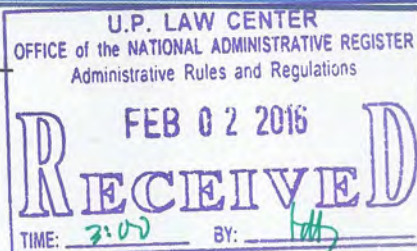




Republic of the Philippines
Department of Transportation and Communications
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES
Office of the Director General

MEMORANDUM CIRCULAR NO.: 04-16



TO : ALL CONCERNED

FROM : THE DIRECTOR GENERAL

SUBJECT : AMENDMENT TO PHILIPPINE CIVIL AVIATION
REGULATIONS - AIR NAVIGATION SERVICES (CAR-ANS)
PART 4 INCORPORATING AMENDMENT 58 TO ANNEX 4 AND
OTHER SUPPLEMENTARY AMENDMENTS TO CAR-ANS PART 4

REFERENCE:

1. Philippine Civil Aviation Regulations- Air Navigation Services
2. ICAO Annex 4
3. ICAO Annex 4; Amendment 58
4. Regulations Amendment Procedures
5. Board Resolution No. 2012-054 dated 28 September 2012

Pursuant to the powers vested in me under the Republic Act 9497, otherwise known as the Civil Aviation Authority Act of 2008 and in accordance with the Board Resolution No.: 2012-054 dated 28 September 2012, I hereby approve the incorporation of ICAO Annex 4 Amendment No. 58 to the Philippine Civil Aviation Regulations – Air Navigation Services (CAR-ANS) Part 4.

ORIGINAL REGULATION:

CAR-ANS PART 4

...

4.1. DEFINITIONS, APPLICABILITY AND AVAILABILITY

4.1.1 Definitions

...

Heliport. An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

...

Minimum obstacle clearance altitude (MOCA). The minimum altitude for a defined segment of flight that provides the required obstacle clearance.

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

4.9. STANDARD DEPARTURE CHART - INSTRUMENT (SID) - ICAO

...

"The Future is in the Skies"

4.9.9.3 Minimum sector altitude

4.9.9.3.1 The established minimum sector altitude, based on a navigation aid associated with the procedure, shall be shown with a clear indication of the sector to which it applies.

4.11. INSTRUMENT APPROACH CHART — ICAO

4.11.10.6 Portrayal of procedure tracks

4.11.10.6.3 A profile shall be provided normally below the plan view showing the following data:

f) altitudes/heights required by the procedures, including transition altitude and procedure altitudes/heights, where established;

APPENDIX 6. AERONAUTICAL DATA QUALITY REQUIREMENTS

Table 2. ELEVATION / ALTITUDE / HEIGHT

Elevation/altitude/height	Chart Resolution	Integrity Classification
Aerodrome/heliport elevation	1 m or 1 ft	essential
WGS-84 geoid undulation at aerodrome/heliport elevation position	1 m or 1 ft	essential
Runway or FATO threshold, non-precision approaches	1 m or 1 ft	essential
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, non-precision approaches	1 m or 1 ft	essential
Runway or FATO threshold, precision approaches	0.5 m or 1 ft	critical
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, precision approaches	0.5 m or 1 ft	critical
Obstacle Clearance Altitude/Height (OCA/H)	As specified in PANS-OPS (Doc 8168)	essential
Obstacles in Area 1 (the entire State territory)	3 m (10 ft)	routine
Obstacles in Area 2	1 m or 1 ft	essential
Obstacles in Area 3	1 m or 1 ft	essential
Distance Measuring Equipment (DME)	30 m (100 ft)	essential
Instrument approach procedures altitude	As specified in PANS-OPS (Doc 8168)	essential
Minimum altitudes	50 m or 100 ft	routine

