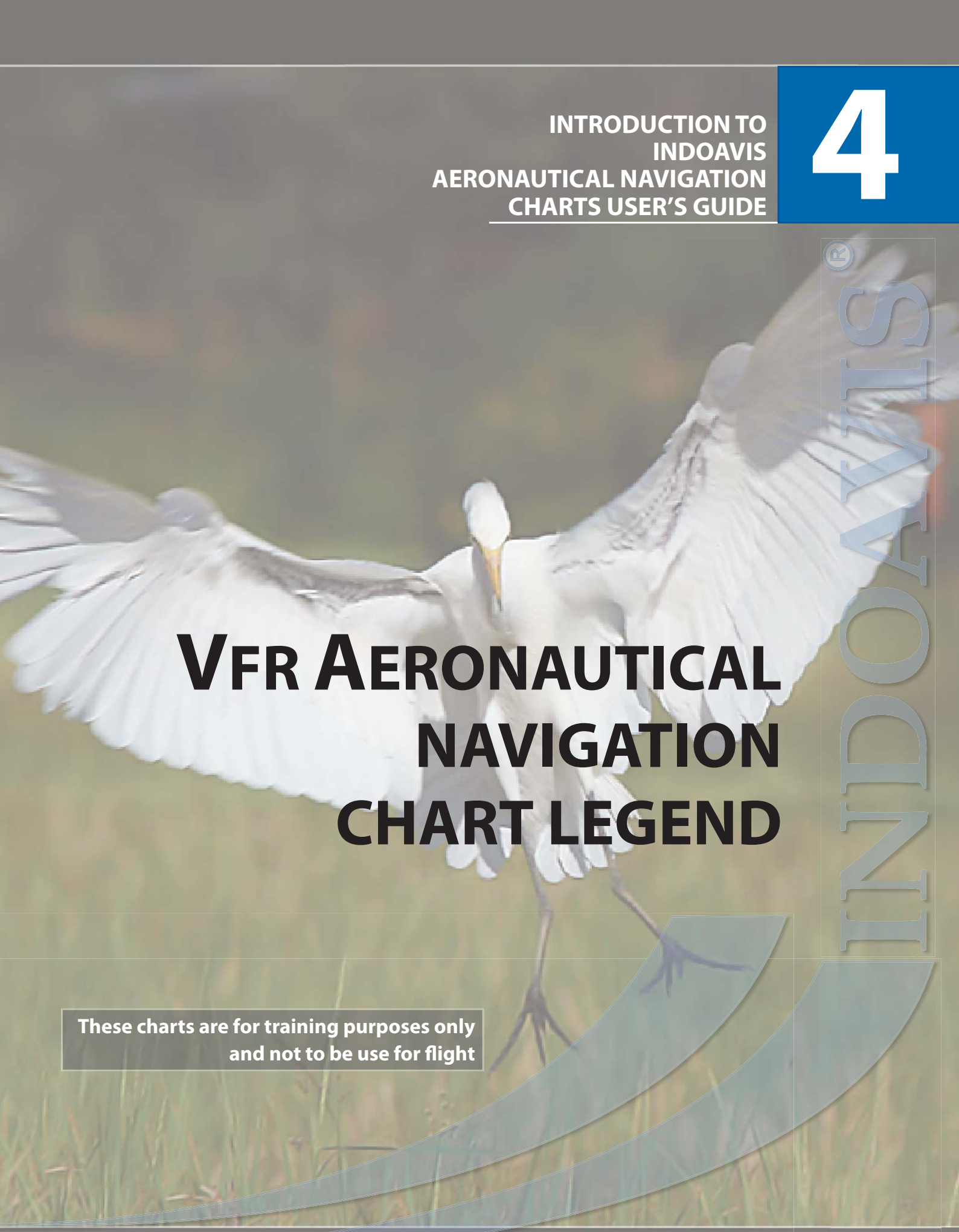
INTRODUCTION TO
INDOAVIS
AERONAUTICAL NAVIGATION
CHARTS USER'S GUIDE

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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Frequently asked questions (FAQ) are answered on our website at :
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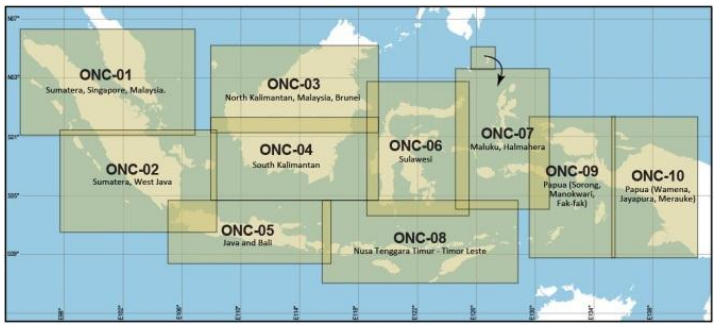
http://www.indoavis.net
email: info@indoavis.co.id / hal.londy@gmail.com

See the FAQs prior to contact number or email.

