



MEMORANDUM CIRCULAR NO.: 016-2024

TO : ALL CONCERNED  
FROM : THE DIRECTOR GENERAL  
SUBJECT : AMENDMENT 7 TO THE FOURTH ISSUE OF PHILIPPINE  
CIVIL AVIATION REGULATIONS – AIR NAVIGATION  
SERVICES PART 4 AERONAUTICAL CHARTS

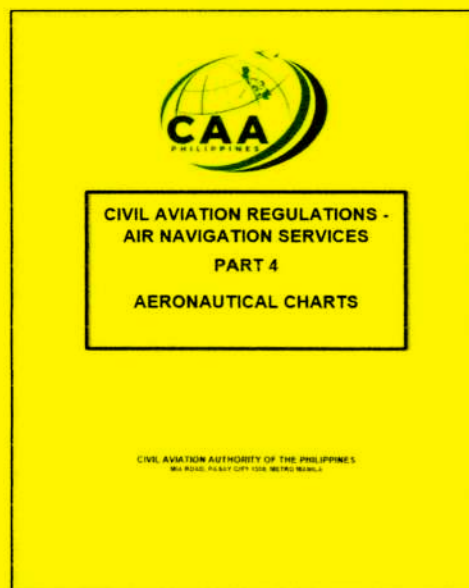
**REFERENCE:**

1. Civil Aviation Regulations- Air Navigation Services Part 4 Issue 4
2. CAAP Regulations Amendment Procedures
3. 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 following amendments to the Philippine Civil Aviation Regulations- Air Navigation Services Part 4.

**ORIGINAL REGULATION SUBJECT FOR REVIEW AND REVISION:**

**CIVIL AVIATION REGULATIONS – AIR NAVIGATION SERVICES PART 4**



*(Editorial Note: This will be the new cover page of CAR-ANS Part 4)*

**Approval Page**

**Republic of the Philippines**

**CIVIL AVIATION REGULATIONS  
AIR NAVIGATION SERVICES  
(CAR-ANS)**

**PART 4**

**Governing**

**AERONAUTICAL CHARTS**

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**FOREWORD**

~~This Civil Aviation Regulations Air Navigation Services Part 4 (CAR-ANS Part 4) was formulated and issued by the Civil Aviation Authority of the Philippines (CAAP), prescribing the Standards and Recommended Practices for Aeronautical Charts service providers in order to ensure the production and availability of Aeronautical Charts for the safety, regularity and efficiency of international air navigation.~~

Pursuant to the provisions of Article 37 and Article 25 of the convention of International Civil Aviation, the Civil Aviation Authority of the Philippines (CAAP) formulated and issued this Civil Aviation Regulations-Air Navigation Services Part 4 (CAR-ANS Part 4), establishing rules and regulations relating to Aeronautical Charts.

~~This Civil Aviation Regulations Air Navigation Services Part 4 (CAR-ANS Part 4) was developed based on the Standards and Recommended Practices prescribed by the International Civil Aviation Organization (ICAO) as contained in Annex 4 which was first adopted by the Council on 16 April 1948 pursuant to the provisions of Article 37 of the Convention of International Civil Aviation (Chicago 1944), and consequently became applicable on 1 March 1949.~~

This CAR-ANS Part 4 was also developed based on the Standards and Recommended Practices prescribed by the International Civil Aviation Organization (ICAO) as contained in Annex 4 – Aeronautical Charts.

~~The procedures contained herein are issued by authority of the Director General of the Civil Aviation Authority of the Philippines and will be complied with by all concerned.~~

CAR-ANS Part 4 provides the requirements for Aeronautical Charts service providers in order to ensure the production and availability of Aeronautical Charts for the safety, regularity and efficiency of international air navigation.

~~As used in this Civil Aviation Regulations Air Navigation Services Part 4 (CAR-ANS Part 4), “Appropriate Authority” means the Director General of the Civil Aviation (DGCA) of the Philippines.~~

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## **I. PURPOSE**

This Civil Aviation Regulation provides the rules and regulations in governing the provisions of aeronautical charts in the Philippines.

## **II. AUTHORITY**

The regulations contained herein are issued by authority of the Director General of CAAP by the virtue of Board Resolution No. 2012-054 and shall be complied with by all concerned.

## **III. APPLICABILITY**

The rules and regulations herein prescribed shall apply to the planning, charting, editing production, maintenance/review and classification of aeronautical charts for both governmental and non-governmental charting agencies.

## **IV. REPEALING PROVISIONS**

All previous Administrative Orders, Memorandum Circulars or part thereof as they pertain to aeronautical charts which are inconsistent with the provisions of this Civil Aviation Regulations are hereby repealed, amended or modified accordingly.

## **V. SEPARABILITY PROVISIONS**

The provisions of this Civil Aviation Regulations are hereby declared separable. If any portion thereof shall be held invalid or unconstitutional, such invalidity or unconstitutionality shall not affect the other provisions which shall be in full force and effect.

## **VI. DISTRIBUTION**

This Civil Aviation Regulation will be distributed to all service providers involved in the flight procedures design, production or publication of aeronautical charts, air traffic services facilities and organizations involved in flight operations.

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### **4.1 DEFINITIONS**

#### **4.1.1 DEFINITIONS**

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**Navigation specification.** A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

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**Area navigation (RNAV) specification.** A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

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**Note 2.—** The term RNP, previously defined as “a statement of the navigation performance necessary for operation within a defined airspace”, has been removed from this Annex CAR-ANS as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this

*Annex CAR-ANS is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in ICAO Document 9613.*

**Obstacle.** All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight.

*Note.— The term obstacle is used in this Annex CAR-ANS solely for the purpose of specifying the charting of objects that are considered a potential hazard to the safe passage of aircraft in the type of operation for which the individual chart series is designed.*

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#### **4.1.2 APPLICABILITY**

~~4.1.2.1 The rules and regulations herein prescribed shall apply to the planning, charting, editing, production, maintenance/review and classification of aeronautical charts for both governmental and non-governmental charting agencies.~~