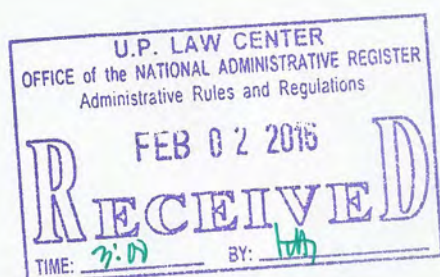


Table 3. DECLINATION AND MAGNETIC VARIATION

Declination and Magnetic Variation	Chart Resolution	Integrity Classification
VHF NAVAID station declination used for technical line-up	—	1x10 ⁻⁵ essential
NDB NAVAID magnetic variation	—	1x10 ⁻³ routine
Aerodrome/heliport magnetic variation	1 degree	1x10 ⁻⁵ essential
ILS localizer antenna magnetic variation	—	1x10 ⁻⁵ essential
MLS azimuth antenna magnetic variation	—	1x10 ⁻⁵ essential

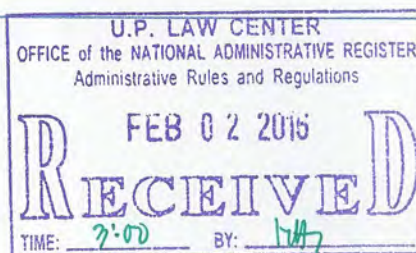
Table 5. BEARING

...

Table 6. LENGTH/ DISTANCE/ DIMENSION

AMENDED REGULATION:

...



4.1. DEFINITIONS, APPLICABILITY AND AVAILABILITY

4.1.1 Definitions

...

Aerodrome operating minima. The limits of usability of an aerodrome for:

...

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;

...

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.

...

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

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

...

Data product specification. Detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party (ISO 19131*).

Note.— A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a data set. It may be used for production, sales, end-use or other purpose.

...

Datum. Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities (ISO 19104*).

Digital Elevation Model (DEM). The representation of terrain surface by continuous elevation

values at all intersections of a defined grid, referenced to common datum.

...

Flight level. 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;*

Heliport. An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

Heliport reference point (HRP). The designated location of a heliport or a landing location.

...

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

...

Integrity classification (aeronautical data). Classification based upon the potential risk resulting from the use of corrupted data. Aeronautical data is classified as:

...

Intermediate holding position. A designated position intended for traffic control at which taxiing aircraft and vehicles shall stop and hold until further cleared to proceed, when so instructed by the aerodrome control tower.

...

Minimum en-route altitude (MEA). The altitude for an enroute segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance.

Minimum obstacle clearance altitude (MOCA). The minimum altitude for a defined segment of flight that provides the required obstacle clearance.

Minimum sector altitude (MSA). The lowest altitude which may be used which will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an area contained within a sector of a circle of 46 km (25 NM) radius centered on a significant point, the aerodrome reference point (ARP), or the heliport reference point (HRP).

...

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

...

4.2 GENERAL SPECIFICATIONS

...

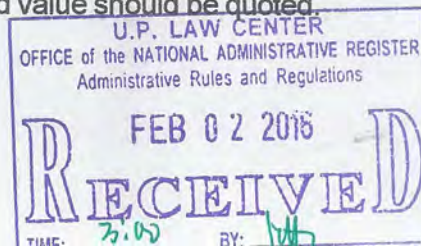
Phase 5-Approach to the Land and Missed approach

...

4.2.15.1 True north magnetic variation shall be indicated. The order of resolution of magnetic variation shall be that as specified for a particular chart.

4.2.15.2 When magnetic variation is shown on a chart, the values shown should be those for the year nearest to the date of publication that is divisible by 5, i.e. 1980, 1985 etc. In exceptional cases where the current value would be more than one degree different, after applying the calculation for annual change, an interim date and value should be quoted.

...



4.2.17 Aeronautical data

4.2.17.1 CAAP or aeronautical chart producing company shall take all necessary measures to introduce a properly organized quality system containing procedures, processes and resources necessary to implement quality management at each function stage as outlined in CAR-ANS Part 15, 15.3.1.7. The execution of such management shall be made demonstrable of each function stage when required. In addition, CAAP or aeronautical chart producing company shall ensure that established procedures exist in order that aeronautical data at any moment are traceable to its origin so to allow any data anomalies or error, detected during the production/maintenance phases or in the operational use, be corrected.

