (TRA) Temporary Reserved Airspace (TSA) Temporary Segregated Area (MOA) Military Operations Area

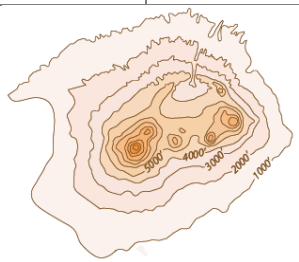
9. AIRSPACE FIXES

	RPC	Reporting Point (Compulsory)
	RPR	Reporting Point (On-Request)
	RNAV	RNAV Point (Compulsory)
	RNAV	RNAV Point (On-Request)
	DME	DME Distance
	MB	Mileage Breakdown
	WPT	Flyover Waypoint
	WPT	Fly-by Waypoint
D3.0 IHAL	DME info	DME value Navaid name
SPADA S05 40.7 E107 54.6	FIX POINT Info	Fixes Point Name Coordinates are shown

10. MAGNETIC BEARING

	**Bearing magnetic variation** **Magnetic declination** is the angle between magnetic north (the direction the north end of a compass needle points) and true north. The declination is positive when the magnetic north is east of true north. The term **magnetic variation** is a synonym

11. TERRAIN HIGH POINT (OBSTACLE)

45	Spot Elevation	Mean Sea Level (MSL) elevation at top of terrain high point/man-made structure.
45±	Spot Elevation	unsurveyed accuracy
1065	Spot highest elevation	Box indicates only the highest of portrayed terrain high point and man-made structures may exist which have not been portrayed.
		Generalized terrain contour information. The Gradient tints indicate the elevation change between contour intervals

INTRODUCTION TO
INDOAVIS
AERONAUTICAL NAVIGATION
CHARTS USER'S GUIDE

9

MISCELLANEOUS

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

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DOC NO: INDOAVIS.UG.0I/III/2009

INTRODUCTION TO INDOAVIS AERONAUTICAL CHART USER'S GUIDE

English Version

MISCELLANEOUS

MISCELLANEOUS

INTRODUCTION

In the design of a map or a product, Indoavis has been providing calculate software that is needed in the manufacture of a product. Calculate itself is interpreted as a count to make a deliberate purpose, or design*. Or a calculation is a deliberate process that transforms one or more inputs into one or more results, with variable change. [sample: count Latitude and Longitude, calculate the True Air Speed, altitude MORA count or calculate Obstacle in an airport.

Indoavis widely Calculate recording needs within the IEDs. IEDs are Indoavis Electronic Data System is an electronic data center that contains a variety of information especially data Aeronautics and topography. The Calculate function consists of http://www.indoavis.net or http://www.indoavis.co.id

INDOAVIS ELECTRONICS CALCULATION

1. Angle - Angle conversions
2. Great Circle – Latitude and Longitude Calculations
3. Straight-in Descent - PAN-OPs calculations
4. HGT to MORA – Shuttle Radar Topography Mission to MEF Calculations
5. TAS - True Air-Speed calculations
6. Obstacle - AD Obstacle check

UNITS MEASURE

The Indoavis Standards and Recommended Practices

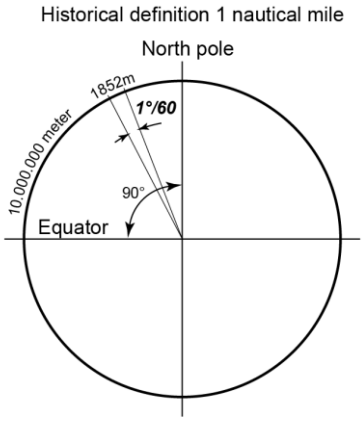
DISTANCE

- Distance in nautical miles (except visibility in meters)
- Runway Dimension in meters
- Elevation in feet, Mean Sea Level (MSL)
- Ceilings in feet above elevation
- Radials / bearing / heading / courses are magnetic.
- Horizontal Datum : Unless otherwise noted on the chart, all coordinates are referenced to Indonesia UTM (Universal Transverse Mercator), which for charting purposes is considered equivalent to World Geodetic System 1984 (WGS 84)

Unit	Symbol	Definition (in terms of SI units)	
1 centimeter	Cm	0.3937in	0.032808 ft.
1 foot	ft	0.3048 m	12 in
1 inch	in	25.40 mm	2.540 cm
1 kilometer	Km	3280.8 ft	0.540 nm.
1 meter	m	39.37 in	3.280840 ft
1 nautical mile	Nm	6,080 ft	1.852 km.
1 statute mile	Sm	5,280 ft	1.6093 km 0.8684 nm.