#### **4.1.2 ABBREVIATIONS**

<b>ADA</b>	Advisory airspace
<b>ADR</b>	Advisory route
<b>ADIZ</b>	Air Defense Identification Zone
<b>AIRAC</b>	Aeronautical Information Regulation and Control
<b>AIP</b>	Aeronautical Information Publication
<b>AMA</b>	Area Minimum Altitude
<b>ATS</b>	Air Traffic Service
<b>ATZ</b>	Aerodrome Traffic Zone
<b>AWY</b>	Airway
<b>CAAP</b>	Civil Aviation Authority of the Philippines
<b>CAR-ANS</b>	Civil Aviation Regulations – Air Navigation Service
<b>COP</b>	Change-over Point
<b>CRC</b>	Cyclic Redundancy Check
<b>CTA</b>	Control Area
<b>CWY</b>	Clearway
<b>DEM</b>	Digital Elevation Model
<b>DME</b>	Distance Measuring Equipment
<b>FAF</b>	Final Approach Fix
<b>FAP</b>	Final Approach Point
<b>FATO</b>	Final Approach and Take-off Area
<b>FIR</b>	Flight Information Region
<b>HCH</b>	Heliport Crossing Height
<b>HRP</b>	Heliport Reference Point
<b>IAF</b>	Initial Approach Fix

<b>ICAO</b>	International Civil Aviation Organization
<b>ILS</b>	Instrument Landing System
<b>IMW</b>	International Map of the World
<b>ISO</b>	International Organization for Standardization
<b>MEA</b>	Minimum En-route Altitude
<b>MOCA</b>	Minimum Obstacle Clearance Altitude
<b>MOS</b>	Manual of Standards
<b>MOS-AIS</b>	Manual of Standards – Aeronautical Information Service
<b>MRP</b>	MET Reporting Point
<b>MSA</b>	Minimum Sector Altitude
<b>MSL</b>	Mean Sea Level
<b>MAPt</b>	Missed Approach Point
<b>NDB</b>	Non-directional Radio Beacon
<b>OCA</b>	Obstacle Clearance Altitude
<b>OCH</b>	Obstacle Clearance Height
<b>OFZ</b>	Obstacle Free Zone
<b>PCAR</b>	Philippine Civil Aviation Regulations
<b>PBN</b>	Performance-based Navigation
<b>RNAV</b>	Area Navigation
<b>RVR</b>	Runway Visual Range
<b>SATVOICE</b>	Satellite Voice Communications
<b>SID</b>	Standard Departure Chart — Instrument
<b>STAR</b>	Standard Arrival Chart — Instrument
<b>SWY</b>	Stopway
<b>TAA</b>	Terminal Arrival Altitude
<b>TLOF</b>	Touchdown and Lift-off Area
<b>UTC</b>	Coordinated Universal Time
<b>VFR</b>	Visual Flight Rules
<b>VOR</b>	VHF Omnidirectional Range
<b>WGS-84</b>	World Geodetic System -1984

#### 4.1.3 AVAILABILITY

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4.1.3.2.2 For any chart or single sheet of a chart series which includes the territory of two or more Contracting States, the States having jurisdiction over the territory so included shall determine the manner in which the chart or sheet will be made available. This determination shall be made with due regard being given to regional air navigation agreements and to any programme program of allocation established by the Council of ICAO.

*Note.— The phrase “regional air navigation agreements” refers to the agreements approved by the Council of ICAO normally on the advice of regional air navigation meetings.*

4.1.3.3 CAAP shall take all reasonable measures to ensure that the information it provides and the aeronautical charts made available are adequate and accurate and that they are maintained up to date by an adequate revision service.

4.1.3.4 To improve worldwide dissemination of information on new charting techniques and production methods, appropriate charts produced by CAAP shall be made available without charge to other Contracting States on request on a reciprocal basis.

*Note.— Guidance material on the preparation of aeronautical charts, including sample formats, is contained in the Aeronautical Chart Manual (ICAO Document 8697).*

#### **4.1.4 RULES OF CONSTRUCTION**

##### **Terminology**

Through this regulation the following word usage applies:

- a) *Shall* indicates a mandatory requirement.
- b) *May* indicates that discretion can be used when performing an act described in a regulation.
- c) *Will* indicates an action incumbent upon the Authority.

#### **4.1.5 AMENDMENT/REVISION TO CAR-ANS PART 4**

Proposals for any amendment or revision to CAR-ANS Part 4 shall be submitted to the Technical Working Group (TWG) of the Air Traffic Management Safety Inspectorate Division (ATMSID). Whether it is an ICAO Annex 4 adopted amendment or any amendment or revision initiated by CAAP or by any other aviation stakeholders, the ATMSID TWG shall submit the deliberated proposal to the Regulations Review Committee (RRC) for furtherance.

The Chairman of the RRC shall be the Director General or his authorized representative and the Vice Chairman for CAR -ANS Part 4 related matters shall be the Chief of AANSOO. The Secretariat of the RRC on matters concerning CAR-ANS Part 4 shall be the current Chief of the Regulatory Safety Standards Division (RSSD) of AANSOO.

The RRC shall follow the procedures prescribed in the Regulations Amendment/ Revision Procedure (RAP) in deciding on the amendment or revision to or any other proposals associated with it. Once the amendment or revision is reviewed and endorsed by the RRC for the approval of the Director General, it shall have to be published in the Official Gazette of the Philippines or in a newspaper of general circulation. A copy of this published amendment/revision to regulations must be filed to the University of the Philippines Law Center - Office of the National Administrative Register (UP-ONAR).

The Chairman of the RRC shall convene the committee during regular meetings or at the instance of the Chairman or Vice-Chairmen and follow the Internal Rules of Procedures prescribed in the RAP.

#### **4.2 GENERAL SPECIFICATIONS**

#### **4.2.1 Operational Requirements for Charts**

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4.2.1.1 Each type of chart shall provide information relevant to the function of the chart and its design shall observe Human Factor principles which facilitate its optimum use.

*Note — Human Factors Principles can be found in the Human Factors Training manual (ICAO Document 9683).*

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#### **4.2.9 Abbreviations**

4.2.9.1 Abbreviations shall be used on aeronautical charts whenever they are appropriate.

*Note - Abbreviations should be selected from the Procedures for Air Navigation Services--- ICAO Abbreviations and Codes (ICAO Document 8400).*

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#### **4.2.11 Colors**

4.2.11.1 Colors used on charts should shall conform to Appendix 3 - Color guide of this CAR-ANS.

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#### **4.2.12 Relief**

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4.2.12.2 Where relief is shown by hypsometric tints, the tints should shall be based on those shown in the Hypsometric Tint Guide in Appendix 4 of this CAR-ANS.

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#### **4.2.13 Prohibited, restricted and danger areas**

When prohibited, restricted and danger areas are shown, the reference or other identification shall be included, except that the nationality letters may be omitted.

*Note—The nationality letters are those contained in ICAO Document 7910—Location Indicators.*

#### **4.2.14 Air traffic service airspaces**

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4.2.14.2 On charts used for visual flight, those parts of the ATS Airspace Classification table published in Appendix 11.4 of CAR-ANS Part 11 applicable to the airspace depicted on the chart, should shall be in the face or reverse of each chart.