Note—Specification governing the quality system are given in CAR-ANS Part 15, 15.3.

...

4.2.17.3 CAAP shall ensure that integrity of aeronautical data is maintained throughout the data process from survey/origin to the next intended user. Based on the applicable integrity classifications, the validation and verification procedures shall:

...

Note 1. – Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 – Standards for Processing Aeronautical Data.

...

4.2.18 Common reference system

...

4.2.18.1.2 Geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in CAR-ANS Part 11, 11.1.2 and CAAP MOS Aerodromes Chapter 1 Section 1.2 shall be identified by asterisk.

4.2.18.1.3 The order of chart resolution of geographical coordinates shall be that specified for a particular chart series and in accordance with Appendix 6, Table 1.

Note—Specifications governing the determination and reporting {accuracy of field work and data integrity} of WGS-84 related aeronautical coordinates for geographical positions established by Air Traffic Service are given in CAR-ANS Part 11, Appendix 11.5 Table 1: and for aerodrome/heliport-related positions, in Annex 14, Volume I and II, Chapter 2 and in Table 1 of Appendices 5 and 1 respectively.

...

4.3. AERODROME OBSTACLE CHART — ICAO TYPE A (OPERATING LIMITATIONS)

4.3.1 Function

This chart, in combination with the Aerodrome Obstacle Chart — ICAO Type C or with the relevant information published in the AIP, shall provide the data necessary to enable an operator to comply with the operating limitations of PCARs Part 8.

...

4.3.8.3 Declared distances

...

Note.— In CAAP MOS Aerodromes Chapter 5, guidance is given on declared distances.

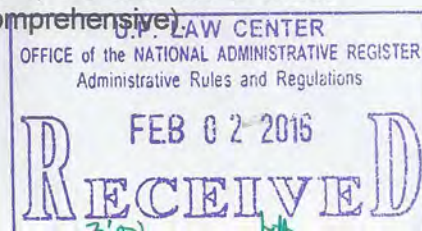
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4.4.2 Availability

...

4.4.2.2 When a chart combining the specifications of CAR-ANS Part 4, 4.3 and 4.4 is made available, it shall be called the Aerodrome Obstacle Chart — ICAO (Comprehensive).

4.4.5 Format



...

c) a notation indicating that obstacles are those which penetrate the surfaces specified in CAAP MOS Aerodromes Chapter 7;

...

4.4.7 Culture and topography

...

4.4.7.3 All objects, either cultural or natural, that project above the take-off and approach surfaces specified in 4.4.9 or the clearing and marking surfaces specified in CAAP MOS Aerodromes Chapter 7, shall be shown.

...

4.4.9 Aeronautical data

4.4.9.1 The charts shall show:

l) take-off and approach areas;

Note.— The take-off area is described in 4.3.8.2.1. The approach area consists of an area on the surface of the earth lying directly below the approach surface as specified in CAAP MOS Aerodromes Chapter 7. The approach area consists of an area on the surface of the earth lying directly below the approach surface as specified in CAAP MOS Aerodromes Chapter 7.

...

4.5 AERODROME TERRAIN AND OBSTACLE CHART — ICAO (ELECTRONIC)

4.5.1 Function

This electronic chart shall portray the terrain and obstacle data in combination with aeronautical data, as appropriate, necessary to:

a) enable an operator to comply with the operating limitations of PCARs Part 8 by developing contingency procedures for use in the event of an emergency during a missed approach or take-off, and by performing aircraft operating limitations analysis; and

...

4.5.4 Chart coverage

4.5.4.1 The extent of each chart shall be sufficient to cover Area 2 as specified in CAR-ANS Part 15, 15.10.2.

4.5.5 Chart content

...