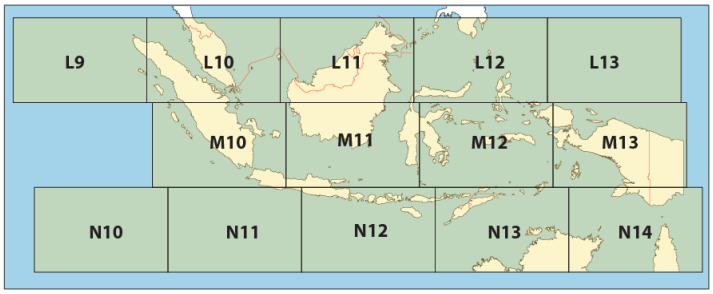
TECHNICAL SPECIFICATIONS

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

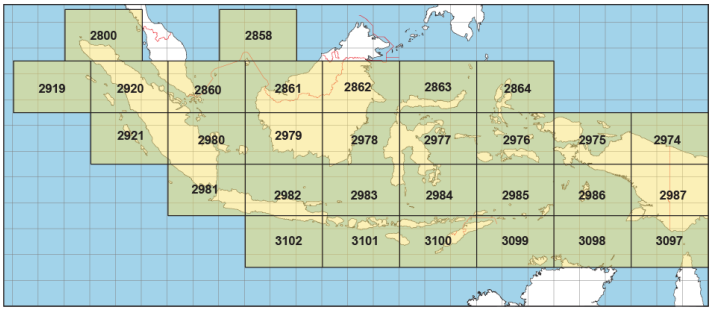


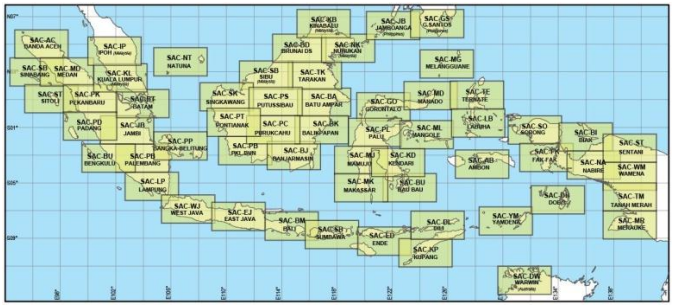
Chart Code	**S A C**
Chart Name	**SECTIONAL AERONAUTICAL CHART**
General Description	The Sectional Chart or Tactical Pilotage Chart, is designed to provide an intermediate scale translation of cultural and terrain features for pilots/navigators flying at very low altitudes (below 500 feet above ground 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

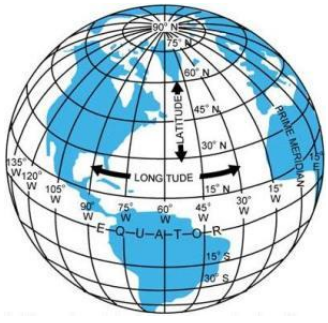
Three types of charts are used for VFR flight. These are:

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.

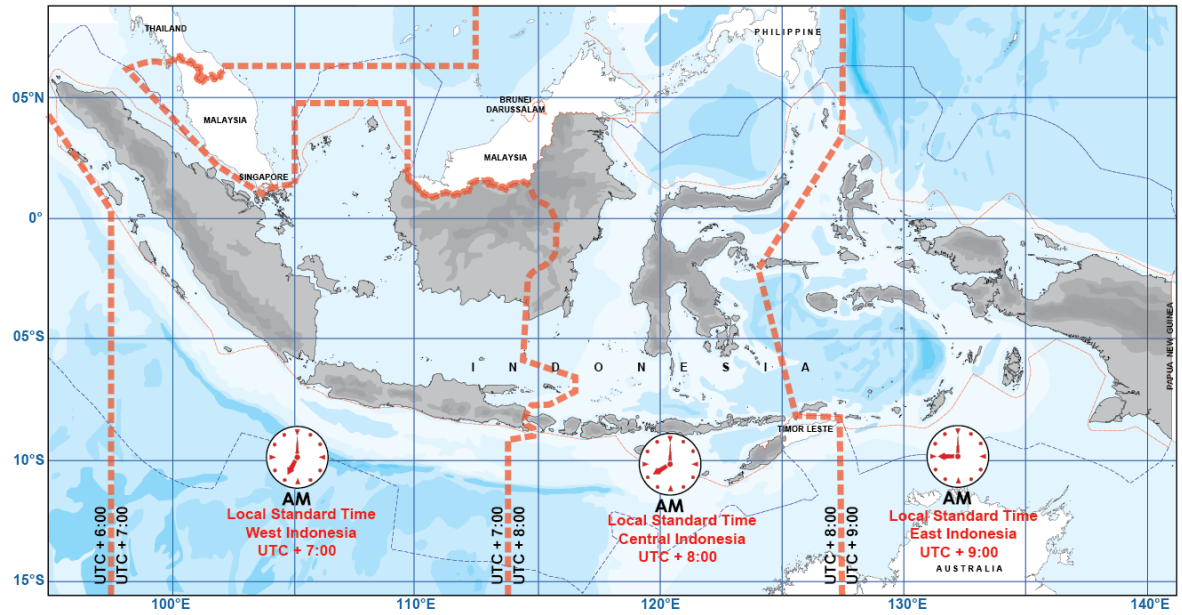
The lines running around the earth, parallel to the equator, are called lines of parallel (or parallels). They are measured from the equator to the poles in terms called degrees of latitude. They range from 0° latitude at the equator to 90° latitude at the poles. They are termed North latitude in the 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