#### **4.2.15 Magnetic variation**

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~~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.~~

*Note—The date and the annual change may be shown.*

4.2.15.3 For instrument procedure charts, the publication of a magnetic variation change should be completed within a maximum of six AIRAC cycles.

4.2.15.4 In large terminal areas with multiple aerodromes, a single rounded value of magnetic variation should be applied so that the procedures that service multiple aerodromes use a single, common variation value.

#### 4.2.16 Typography

*Note* — Samples of type suitable for use on aeronautical charts are included in *Aeronautical Charts Manual (ICAO Document 8697)*.

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#### 4.2.18 Common reference system

4.2.18.1.1 World Geodetic System -1984 (WGS-84) shall be used as the horizontal (geodetic) reference system. Published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

*Note* — Comprehensive guidance material concerning WGS-84 is contained in the *World Geodetic System—1984 (WGS-84) Manual (ICAO Document 9674)*.

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

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#### 4.3.4 Coverage and scale

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4.3.4.2 The horizontal scale shall be within the range of 1:10,000 to 1:15-20,000.

*Note.*— When the production of the charts would be expedited thereby, a scale of 1:20 000 may be used.

4.3.4.3 The vertical scale should shall be ten times the horizontal scale.

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#### 4.3.5 Format

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4.3.5.3.1 The vertical grid should have intervals of 30 m (100 ft) and the horizontal grid should have intervals of 300 m (1,000 ft).

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#### 4.3.8 Aeronautical data

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4.3.8.4.1.1 The nature of the runway and stopway surfaces should shall be indicated.

4.3.8.4.1.2 Stopways should shall be identified as such and shall be shown by a broken line.

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#### 4.3.9 Accuracy

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4.3.9.2 The horizontal dimensions and the elevations of the runway, stopway and clearway to be printed on the chart should shall be determined to the nearest 0.5 m (1 ft).



4.3.9.3 The order of accuracy of the field work and the precision of chart production ~~should~~ shall be such that measurements in the take-off flight path areas can be taken from the chart within the following maximum deviations:

- a) horizontal distances: 5 m (15 ft) at a point of origin increasing at a rate of 1 per 500;
- b) vertical distances: 0.5 m (1.5 ft) in the first 300 m (1,000 ft) and increasing at a rate of 1 per 1,000.

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#### **4.4 AERODROME OBSTACLE CHART — ICAO TYPE B**

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##### **4.4.2 Availability**

4.4.2.1 When deemed necessary, Aerodrome Obstacle Charts — ICAO Type B ~~should~~ shall be made available, in the manner prescribed in 4.1.3.2, for all aerodromes regularly used by international civil aviation.

*Note: Obstacle Charts – ICAO Type B may be required in accordance with MOS-Aeronautical Charts, 2.3.2*

~~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).~~

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##### **4.4.9 Aeronautical data**

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4.4.9.1.1 The nature of the runway and stopway surfaces ~~should~~ shall be given.

4.4.9.1.2 Wherever practicable, the highest object or obstacle between adjacent approach areas within a radius of 5 000 m (15 000 ft) from the aerodrome reference point ~~should~~ shall be indicated in a prominent manner.

4.4.9.1.3 The extent of tree areas and relief features, part of which constitute obstacles, ~~should~~ shall be shown.

##### **4.4.10 Accuracy**

...

4.4.10.2 The horizontal dimensions and the elevations of the movement area, stopways and clearways to be printed on the chart ~~should~~ shall be determined to the nearest 0.5 m (1 ft).

4.4.10.3 The order or accuracy of the field work and the precision of chart production ~~should~~ shall be such that the resulting data will be within the maximum deviations indicated herein:

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#### **4.5 AERODROME TERRAIN AND OBSTACLE CHART — ICAO (ELECTRONIC)**

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##### **4.5.2 Availability**

4.5.2.1 ~~From 12 November 2015,~~ Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be made available in the manner prescribed in 4.1.3.2 for all aerodromes regularly used by international civil aviation.

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#### 4.5.5 Chart content

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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 terrain data sets which satisfy the requirements of CAR-ANS Part 15, 15.5.

*Note.*— Specifications concerning terrain data sets are contained in *PANS-AIM (Doc 10066) MOS-AIS, Chapter 5 and Appendices 1, 6 and 8.*

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4.5.5.2.3 Representation of terrain surface ~~should~~ shall be provided as a selectable layer of contour lines in addition to the DEM.

4.5.5.2.4 An ortho-rectified image which matches the features on the DEM with features on the overlying image ~~should~~ shall be used to enhance the DEM. The image should be provided as a separate selectable layer.

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4.5.5.2.6 Additional terrain attributes provided in the database(s) ~~should~~ shall be linked to the portrayed terrain feature.

*Note.*— Specifications concerning terrain attributes are contained in *MOS-AIS, Appendix 6, Table A6-1.*

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4.5.5.3.4 Additional obstacle attributes provided in the database(s) ~~should~~ shall be linked to the portrayed obstacle feature.

*Note.*— Specifications concerning obstacle attributes are contained in *MOS-AIS, Appendix 6, Table A6-2.*

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#### 4.5.7 Electronic functionality

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4.5.7.4 When necessary, the chart ~~should~~ shall include its own “reader” software.

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### 4.6 PRECISION APPROACH TERRAIN CHART — ICAO

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#### 4.6.3 Scale

~~4.6.3.1 The horizontal scale should be 1:2,500, and the vertical scale 1:500.~~

~~4.6.3.2 When the chart includes a profile of the terrain to a distance greater than 900 m (3,000 ft) from the runway threshold, the horizontal scale should be 1:5,000.~~

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*Editorial Note: Succeeding provisions will be renumbered.*

#### 4.6.54 Plan and profile information

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4.6.54.2 Where the terrain at a distance greater than 900 m (3 000 ft) from the runway threshold is mountainous or otherwise significant to users of the chart, the profile of the terrain ~~should~~ shall be shown to a distance not exceeding 2 000 m (6 500 ft) from the runway threshold.

4.6.54.3 The ILS reference datum height ~~should~~ shall be shown to the nearest half meter or foot.

## 4.7 ENROUTE CHART — ICAO

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### 4.7.3 Coverage and Scale

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4.7.3.1 Layout of sheet lines ~~should~~ shall be determined by the density and pattern of the ATS route structure.