4.5.5.2.1 The terrain feature, and associated attributes, to be portrayed and database linked to the chart shall be based on the electronic terrain data sets which satisfy the requirements of CAR-ANS Part 15, Chapter 10 and Appendix 5G.

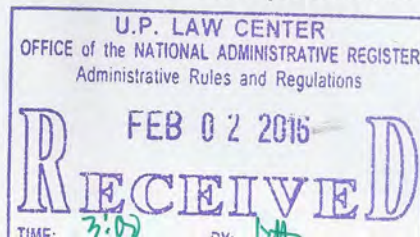
...

Note.— In accordance with CAR-ANS Part 15, Chapter 10 and Appendix 5G, the DEM for Area 2 post spacing (grid) is specified at 1 arc second (approximately 30 m).

...

4.5.5.2.6 Other terrain attributes specified in CAR-ANS Part 15 Table 15G-3 and provided in the database(s) should be linked to the portrayed terrain feature.

4.5.5.3 Obstacle features



4.5.5.3.1 Obstacle features, and associated attributes, portrayed or database-linked to the chart shall be based on electronic obstacle data sets which satisfy the requirements of CAR-ANS Part 15 Table 15G-3.

...

4.5.5.3.4 Other obstacle attributes specified in CAR-ANS Part 15 Table 15G-4 and provided in the database(s) should be linked to the portrayed obstacle feature.

4.5.5.4 Aerodrome features

4.5.5.4.1 Aerodrome features, and associated attributes, portrayed and database-linked to the chart shall be based on aerodrome data which satisfy the requirements of Annex 14, Volume I, Appendix 5 and CAR-ANS Part 15, Appendix 15F.

...

4.5.5.4.3 The portrayed aerodrome feature shall be linked to the following associated attributes in the database(s):

...

Note.— CAAP MOS Aerodromes Chapter 5 provides guidance on declared distances.

...

4.5.6 Accuracy and resolution

4.5.6.1 The order of accuracy of aeronautical data shall be as specified in CAR-ANS Part 11, Appendix 11.5 and Annex 14, Volume I, Appendix 5 and Volume II, Appendix 1. The order of accuracy of terrain and obstacle data shall be as specified in CAR-ANS 15, Appendix 15G.

4.5.6.2 The aeronautical data resolution shall be as specified in CAR-ANS Part 15, Appendix 15F while the resolution for terrain and obstacle data shall be as specified in CAR-ANS Part 15 Appendix 15G.

...

4.7. ENROUTE CHART — ICAO

...

4.7.9 Aeronautical data

...

4.7.9.3.2 The components shall include the following:

...

10) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 meters or 100 feet (see CAR-ANS Part 11, 11.2.21);

...

4.8. AREA CHART — ICAO

4.8.1 Function

...

Note.— The function described in 4.8.1 c) may be satisfied by a separate chart or an inset on an Enroute Chart — ICAO.

...

4.8.9 Aeronautical data

...

4.8.9.4.1.1 The components shall include the following:

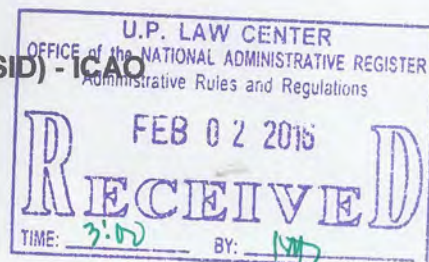
...

11) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 m or 100 ft (see CAR-ANS Part 11, 11.2.21);

...

4.9. STANDARD DEPARTURE CHART - INSTRUMENT (SID) - ICAO

...



4.9.9.3 Minimum sector altitude

4.9.9.3.1 The established minimum sector altitude shall be shown with a clear indication of the sector to which it applies.

...

4.10. STANDARD ARRIVAL CHART - INSTRUMENT (STAR) - ICAO

...

4.10.5 Identification

4.10.5.1 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 arrival route(s) C instrument as established in accordance with the *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS, Doc 8168), Volume II, Part III, Chapter 3.

4.11. INSTRUMENT APPROACH CHART — ICAO

...