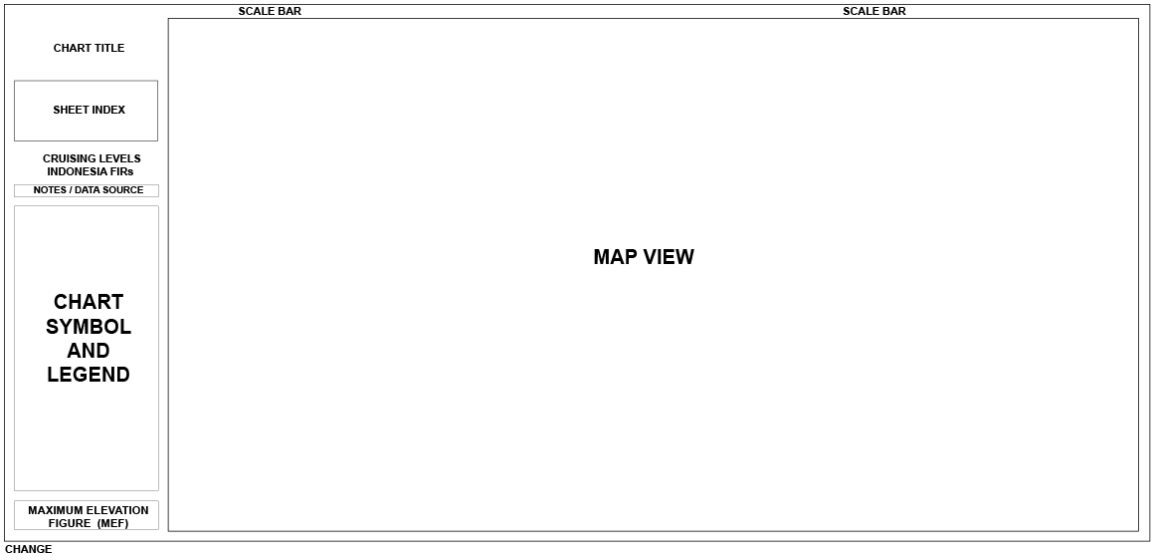
NOTE: If the local time is Daylight Savings Time, reduce the added hours by 1 Hour (4, 5, 6, 7 respectively).

Indonesia Time Zone Standard UTC:

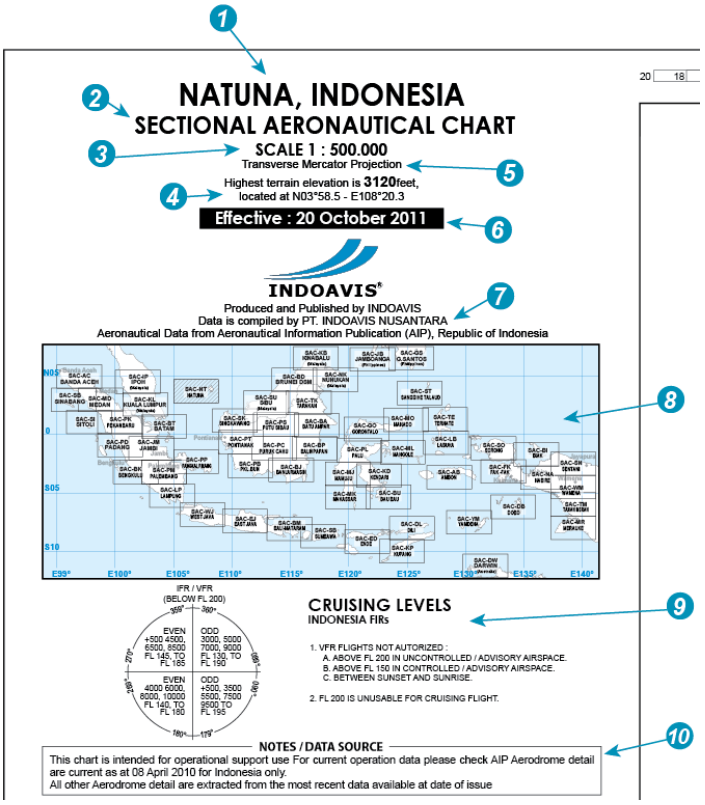
Indonesia West = UTC + 7hr
Indonesia Center = UTC + 8hr
Indonesia East = UTC + 9hr

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.