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### 4.7.4 Projection

4.7.4.1 A conformal projection on which a straight line approximates a great circle ~~should~~ shall be used.

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### 4.7.6 Culture and topography

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4.7.6.2 Within each quadrilateral formed by the parallels and meridians the area minimum altitude shall be shown, except as provided for in 4.7.6.3.

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*Note 2. — Refer to the Procedures for Air Navigation — Aircraft Operations (PANS-OPS, ICAO Document 8168), Volume II, Part I, Section 2, Chapter 1, paragraph 1.8 for method for determination of area minimum altitude.*

### 4.7.7 ~~Magnetic variation~~

4.7.7.1 ~~Isogonals should be indicated and the date of the isogonic information given.~~

*Editorial Note: Succeeding provisions will be renumbered.*

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### 4.7.98 Aeronautical data

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4.7.98.3.1.1 The components shall include the following:

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4) All ATS routes for en-route flight including route designators, the track to the nearest degree in both directions along each segment of the routes and, where established, the designation of the navigation specification(s) including any limitations and the direction of traffic flow;

*Note.— Guidance material on the organization of ATS routes for en-route flight publication which may be used to facilitate charting is contained in the Aeronautical Information Services Manual (ICAO Document 8126).*

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## 4.8 AREA CHART — ICAO

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### 4.8.4 Projection

4.8.4.1 A conformal projection on which a straight line approximates a great circle ~~should~~ shall be used.

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### 4.8.6 Culture and topography

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4.8.6.2 To improve situational awareness in areas where significant relief exists, all relief exceeding 300 m (1 000 ft) above the elevation of the primary aerodrome 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 shall be shown printed in black. Obstacles should shall also be shown.

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#### **4.8.8 Bearings, tracks and radials**

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4.8.8.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

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### **4.9 STANDARD DEPARTURE CHART — INSTRUMENT (SID) — ICAO**

#### **4.9.1 Function**

4.9.1.1 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 enroute phase.

*Note 1.— Provisions governing the identification of standard departure routes are in CAR-ANS Part 11, Appendix 11.3; guidance material relating to the establishment of such routes is contained in the Air Traffic Services Planning Manual (ICAO Document 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, Document 8168), Volume II, Part II.*

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#### **4.9.3 Coverage and Scale**

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4.9.3.2 The chart should shall be drawn to scale.

...

#### **4.9.4 Projection**

...

4.9.4.1 A conformal projection on which a straight line approximates a great circle should shall be used.

4.9.4.2 ~~When the chart is drawn to scale,~~ Pparallels and meridians should shall be shown at suitable intervals.

...

#### **4.9.5 Identification**

4.9.5.1 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 departure route(s) — instrument as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part II, Chapter 5.

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

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#### **4.9.8 Bearings, tracks and radials**

...

4.9.8.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

#### **4.9.9 Aeronautical data**

...

4.9.9.3.2 Where the minimum sector altitude has not been established, the chart shall be drawn to scale and area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians. Area minimum altitudes shall also be shown in those parts of the chart not covered by the minimum sector altitude.

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*Note 2.— Refer to the Procedures for Air Navigation — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part I, Section 2, Chapter 1, paragraph 1.8 for method for determination of area minimum altitude.*

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##### **4.9.9.4.3 Aeronautical database requirements**

Appropriate data to support navigation database coding shall be published in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part III, Section 5, Chapter 2, 2.1, on the verso of the chart or as a separate, properly referenced sheet.

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#### **4.10 STANDARD ARRIVAL CHART — INSTRUMENT (STAR) — ICAO**

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##### **4.10.3 Coverage and Scale**

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4.10.3.2 The chart ~~should~~ shall be drawn to scale.

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##### **4.10.4 Projection**

4.10.4.1 A conformal projection on which a straight line approximates a great circle ~~should~~ shall be used.

4.10.4.2 ~~When the chart is drawn to scale,~~ Parallels and meridians ~~should~~ shall be shown at suitable intervals.

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##### **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) instrument as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS- OPS, Document 8168), Volume II, Part I, Section 4 Chapter 2.

##### **4.10.6 Culture and topography**

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4.10.6.2 To improve situational awareness in areas where significant relief exists, the chart ~~should~~ shall be drawn to scale and all relief exceeding 300 m (1 000 ft) above the aerodrome

elevation shall 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, shall be shown printed in black. Obstacles shall also be shown.

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#### **4.10.8 Bearings, tracks and radials**

...

4.10.8.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

#### **4.10.9 Aeronautical data**

...

4.10.9.3.2 Where the minimum sector altitude has not been established, the chart shall be drawn to scale and area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians. Area minimum altitudes shall also be shown in those parts of the chart not covered by the minimum sector altitude.

...

*Note 2.— Refer to the Procedures for Air Navigation — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part I, Section 2, Chapter 1, paragraph 1.8 for method for determination of area minimum altitude.*

...

#### **4.10.9.4.3 Aeronautical database requirements**

Appropriate data to support navigation database coding shall be published in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part III, Section 5, Chapter 2, 2.2, on the verso of the chart or as a separate, properly referenced sheet.

### **4.11 INSTRUMENT APPROACH CHART — ICAO**

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#### **4.11.3 Coverage and Scale**

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4.11.3.3.2 A distance scale ~~should~~ shall be shown directly below the profile.

#### **4.11.4 Format**

4.11.4.1 The sheet size ~~should~~ shall be 210 x 297 mm (8.27 x 11.69 in).

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#### **4.11.6 Identification**

4.11.6.1 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 instrument approach procedure as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part I, Section 4, Chapter 9.

#### **4.11.7 Culture and topography**

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4.11.7.3 In areas where relief is lower than specified in 4.11.7.2, all relief exceeding 150 m (500 ft) above the aerodrome elevation ~~should~~ shall 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 also be shown printed in black.

...

#### 4.11.9 Bearings, tracks and radials

...

4.11.9.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

#### 4.11.10 Aeronautical data

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4.11.10.2.2 If one or more obstacles are the determining factor of an obstacle clearance altitude/height, those obstacles ~~should~~ shall be identified.

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4.11.10.2.4 The heights of obstacles above a datum other than mean sea level (see 4.11.10.2.3) ~~should~~ shall be shown. ~~When shown, they should be given~~ in parentheses on the chart.

...

4.11.10.4.3 When the final approach fix is used for conventional navigation (or final approach point for an ILS approach procedure), it ~~should~~ shall be identified with its distance (in nautical miles) from the DME.

...

4.11.10.6.2 The plan view ~~should~~ shall show the distance to the aerodrome from each radio navigation aid concerned with the final approach.

...

4.11.10.6.4 Heights required by procedures ~~should~~ shall be shown in parentheses, using the height datum selected in accordance with 4.11.10.2.5.