4.11.10.4.2 The initial approach fix (IAF), the intermediate approach fix (IF), the final approach fix (FAF) (or final approach point (FAP) for an ILS approach procedure), the missed approach point (MAPt), where established, and other essential fixes or points comprising the procedure shall be shown and identified.

...

4.11.10.6 Portrayal of procedure tracks

...

4.11.10.6.3 A profile shall be provided normally below the plan view showing the following data:

...

f) altitudes/heights required by the procedures, including transition altitude, procedure altitudes/heights, and heliport crossing height (HCH) where established;

g) limiting distance to the nearest kilometer or nautical mile on procedure turn, when specified;

h) the intermediate approach fix or point, on procedures where no course reversal is authorized;

i) a line representing the aerodrome elevation or threshold elevation, as appropriate, extended across the width of the chart including a distance scale with its origin at the runway threshold.

...

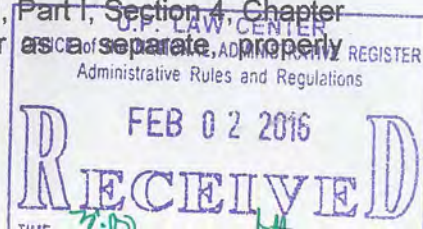
4.11.10.8.6 For precision approach procedures and approach procedures with vertical guidance, the reference datum height to the nearest half meter or foot and the glide path/elevation/ vertical path angle to the nearest one-tenth of a degree shall be shown.

...

4.11.10.8.8 If the final approach descent gradient/angle for any type of instrument approach procedure exceeds the maximum value specified in the *Procedures for Air Navigation Services Aircraft Operations* (PANS-OPS, Doc 8168), Volume II, Part I, Section 4, Chapter 5, a cautionary note shall be included.

4.11.10.9 Aeronautical data base requirements

Appropriate data to support navigation database coding shall be published in accordance with the *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS, Doc 8168), Volume II, Part III, Section 5, Chapter 2, 2.3 for RNAV procedures and Volume II, Part I, Section 4, Chapter 9, 9.4.1.4 for non-RNAV procedures, on the verso of the chart or as a separate, properly referenced sheet.



...
4.13. AERODROME/HELIPORT CHART — ICAO
...

4.13.6.2 In addition to the items in 4.13.6.1 relating to heliports, the chart shall show:

a) heliport type;

Note.— Heliport types are identified in CAAP MOS Aerodromes Chapter 15, as surface- level, elevated or helideck.
...

4.14. AERODROME GROUND MOVEMENT CHART — ICAO
...

4.14.6 Aerodrome data
...

e) where established, hot spot locations with additional information properly annotated;
...

4.16. WORLD AERONAUTICAL CHART — ICAO 1:1 000 000
...

4.16.5 Projection

4.16.5.1 The projections shall be as follows:

- 1) between the Equator and 80° latitude: the Lambert conformal conic projection, in separate bands for each tier of charts. The standard parallels for each 4° band shall be 40' south of the northern parallel and 40' north of the southern parallel;

...
4.17. AERONAUTICAL CHART — ICAO 1:500 000
...

4.17.7.4 Contours

4.17.7.4.1 Contours shall be shown. The selection of intervals shall be governed by the requirement to depict clearly the relief features required in air navigation.

4.17.7.4.2 The values of the contours used shall be shown.
...

4.20. ELECTRONIC AERONAUTICAL CHART DISPLAY — ICAO

4.20.1 Function

4.20.1.1 The Electronic Aeronautical Chart Display — ICAO, with adequate back-up arrangements and in compliance with the requirements of PCARs Part 8 for charts, shall enable flight crews to execute, in a convenient and timely manner, route planning, route monitoring and navigation by displaying required information.
...

4.20.2 Information available for display

4.20.2.1 The Electronic Aeronautical Chart Display — ICAO shall be capable of displaying all aeronautical, cultural and topographic information required by CAR-ANS Part 4, Chapter 5 and

Chapters 7 through 19.