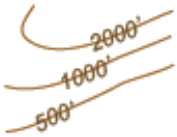
2.2. Airports Services available:

	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

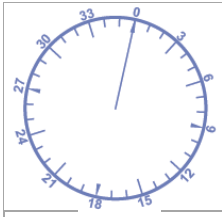
Obstruction symbols have two elevations shown near them. The one in **BOLD** letters (top number) is the elevation above mean sea level (MSL). The smaller numbers enclosed in parenthesis (bottom number) indicate the height above ground level (AGL). The symbols in the left hand column are less that 1000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

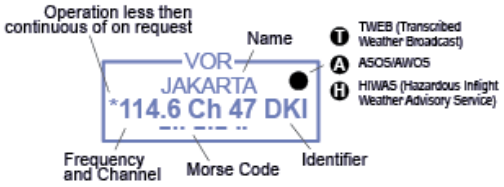
	Color tints are used to depict bands of elevation. These colors range from light green for the lowest elevations to brown for the higher elevations.  Contour lines are lines connecting points on the Earth of equal elevation. On Sectionals, basic contours are spaced at 500' and 1000' intervals.
	Shaded 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

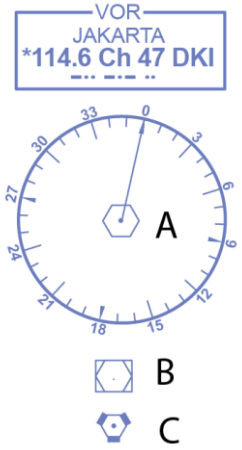
	Less than 1000' (AGL)		1000' &higher (AGL)		Group Obstruction

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.

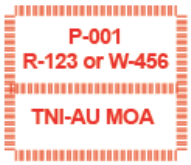
There are 3 types of VOR Ranges. They are indicated at the center of the rose.

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

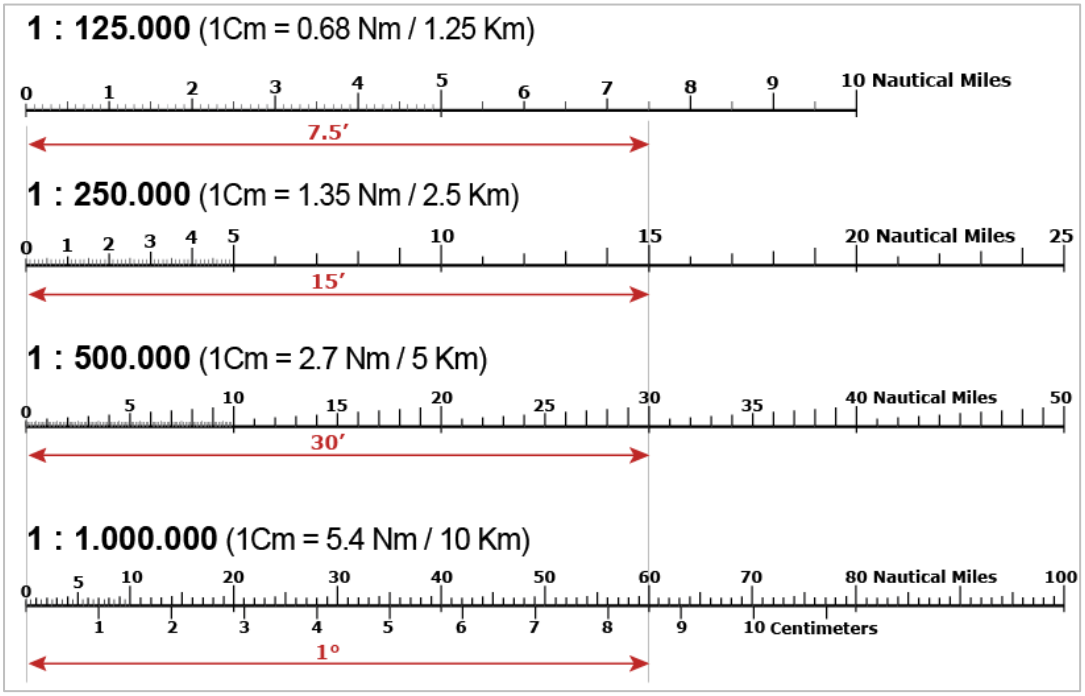
8. BOUNDARY

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