** Distance vertical (altitude, elevation, height, vertical speed.)*

NAUTICAL MILES



Nautical Miles is a unit of length corresponding approximately to one minute of arc of latitude along any meridian. The nautical mile remains in use by sea and air navigators worldwide because of its convenience when working with charts.

- **1° = 60Nm**
- **1 Nm = 1.852 Km**

Accuracy versus decimal places at the equator

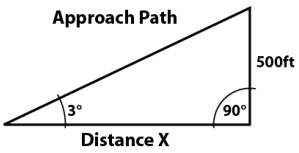
- **1° = 111Km**

TANGENT OF THREE (3°) Degrees

Show a practical application of Trigonometry in the aviation environment.
Background: When approaching an airport, pilots must learn to maneuver their aircraft visually, so that a stabilized approach to the runway can be flown at a constant approach angle.

- Precise approach planning insures a smooth transition to a landing within the Touchdown Zone of the runway.
- Pilots must sometimes execute visual approaches that are varied in size, shape, and angle based upon a variety of factors such as: other aircraft, obstructions, noise abatement, or prevailing weather conditions. The standard approach angle however, is 3°. This 3° angle is the standard approach angle integrated into Instrument Landing Systems (ILS)
- Visual Approach Slope Indicators (VASI)
- installed at many airports. When flying a normal traffic pattern, the aircraft is maneuvered so that the final approach in intercepted at an altitude of 500 feet above the elevation of the airport (AFE).

In order to fly the standard 3° approach, how long should the final approach segment be if the pilot plans to turn final at 500 feet AFE?

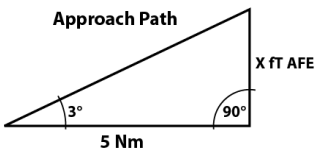


500 feet/tan3 = 9,540.56683
6076.1 feet = 1 Nm
9,540.5683 feet /6076.1 = 1.57nm

If we begin our final approach 500 feet AFE, we can compute the length of our final approach (Distance X) by dividing our altitude (500 feet AFE) by the tangent of 3°So, 500 feet/tan 3 = 9,541feet.

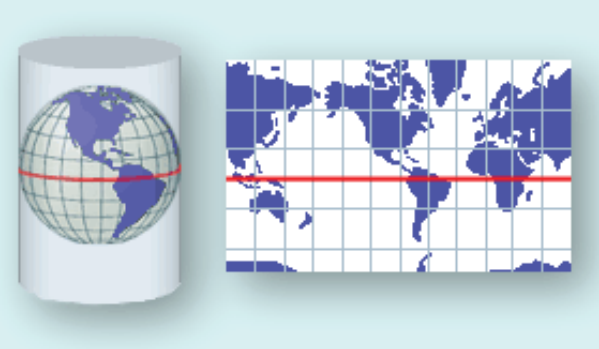
A Conversion for Convention:
Pilots are accustomed to judging distance in miles, more precisely Nautical Miles (nm).
To convert 9,540.5683 feet to nautical miles, we use the factor 6076.1 feet per nm.
9,540.5683 feet /6076.1 = 1.57nm, or a final approach segment approximately 1.6nm in length.

If the pilot planned the approach to begin 5nm (a typical distance for an ILS) from the end of the runway, at what altitude (AFE) should the aircraft be when intercepting the final approach?



1nm = 6,076.1 feet
5nm = 6076.1 x 5 = 30,380.5 feet
30,380.5 x 3 tan = 1,592 feet AFE

MERCATOR PROJECTION



DESCRIPTION: Originally created to display accurate compass bearings for sea travel. An additional feature of this projection is that all local shapes are accurate and clearly defined.

PROJECTION METHOD: Cylindrical projection. Meridians are parallel to each other and equally spaced. The lines of latitude are also parallel but become farther apart toward the poles. The poles cannot be shown.

LINES OF CONTACT: The equator or two latitudes symmetrical around the equator.

LINEAR GRATICULES: All meridians and all parallels.

PROPERTIES; Shape conformal Small shapes are well represented because this projection maintains the local angular relationships.

AREA: Increasingly distorted toward the polar regions. For example, in the Mercator projection, although Greenland is only one-eighth the size of South America, Greenland appears to be larger.

Direction: Any straight line drawn on this projection represents an actual compass bearing. These true direction lines are thumb lines and generally do not describe the shortest distance between points.

DISTANCE: Scale is true along the equator or along the secant latitudes.