4.20.2.2 The Electronic Aeronautical Chart Display — ICAO should be capable of displaying all aeronautical, cultural and topographic information recommended by CAR-ANS Part 4 Chapter 5 and Chapters 7 through 19.

...

4.20.4 Provision and updating of data

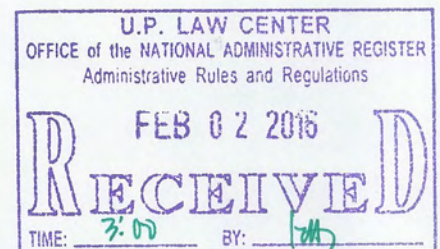
...

Note.— For aeronautical data quality system requirements see CAR-ANS Part 4, 4.2.17 and CAR-ANS Part 15, Chapter 15, 15.3.2.

...

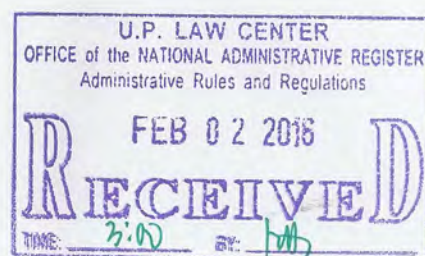
4.21.3 Coverage and scale

4.21.3.1 The coverage of the chart shall be sufficient to effectively show the information associated with vectoring procedures.

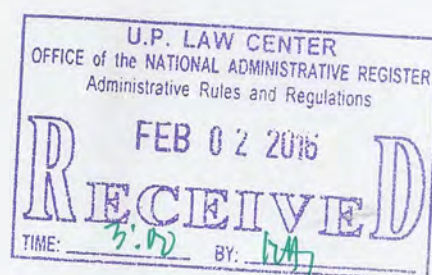


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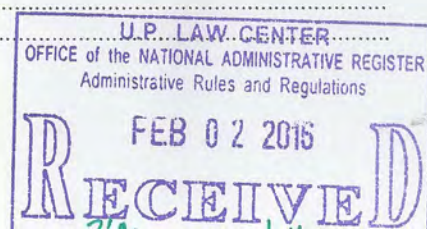
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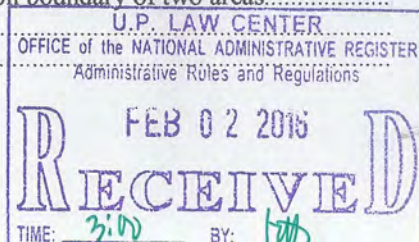
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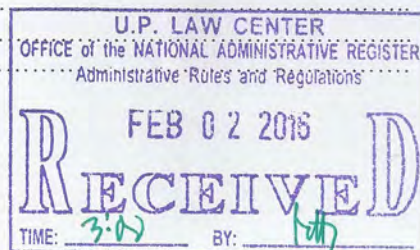
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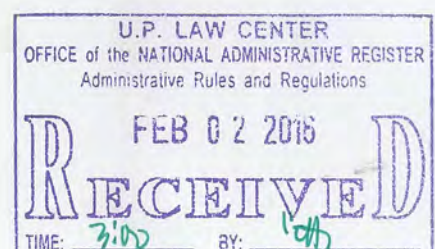
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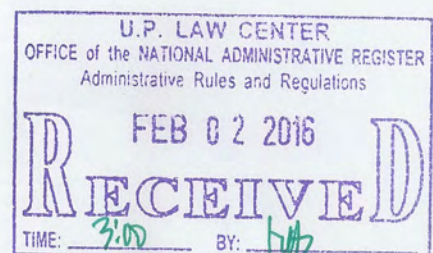
AERODROMES (Cont.)
AERODROME DATA IN ABBREVIATED FORM WHICH MAY BE
IN ASSOCIATION WITH AERODROME SYMBOLS
(Reference 4.16.9.2.2 and 4.17.9.2.2)