4.11.10.6.5 The profile view ~~should~~ shall include a ground profile or a minimum altitude/height portrayal as follows:

a) a ground profile shown by a solid line depicting the highest elevations of the relief occurring within the primary area of the final approach segment. The highest elevations of the relief occurring in the secondary areas of the final approach segment shown by a dashed line; or

b) minimum altitudes/heights in the intermediate and final approach segments indicated within bounded shaded blocks.

*Note 1.— For the ground profile portrayal, actual templates of the primary and secondary areas of the final approach segment are provided to the cartographer by the procedures specialist.*

*Note 2.— The minimum altitude/height portrayal is intended for use on charts depicting non-precision approaches with a final approach fix.*

...

4.11.10.8.3 For procedures in which DME is not required for use in the final approach segment but where a suitably located DME is available to provide advisory descent profile information, a table showing the altitudes/ heights ~~should~~ shall be included.

4.11.10.8.4 ~~A rate of descent table shall be shown.~~

4.11.10.8.54 For non-precision approach procedures with a final approach fix, the final approach descent gradient to the nearest one-tenth of a per cent and, in parentheses, descent angle to the nearest one-tenth of a degree shall be shown.

4.11.10.8.65 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.

4.11.10.8.76 When a final approach fix is specified at the final approach point for ILS, a clear indication shall be given whether it applies to the ILS, the associated ILS localizer only procedure, or both. In the case of MLS, a clear indication shall be given when an FAF has been specified at the final approach point.

4.11.10.8.87 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, ICAO Document 8168), Volume II, a cautionary note shall be included.

4.11.10.8.98 A note shall be included on the chart indicating the approach procedures that are authorized for simultaneous independent or dependent operations. The note shall include the runway(s) involved and if they are closely spaced.

#### 4.11.10.9 Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS, Document 8168), Volume II, Part III, Section 5, Chapter 2, 2.3 for RNAV procedures and Volume II, Part I, Section 4, Chapter 9, 9.4.1.3, for non-RNAV procedures, on the verso of the chart or as a separate, properly referenced sheet.

### 4.12 VISUAL APPROACH CHART — ICAO

...

#### 4.12.3 Scale

...

~~4.12.3.2 The scale should not be smaller than 1:500,000.~~

*Note — A scale of 1:250,000 or 1:200,000 is preferred.*

~~4.12.3.3 When an Instrument Approach Chart is available for a given aerodrome, the Visual Approach Chart should be drawn to the same scale.~~

#### 4.12.4 Format

The sheet size ~~should~~ shall be 210 x 297 mm (8.27 x 11.69 in).

It would be advantageous to print the charts in several colors, selected to provide maximum legibility in varying degrees and kinds of light.

...

#### 4.12.7 Culture and topography

...



4.12.7.1.1 Geographical place names ~~should~~ shall be included only when they are required to avoid confusion or ambiguity.

...

4.12.7.4 When shown, spot elevations ~~should~~ shall be carefully selected.

*Note.— The value of certain spot elevations/heights in relation to both mean sea level and aerodrome elevation may be given.*

...

#### **4.12.9 Bearings, tracks and radials**

...

4.12.9.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

#### **4.12.10 Aeronautical data**

...

4.12.10.2.2 The elevation of the top of obstacles ~~should~~ shall be shown to the nearest (next higher) meter or foot.

...

### **4.13 AERODROME/HELIPORT CHART — ICAO**

...

#### **4.13.6 Aerodrome/heliport data**

...

4.13.6.2 For aerodromes accommodating aeroplanes with folding wing tips, the location where the wing tips may be safely extended ~~should~~ shall be shown on the chart.

...

### **4.14 AERODROME GROUND MOVEMENT CHART — ICAO**

...

#### **4.14.2 Availability**

4.14.2.1 Where the detailed information needed for the ground movement of aircraft along taxiways to and from the aircraft stands and the parking and docking of aircraft cannot be shown with sufficient clarity on the Aerodrome/Heliport Chart — ICAO, ~~the Aerodrome Ground Movement Chart — ICAO should~~ shall be made available in the manner prescribed in 4.1.3.2 ~~where, due to congestion of information, details necessary for the ground movement of aircraft along the taxiways to and from the aircraft stands cannot be shown with sufficient clarity on the Aerodrome/Heliport Chart — ICAO.~~

#### **4.14.3 Coverage and Scale.**

...

4.14.3.2 A linear scale ~~should~~ shall be shown.

...

#### **4.14.5 Magnetic variation**

...

4.14.5.2 Magnetic variation to the nearest degree and its annual change ~~should~~ shall be shown.

*Note.— This chart need not be True North orientated.*

#### **4.14.6 Aerodrome data**

...

4.14.6.2 For aerodromes accommodating aeroplanes with folding wing tips, the location where the wing tips may be safely extended ~~should~~ shall be shown on the chart.

#### **4.15 AIRCRAFT PARKING/DOCKING CHART — ICAO**

...

##### **4.15.2 Availability**

4.15.2.1 Where, due to the complexity of the terminal facilities, the information cannot be shown with sufficient clarity on the Aerodrome/Heliport Chart — ICAO or on the Aerodrome Ground Movement Chart — ICAO, ~~the Aircraft Parking/ Docking Chart — ICAO should~~ shall be made available in the manner prescribed in 4.1.3.2 ~~where, due to the complexity of the terminal facilities, the information cannot be shown with sufficient clarity on the Aerodrome/Heliport Chart — ICAO or on the Aerodrome Ground Movement Chart — ICAO.~~

##### **4.15.3 Coverage and Scale**

...

4.15.3.2 A linear scale ~~should~~ shall be shown.

...

##### **4.15.5 Magnetic variation**

...

4.15.5.2 Magnetic variation to the nearest degree and its annual change ~~should~~ shall be shown.

*Note.— This chart need not be True North orientated.*

...

#### **4.16 WORLD AERONAUTICAL CHART — ICAO 1:1 000 000**

...

##### **4.16.2 Availability**

...

4.16.2.2 To ensure complete coverage of all land areas and adequate continuity in any one coordinated series, the selection of a scale of other than 1:1 000 000 ~~should~~ shall be determined by regional agreement.

##### **4.16.3 Scale**

...

4.16.3.1.1 The length of the linear scales ~~should~~ shall represent at least 200 km (110NM).

...

##### **4.16.4 Format**

...

4.16.4.3 The method of folding ~~should~~ shall be as follows:

Fold the chart on the long axis, near the mid-parallel of latitude, face out; with the bottom half of the chart face upward, fold inwards near the meridian, and fold both halves backward in accordion folds.