LIMITATIONS: The poles cannot be represented on the Mercator projection. All meridians can be projected, but the upper and lower limits of latitude are approximately 80° N and S. Large area distortion makes the Mercator projection unsuitable for general geographic world maps.

USES AND APPLICATIONS: Standard sea navigation charts (direction). Other directional uses: air travel, wind direction, ocean currents.
Conformal world maps The best use of this projection's conformal properties applies to regions near the equator such as Indonesia and parts of the Pacific Ocean.

PROJECTION PARAMETERS
ArcInfo: ARC, ARCPLOT, ARCEDIT, ArcToolbox;
PC ARC/INFO; ArcCAD
:PROJECTION MERCATOR
:PARAMETERS
Longitude of central meridian:
Latitude of true scale:
False easting (meters):
False northing (meters):
Projection Engine: ArcMap, ArcCatalog, ArcSDE, MapObjects 2.x, ArcView Projection Utility
Central Meridian - Standard Parallel 1
False Easting -False Northing
ArcView GIS
Central Meridian:
Latitude of True Scale:
False Easting - False Northing

SYMBOLS FOR DEGREES, MINUTES, SECONDS

Symbols	The three common formats	
° (Degrees)	DDD° MM' SS.S"	Degrees, Minutes and Seconds
' (Minutes)	DDD° MM.MMM'	Degrees and Decimal Minutes
" (Seconds)	DDD.DDDDD°	Decimal Degrees

Degrees, Minutes and Seconds

DDD° MM' SS.S"
32° 18' 23.1" N 122° 36' 52.5" W
This is the most common format used to mark maps. It's also the most cumbersome to work with. It's a lot like telling time.

There are sixty seconds in a minute (60" = 1') and there are sixty minutes in a degree (60' = 1°).

Keeping in mind a few easy conversions between seconds and decimal minutes will help when working with maps that use degrees, minutes and seconds.

15 seconds is one quarter of a minute or 0.25 minutes
30 seconds is one half of a minute or 0.5 minutes
45 seconds is three quarters of a minute or 0.75 minutes

Degrees and Decimal Minutes

DDD° MM.MMM'
32° 18.385' N 122° 36.875' W
This is the format most commonly used when working with electronic navigation equipment.

Decimal Degrees

DDD.DDDDD°
32.30642° N 122.61458° W
or +32.30642, -122.61458

This is the format you'll find most computer based mapping systems displaying. The coordinates are stored internally in a floating point data type, and no additional work is required to print them as a floating point number.
Often the N-S and E-W designators are omitted. Positive values of latitude are north of the equator, negative values to the south. Watch the sign on the longitude, most programs use negative values for west longitude, but a few are opposite. This saves a lazy western hemisphere programmer from having to type in a minus sign before most of their longitude values.

Which format should you use?
You can set your GPS to display any one of these three formats. Locations can be entered into the GPS with the selected format, and then by switching the display format setting, viewed in a different format.
to use the Degrees and Decimal Minutes format, even though the INDOAVIS maps using are marked in Degrees, Minutes and Seconds. The markings on the map are all at either 0, 15, 30, or 45 seconds. By remembering the "quarter minute conversions" of 0.00, 0.25, 0.50, and 0.75, I can quickly do the conversions.

Decimal Degrees

Decimal degrees (DD) express latitude and longitude geographic coordinates as decimal fractions and are used in many geographic information systems (GIS), web mapping applications such as Google Maps, and GPS devices. Decimal degrees are an alternative to using degrees, minutes, and seconds (DMS). As with latitude and longitude, the values are bounded by ±90° and ±180° respectively.
Positive latitudes are north of the equator, negative latitudes are south of the equator. Positive longitudes are east of Prime Meridian, negative longitudes are west of the Prime Meridian. Latitude and longitude are usually expressed in that sequence, latitude before longitude.

Accuracy

The radius of the semi-major axis of the Earth at the equator is 6,378,160.0 meters[1] resulting in a circumference of 40,075,161.2 meters. The equator is divided into 360 degrees of longitude, so each degree at the equator represents 111,319.9 meters or approximately 111 km. As one moves away from the equator towards a pole, however, one degree of longitude represents a diminishing number of meters, approaching zero at the pole. The number of decimal places required for a particular accuracy at the equator is:

Accuracy versus decimal places at the equator

Decimal	Degree	Distance
0	1.0	111 Km
1	0.1	11.1 Km
2	0.01	1.11 Km
3	0.001	111 m

A value in decimal degrees to an accuracy of 4 decimal places is accurate to 11.1 meters (± 5.55 m) at the equator. A value in decimal degrees to 5 decimal places is accurate to 1.11 meter at the equator. Because the earth is not flat, the accuracy of the longitude part of the coordinates increases the further from the equator you get. The accuracy of the latitude part does not increase so much, more strictly however, a meridian arc length per 1 second depends on latitude at point concerned. The discrepancy of 1 second meridian arc length between equator and pole is about 0.3 meters because the earth is an oblate spheroid.