96	Name of aerodrome LIVINGSTONE 357 L H 95 Elevation given in the units of measurement (metres or feet) selected for use on the chart Minimum lighting - obstacles, boundary or runway lights and lighted wind indicator or landing direction indicator Length of longest runway in hundreds of metres or feet [whichever unit is selected for use on the chart] Runway hard surfaced, normally all weather <i>Note - A dash (-) is to be inserted where L or H do not apply</i>
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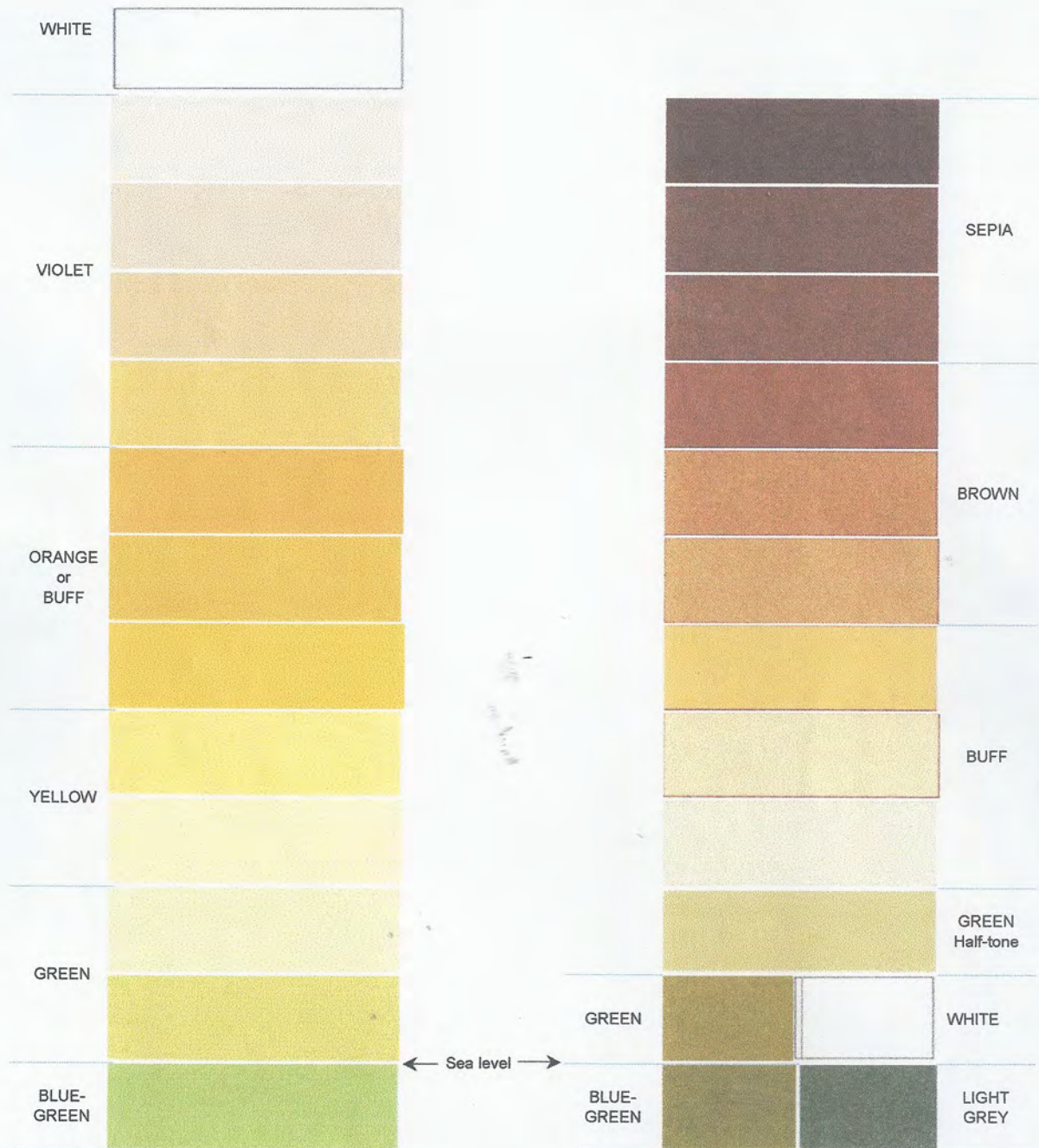
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97	Aerodromes affecting the traffic pattern on the aerodrome on which the procedure is based	
98	The aerodromes on which the procedure is based	