4.16.4.4 Whenever practicable, the sheet lines ~~should~~ shall conform with those shown in the index in Appendix 5.

*Note.— The area covered by a sheet may vary from the lines shown to satisfy particular requirements.*

*Note.— The value of adopting identical sheet lines for ICAO 1:1 000 000 Charts and the corresponding sheet of the International Map of the World (IMW), provided aeronautical requirements are not compromised, is recognized.*

4.16.4.5 Overlaps ~~should~~ shall be provided by extending the chart area on the top and right side beyond the area given on the index. This overlap area shall contain all aeronautical, topographical, hydrographical and cultural information. The overlap should extend up to 28 km (15 NM), if possible, but in any case from the limiting parallels and meridians of each chart to the neat line.

#### **4.16.5 Projection**

...

4.16.5.3.1 The length of the graduation marks ~~should~~ shall be approximately 1.3 mm (0.05 in) for the 1' intervals, and 2 mm (0.08 in) for the 5' intervals and 2 mm (0.08 in) extending on both sides of the graticule line for the 10' intervals.

...

#### **4.16.7 Culture and topography**

...

4.16.7.1.2 Cities and towns of sufficient size ~~should~~ shall be indicated by the outline of their built-up areas and not of their established city limits.

...

4.16.7.2.2 Important tunnels ~~should~~ shall be shown.

*Note.— A descriptive note may be added.*

...

4.16.7.3.2 Roads ~~should~~ shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.

*Note.— The numbers or names of important highways may be shown.*

...

4.16.7.4.1 Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, forts, ruins, levees, pipelines, and rocks, bluffs, cliffs, sand dunes, isolated lighthouses, lightships, etc., when considered to be of importance for visual air navigation, ~~should~~ shall be shown.

*Note.— Descriptive notes may be added.*

...

4.16.7.6.2 The tint covering large open water areas ~~should~~ shall be kept very light.

*Note.— A narrow band of darker tone may be used along the shore line to emphasize this feature.*

4.16.7.6.3 Reefs and shoals including rocky ledges, tidal flats, isolated rocks, sand, gravel, stone and all similar areas ~~should~~ shall be shown by symbols when of significant landmark value.

*Note.— Groups of rocks may be shown by a few representative rock symbols within the area.*

...

4.16.7.9.3 The spot elevation of the highest point in any sheet ~~should~~ shall be cleared of hypsometric tinting.

...

4.16.7.11.1 Escarpments ~~should~~ shall be shown when they are prominent landmarks or when cultural detail is very sparse.

...

4.16.7.12.1 Wooded areas ~~should~~ shall be shown.

*Note.*— *On high latitude charts, the approximate extreme northern or southern limits of tree growth may be shown.*

...

## **4.17 AERONAUTICAL CHART — ICAO 1:500 000**

...

### **4.17.2 Availability**

4.17.2.1 The *Aeronautical Chart - ICAO 1:500 000* shall be made available in the manner prescribed in 4.1.3.2 for all areas delineated in Appendix 5, when operational requirement for visual navigation or chart production considerations indicates a need for this chart either as a substitute for or to supplement the World Aeronautical Chart - ICAO 1:1 000 000. ~~The Aeronautical Chart — ICAO 1:500 000 should be made available in the manner prescribed in 4.1.3.2 for all areas delineated in Appendix 5.~~

*Note.*— *The selection of this scale as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000 is covered by 4.16.2.1 and 4.16.2.2.*

### **4.17.3 Scales**

...

4.17.3.1.1 The length of the linear scale ~~should~~ shall be not less than 200 mm (8 in).

...

### **4.17.4 Format**

...

4.17.4.3 The method of folding ~~should~~ shall be as follows:

Fold the chart on the long axis near the mid-parallel of latitude, face out, with the bottom part of the chart face upward. Fold inwards near the meridian and fold both halves backward in accordion folds.

4.17.4.4 Whenever practicable, sheets ~~should~~ shall be quarter sheets of the World Aeronautical Chart — ICAO 1:1 000 000. An appropriate index to adjacent sheets, showing the relationship between the two chart series shall be included on the face of the chart or on the reverse side.

*Note.*— *Sheet lines may be varied to satisfy particular requirements.*

4.17.4.5 Overlaps ~~should~~ shall be provided by extending the chart area on the top and right side beyond the area given on the index. This overlap area should contain all aeronautical, topographical, hydrographical and cultural information. The overlap should extend up to 15 km (8 NM), if possible, but in any case from the limiting parallels and meridians of each chart to the neat line.

### **4.17.5 Projection**

...

4.17.5.2 The projection of the World Aeronautical Chart — ICAO 1:1 000 000 ~~should~~ shall be used.

...

4.17.5.4.1 The length of the graduation marks ~~should~~ shall be approximately 1.3 mm (0.05 in) for the 1' intervals, and 2 mm (0.08 in) for the 5' intervals and 2 mm (0.08 in) extending on both sides of the graticule line for the 10' intervals.

...

4.17.5.5.1 Each meridian and parallel ~~should~~ shall be numbered within the body of the chart whenever this data is required operationally.

...

#### 4.17.6 Identification

...

4.17.6.1.1 Where applicable, sheets ~~should~~ shall also be identified by the reference number of the corresponding World Aeronautical Chart — ICAO 1:1 000 000, with the addition of one or more of the following letter suffixes indicating the quadrant or quadrants:

...

#### 4.17.7 Culture and topography

...

4.17.7.1.2 Cities and towns of sufficient size ~~should~~ shall be shown by the outline of their built-up areas and not of their established city limits.

...

4.17.7.3.2 Roads ~~should~~ shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.

*Note.— The numbers or names of important highways may be shown.*

...

4.17.7.4.1 Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, lookout towers, forts, ruins, levees, pipelines, rocks, bluffs, cliffs, sand dunes, isolated lighthouses and lightships, when considered to be of importance for visual air navigation, ~~should~~ shall be shown.

*Note.— Descriptive notes may be added.*

...

4.17.7.6.2 The tint covering large open water areas ~~should~~ shall be kept very light.

*Note.— A narrow band of darker tone may be used along the shore line to emphasize this feature.*

4.17.7.6.3 Reefs and shoals, including rocky ledges, tidal flats, isolated rocks, sand, gravel, stone and all similar areas ~~should~~ shall be shown by symbols when of significant landmark value.

*Note.— Groups of rocks may be shown by a few representative rock symbols within the area.*

...

4.17.7.9.3 The spot elevation of the highest point on any sheet ~~should~~ shall be cleared of hypsometric tinting.

...