The decimal degree representation of the location of the **Halim Perdana Kusuma** Airport

- 6.264966°	106.895084°	Decimal Degree
S07°44'6.13"	E106°53'42.302"	Degrees, Minutes and Seconds
S07°44.102'	E106°53.705'	Degrees and Decimal Minutes

A D, M, S value is converted to decimal degrees using the formula:

$$DD = D + \frac{M}{60} + \frac{S}{3600}$$

DD : Decimal Degree
D : Degree
M : Minute
S : Second

Converting Degrees, Minutes, Seconds to Degrees & Decimals

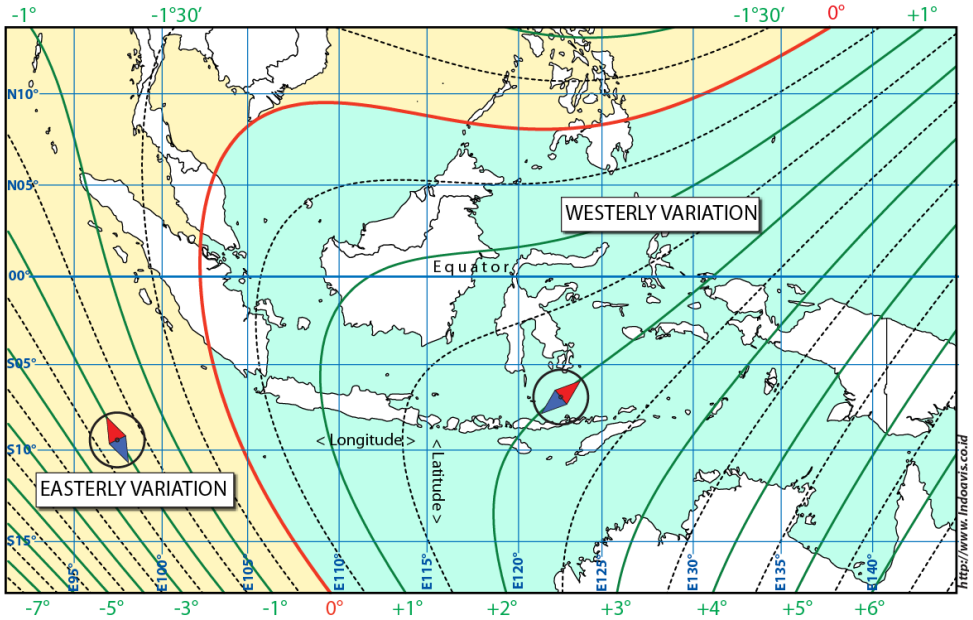
1. **First:** Convert the seconds to a fraction.
   Since there are 60 seconds in each minute, 07° 44' 6.13" can be expressed as
   07° 44 6.13/60. Convert to 07° 44.102'.

2. **Second:** Convert the minutes to a fraction.
   Since there are 60 minutes in each degree, 07° 44.102' can be expressed as
   07 44.102/60. Convert to 06.264966°.

ISOGONIC LINES

Isogonic lines, an imaginary line connecting points on the Earth's surface where the magnetic declination is the same.

Indonesia Isogonic lines - Lines drawn across aeronautical charts to connect points having the same magnetic declination. Anywhere along this line the two poles are aligned, and there is no variation. East of this line, the magnetic pole is to the west of the geographic pole and a correction must be applied to a compass indication to get a true direction.



Magnetic declination has a very important influence on air navigation, since the most simple aircraft navigation instruments are designed to determine headings by locating magnetic north through the use of a compass or similar magnetic device.

Aviation sectionals (maps / charts) and databases used for air navigation are based on True north rather than magnetic north, and the constant and significant slight changes in the actual location of magnetic north and local irregularities in the planet's magnetic field require that charts and databases be updated at least 2 times per year to reflect the current magnetic variation correction from True north. For example, as of March 2010, near San Francisco the magnetic north is about 14.3 degrees east of True north, with the difference decreasing by about 6 minutes of arc per year.[4]

When plotting a course, a pilot in most small planes will plot a trip using true north on a sectional (map), then, convert the true north bearings to magnetic north for in-plane navigation using the magnetic compass. During flight, the correct compass course is obtained by a deviation correction card, which is usually located in the proximity of the compass.