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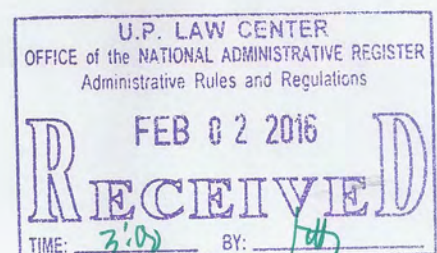


APPENDIX 4. HYPSONOMETRIC TINT GUIDE *(Alternative systems, reference 4.2.12.2)*



Note 1.- These tints are identical to those specified for the International map of the World.

Note 2.- Elevations have not been associated with tints of either system in order to allow for flexibility in their section.



APPENDIX 6. AERONAUTICAL DATA QUALITY REQUIREMENTS

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Table 2. ELEVATION / ALTITUDE / HEIGHT

Elevation/altitude/height	Chart Resolution	Integrity Classification
Aerodrome/heliport elevation	1 m or 1 ft	essential
WGS-84 geoid undulation at aerodrome/heliport elevation position	1 m or 1 ft	essential
Runway or FATO threshold, non-precision approaches	1 m or 1 ft	essential
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, non-precision approaches	1 m or 1 ft	essential
Runway or FATO threshold, precision approaches	0.5 m or 1 ft	critical
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, precision approaches	0.5 m or 1 ft	critical
Obstacle Clearance Altitude/Height (OCA/H)	As specified in PANS-OPS (Doc 8168)	essential
Obstacles in Area 1 (the entire State territory)	3 m (10 ft)	routine
Obstacles in Area 2	1 m or 1 ft	essential
Obstacles in Area 3	1 m or 1 ft	essential
Distance Measuring Equipment (DME)	30 m (100 ft)	essential
Instrument approach procedures altitude	As specified in PANS-OPS (Doc 8168)	essential
Minimum altitudes	50 m or 100 ft	routine
Heliport crossing height, PinS approaches	1 m or 1 ft	essential

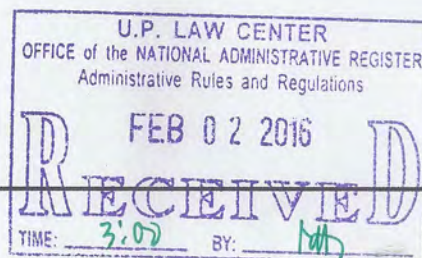
Table 3. GRADIENTS AND ANGLES

Type of gradient/angle	Chart Resolution	Integrity Classification
Non-precision final approach descent gradient...	0.1 per cent	critical
Final approach descent angle (non-precision approach or approach with vertical guidance.....)	0.1 degree	critical
Precision approach glide path/elevation angle....	0.1 degree	critical

Table 4. MAGNETIC VARIATION

Magnetic Variation	Chart Resolution	Integrity Classification
Aerodrome/heliport magnetic variation.....	1 degree	essential

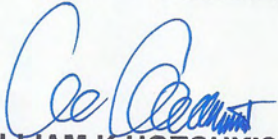
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EFFECTIVITY CLAUSE:

This amendment shall be added to the PCAR-ANS Part 4 and shall take effect immediately and shall supersede any other memoranda, regulations, and directives in conflict with this provision after compliance with the requisite single newspaper publication and a copy filed with the U.P. Law Center- Office of the National Administrative Register.

So ordered. Signed this 26 day of JAN 2016, CAAP, Pasay City.



LT GEN WILLIAM K HOTCHKISS III AFP (Ret)