4.17.7.11.1 Escarpments ~~should~~ shall be shown when they are prominent landmarks or when cultural detail is very sparse.

...

4.17.7.12.1 Wooded areas ~~should~~ shall be shown.

*Note.*— *On high latitude charts the approximate extreme northern or southern limits of tree growth may be shown.*

...

## **4.18 AERONAUTICAL NAVIGATION CHART — ICAO SMALL SCALE**

...

### **4.18.2 Availability**

4.18.2.1 The Aeronautical Navigation Chart — ICAO Small Scale ~~should~~ shall be made available in the manner prescribed in 4.1.3.2 for all areas delineated in Appendix 5, when operational requirement for visual navigation or chart production considerations indicates a need for this chart either as a substitute for or to supplement the World Aeronautical Chart - ICAO 1:1 000 000.

*Note.*— *The selection of this scale as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000 is covered by 4.16.2.1 and 4.16.2.2.*

### **4.18.3 Coverage and scale**

4.18.3.1 The Aeronautical Navigation Chart — ICAO Small Scale ~~should~~ shall provide, as a minimum, complete coverage of the major land masses of the world.

*Note 1.*— *A sheet layout for this series is contained in the Aeronautical Chart Manual (ICAO Document 8697).*

*Note 2.*— *The sheet size may represent the maximum press size available to the producing agency.*

...

4.18.3.5 The length of the linear scale ~~should~~ shall be not less than 200 mm (8 in).

...

### **4.18.6 Culture and topography**

...

4.18.6.1.2 Cities and towns of sufficient size ~~should~~ shall be indicated by the outline of their built-up areas and not of their established city limits.

...

4.18.6.2.2 Important tunnels ~~should~~ shall be shown.

*Note.*— *A descriptive note may be added.*

...

4.18.6.3.2 Roads ~~should~~ shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.

#### **4.18.6.4 Landmarks**

Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, mine structures, forts, ruins, levees, pipelines and rocks, bluffs, cliffs, sand dunes, isolated lighthouses and lightships, when considered to be of importance for visual air navigation, ~~should~~ shall be shown.

*Note.— Descriptive notes may be added.*

...

4.18.6.6.2 The tint covering large open water areas ~~should~~ shall be kept very light.

*Note.— A narrow band of darker tone may be used along the shore line to emphasize this feature.*

...

4.18.6.6.3 Reefs and shoals including rocky ledges, tidal flats, isolated rocks, sand, gravel, stone and all similar areas ~~should~~ shall be shown by symbols when of significant landmark value.

...

4.18.6.9.3 The spot elevation of the highest point in any sheet ~~should~~ shall be cleared of hypsometric tinting.

...

4.18.6.11.1 Escarpments ~~should~~ shall be shown when they are prominent landmarks or when cultural detail is very sparse.

...

4.18.6.12.1 Wooded areas of large extent ~~should~~ shall be shown.

...

4.18.6.14.1 Subdued colors ~~should~~ shall be used for the chart background to facilitate plotting.

4.18.6.14.2 Good color contrast ~~should~~ shall be ensured to emphasize features important to visual air navigation.

...

4.18.8.3.1 Prohibited, restricted and danger areas ~~should~~ shall be shown when considered to be of importance to air navigation.

...

4.18.8.4.1 Significant elements of the air traffic services system ~~should~~ shall be shown when considered to be of importance to air navigation.

4.18.8.4.2 Where appropriate, the air defense identification zone (ADIZ) ~~should~~ shall be shown and properly identified.

*Note.— ADIZ procedures may be described in the chart legend.*

...

## **4.19 Plotting Chart – ICAO**

...

### **4.19.2 Availability**

4.19.2.1 When deemed necessary, This Plotting Chart - ICAO ~~chart~~ ~~should~~ shall be made available, in the manner prescribed in 4.1.3.2, to cover major air routes over oceanic areas and sparsely settled areas used by international civil aviation.

*Note. 1: — In areas where the Enroute Chart — ICAO is provided there may be no requirement for a plotting chart.*

*Note. 2: — Plotting Chart may be required in accordance with MOS-Aeronautical Charts, 2.3.6.*

### 4.19.3 Coverage and scale

4.19.3.1 Where practicable, the chart for a particular region ~~should~~ shall cover major air routes and their terminals on a single sheet.

4.19.3.2 The scale ~~should~~ shall be governed by the area to be covered.

*Note.*— Normally, the scale will range from 1:3 000 000 to 1:7 500 000.

### 4.19.4 Format

4.19.4.1 The sheet ~~should~~ shall be of a size that can be adapted for use on a navigator's plotting table.

### 4.19.5 Projection

4.19.5.1 A conformal projection on which a straight line approximates a great circle ~~should~~ shall be used.

...

4.19.5.2.1 The intervals ~~should~~ shall be arranged to permit accurate plotting to be carried out with a minimum of time and effort.

...

4.19.5.2.3 Parallels and meridians ~~should~~ shall be numbered so that a number appears at least once every 15 cm (6 in) on the face of the chart.

...

### 4.19.7 Culture and topography

...

4.19.7.3 Particularly hazardous or prominent relief features ~~should~~ shall be emphasized.

*Note.*— Large cities and towns may be shown.

...

### 4.19.9 Aeronautical data

...

4.19.9.2 Aeronautical ground lights and marine lights useful for air navigation ~~should~~ shall be shown where other means of navigation are non-existent.

...

## 4.21 ATC SURVEILLANCE MINIMUM ALTITUDE CHART — ICAO

...

### 4.21.2 Availability

4.21.2.1 The ATC Surveillance Minimum Altitude Chart — ICAO ~~should~~ shall be made available, in the manner prescribed in 4.1.3.2, where radar vectoring procedures are established and radar minimum altitudes cannot be shown adequately on the Area Chart — ICAO, Standard Departure Chart — Instrument (SID) — ICAO or Standard Arrival Chart — Instrument (STAR) — ICAO.

### 4.21.3 Coverage and scale

...



~~4.21.3.3 The chart should be drawn to the same scale as the associated Area Chart — ICAO.~~

#### **4.21.4 Projection**

~~4.21.4.1 A conformal projection on which a straight line approximates a geodesic line should shall be used.~~

~~4.21.4.2 Graduation marks should shall be placed at consistent intervals along the neat lines, as appropriate.~~

...

#### **4.21.8 Bearings, tracks and radials**

...

~~4.21.8.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.~~

#### **4.21.9 Aeronautical data**

...