Radio navigation aids located on the ground, such as VORs, are also checked and updated to keep them aligned with magnetic north to

allow pilots to use their magnetic compasses for accurate and reliable in-plane navigation.

Runways are named by a number between 01 and 36, which is generally one tenth of the magnetic azimuth of the runway's heading: a runway numbered 09 points east (90°), runway 18 is south (180°), runway 27 points west (270°) and runway 36 points to the north (360° rather than 0°).[5] However, due to magnetic declination, changes in runway names have to occur at times to keep their name in line with the runway's magnetic heading. An exception is made for runways which lie within the Northern Domestic Airspace of Canada; these are numbered relative to true north because proximity to the magnetic North Pole makes the magnetic declination large.

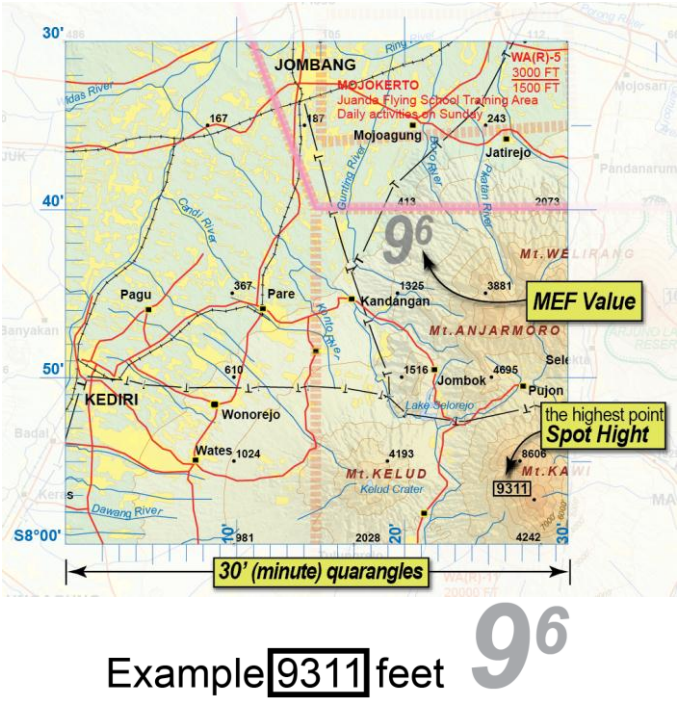
GPS systems used for air navigation can use magnetic north or true north. In order to make them more compatible with systems that depend on magnetic north, magnetic north is often chosen, at the pilot's preference. The GPS receiver natively reads in true north, but can elegantly calculate magnetic north based on its true position and data tables calculate the current location and direction of the north magnetic pole and (potentially) any local variations, if the GPS is set to use magnetic compass readings.

MAXIMUM ELEVATION FIGURE (MEF)

Maximum elevation figure or MEF is the a type of VFR altitude which indicates the height of the highest feature within a quadrangle area. It is of interest to pilots, who want to be aware of the highest mountain peaks and tall towers nearby, so they can fly above them to avoid controlled flight into terrain. ("Features" includes terrain, trees, towers, and other obstacles). In a VFR context, this altitude is commonly referred to as a "quadrantal altitude"

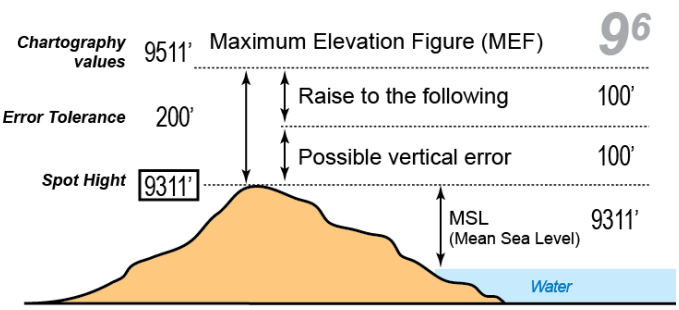
Maximum Elevation Figures (MEF) depicted on a sectional chart (SAC 1:500.000) Quadrant for every 30' (minute) and Operational Navigation Chart (ONC 1:1.000.000) Quadrant for every 1° (Degree) show the highest terrain and/or obstacles within a quadrant.

For man-made obstacles taller than 200 feet, the MEF is calculated by determining the elevation of the top of the obstacle above mean sea level (msl). Then, additional height is added according to a cartography formula to cover a possible vertical error. Finally, the figure is rounded up to the next highest 100-foot increment. For example, if the highest man-made obstacle within a sector is 2,424 feet msl, 100 feet would be added to cover a possible vertical error (2,524 feet). This figure would then be rounded up to the nearest 100 feet and be charted as a 2,624 feet MEF for that sector. A similar process is used for



Show the highest terrain and/or obstacles within a quadrant 30 Minute latitude and Longitude Sectional Chart. 1:500.000. .

calculating the MEF for terrain or natural obstacles, except that an additional 200 feet is added just in case there is a man-made obstacle on that terrain that wasn't charted because it is less than 200 feet tall.



Indoavis MEF is calculated

DOCUMENT REFERENCE

ICAO (International Civil Aviation Organization)

- ICAO Annex 4 Rules of the Air
- ICAO Annex 4 Aeronautical Chart
- ICAO Annex 5 Units of Measurement to be Used in Air and Ground Operations
- ICAO Annex 14 Aerodromes
- ICAO DOC. 8168 Aircraft Operations Vol-1,2
- ICAO DOC. 8697 Aeronautical Chart Manual
- ICAO DOC. 8400 (Procedure for Air Navigation Services)
- ICAO DOC. 9674 (World Geodetic System -1984 (WGS 84) Manual

FAA (Federal Aviation Administration)

- TERMINAL PROCEDURES PUBLICATION EXPLANATION OF TPP TERMS AND SYMBOLS
- IFR AERONAUTICAL CHARTS EXPLANATION OF IFR ENROUTE TERMS AND SYMBOLS
- VFR AERONAUTICAL CHARTS EXPLANATION OF VFR TERMS AND SYMBOLS

NOTES:

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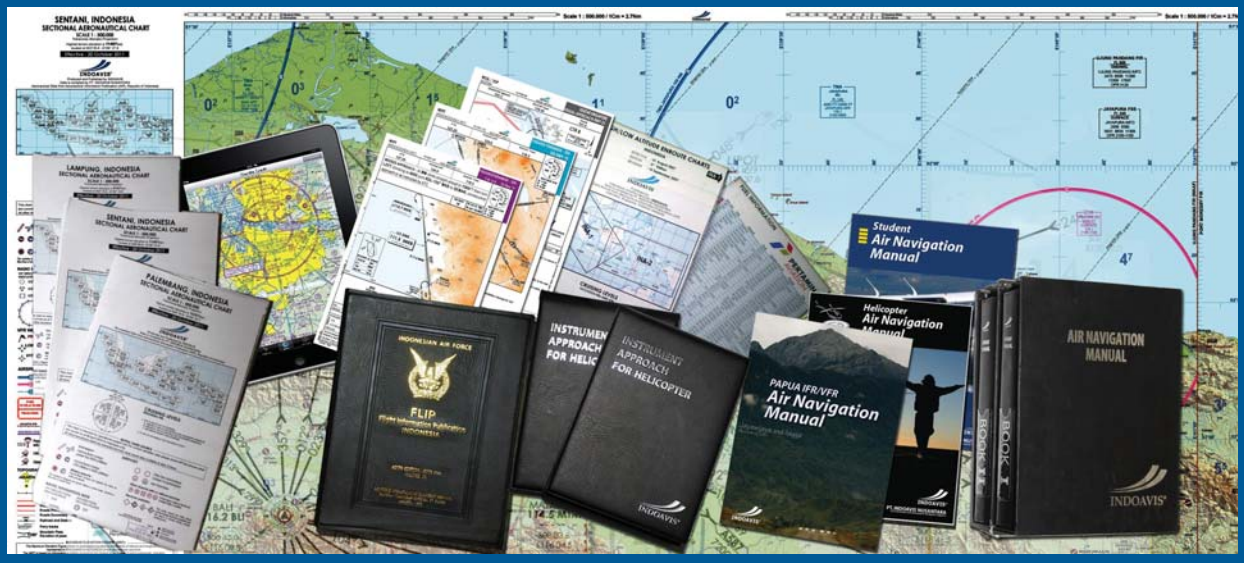

First published January 2009
Reprinted December 2011
Reprinted December 2012

INDVS 861212 599 5

Printed and distributed by:
Indoavis Doc-devision
Halim Perdana Kusuma Airport, Jakarta (13820) Indonesia