~~4.21.9.3.2 A textual description of communication failure procedures in relation to radar control should be provided and should shall, whenever feasible, be shown on the chart or on the same page that contains the chart.~~

### **4.22 REPEALING PROVISIONS**

~~All previous CAR-ANS, Memorandum Circulars or part thereof as they pertain to aeronautical charts which are inconsistent with the provisions of this Civil Aviation Regulations Air Navigation Services Part 4 (CAR-ANS Part 4) are hereby repealed, amended or modified accordingly.~~

### **4.23 SEPARABILITY PROVISIONS**

~~The provisions of this Civil Aviation Regulations Air Navigation Services Part 4 (CAR-ANS Part 4) are hereby declared separable. If any portion thereof shall be held invalid or unconstitutional, such invalidity or unconstitutionality shall not affect the other provisions which shall be in full force and effect.~~

### **4.24 DISTRIBUTION**

~~This Civil Aviation Regulations Air Navigation Services Part 4 (CAR-ANS Part 4) shall be distributed to all air traffic services facilities involved in the flight procedures design, publication of aeronautical charts, and those engaged in flight operations.~~

...

— END —

### **NEW/AMENDED REGULATION AFTER REVISION:**

## **CIVIL AVIATION REGULATIONS – AIR NAVIGATION SERVICES PART 4**

...

### **FOREWORD**

Pursuant to the provisions of Article 37 and Article 25 of the convention of International Civil Aviation, the Civil Aviation Authority of the Philippines (CAAP) formulated and issued this Civil Aviation Regulations-Air Navigation Services Part 4 (CAR-ANS Part 4), establishing rules and regulations relating to Aeronautical Charts.

This CAR-ANS Part 4 was also developed based on the Standards and Recommended Practices prescribed by the International Civil Aviation Organization (ICAO) as contained in Annex 4 – Aeronautical Charts.

CAR-ANS Part 4 provides the requirements for Aeronautical Charts service providers in order to ensure the production and availability of Aeronautical Charts for the safety, regularity and efficiency of international air navigation.

...

## **I. PURPOSE**

This Civil Aviation Regulation provides the rules and regulations in governing the provisions of aeronautical charts in the Philippines.

## **II. AUTHORITY**

The regulations contained herein are issued by authority of the Director General of CAAP by the virtue of Board Resolution No. 2012-054 and shall be complied with by all concerned.

## **III. APPLICABILITY**

The rules and regulations herein prescribed shall apply to the planning, charting, editing production, maintenance/review and classification of aeronautical charts for both governmental and non-governmental charting agencies.

## **IV. REPEALING PROVISIONS**

All previous Administrative Orders, Memorandum Circulars or part thereof as they pertain to aeronautical charts which are inconsistent with the provisions of this Civil Aviation Regulations are hereby repealed, amended or modified accordingly.

## **V. SEPARABILITY PROVISIONS**

The provisions of this Civil Aviation Regulations are hereby declared separable. If any portion thereof shall be held invalid or unconstitutional, such invalidity or unconstitutionality shall not affect the other provisions which shall be in full force and effect.

## **VI. DISTRIBUTION**

This Civil Aviation Regulation will be distributed to all service providers involved in the flight procedures design, production or publication of aeronautical charts, air traffic services facilities and organizations involved in flight operations.

...

### **4.1 DEFINITIONS**

#### **4.1.1 DEFINITIONS**

...

**Navigation specification.** A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

...

**Area navigation (RNAV) specification.** A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

...

*Note 2.— The term RNP, previously defined as “a statement of the navigation performance necessary for operation within a defined airspace”, has been removed from this CAR-ANS as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this CAR-ANS is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in ICAO Document 9613.*

**Obstacle.** All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight.

*Note.— The term obstacle is used in this CAR-ANS solely for the purpose of specifying the charting of objects that are considered a potential hazard to the safe passage of aircraft in the type of operation for which the individual chart series is designed.*

...

#### 4.1.2 ABBREVIATIONS

<b>ADA</b>	Advisory airspace
<b>ADR</b>	Advisory route
<b>ADIZ</b>	Air Defense Identification Zone
<b>AIRAC</b>	Aeronautical Information Regulation and Control
<b>AIP</b>	Aeronautical Information Publication
<b>AMA</b>	Area Minimum Altitude
<b>ATS</b>	Air Traffic Service
<b>ATZ</b>	Aerodrome Traffic Zone
<b>AWY</b>	Airway
<b>CAAP</b>	Civil Aviation Authority of the Philippines
<b>CAR-ANS</b>	Civil Aviation Regulations – Air Navigation Service
<b>COP</b>	Change-over Point
<b>CRC</b>	Cyclic Redundancy Check
<b>CTA</b>	Control Area
<b>CWY</b>	Clearway
<b>DEM</b>	Digital Elevation Model
<b>DME</b>	Distance Measuring Equipment
<b>FAF</b>	Final Approach Fix
<b>FAP</b>	Final Approach Point
<b>FATO</b>	Final Approach and Take-off Area

<b>FIR</b>	Flight Information Region
<b>HCH</b>	Heliport Crossing Height
<b>HRP</b>	Heliport Reference Point
<b>IAF</b>	Initial Approach Fix
<b>ICAO</b>	International Civil Aviation Organization
<b>ILS</b>	Instrument Landing System
<b>IMW</b>	International Map of the World
<b>ISO</b>	International Organization for Standardization
<b>MEA</b>	Minimum En-route Altitude
<b>MOCA</b>	Minimum Obstacle Clearance Altitude
<b>MOS</b>	Manual of Standards
<b>MOS-AIS</b>	Manual of Standards – Aeronautical Information Service
<b>MRP</b>	MET Reporting Point
<b>MSA</b>	Minimum Sector Altitude
<b>MSL</b>	Mean Sea Level
<b>MAPt</b>	Missed Approach Point
<b>NDB</b>	Non-directional Radio Beacon
<b>OCA</b>	Obstacle Clearance Altitude
<b>OCH</b>	Obstacle Clearance Height
<b>OFZ</b>	Obstacle Free Zone
<b>PCAR</b>	Philippine Civil Aviation Regulations
<b>PBN</b>	Performance-based Navigation
<b>RNAV</b>	Area Navigation
<b>RVR</b>	Runway Visual Range
<b>SATVOICE</b>	Satellite Voice Communications
<b>SID</b>	Standard Departure Chart — Instrument
<b>STAR</b>	Standard Arrival Chart — Instrument
<b>SWY</b>	Stopway
<b>TAA</b>	Terminal Arrival Altitude
<b>TLOF</b>	Touchdown and Lift-off Area
<b>UTC</b>	Coordinated Universal Time
<b>VFR</b>	Visual Flight Rules
<b>VOR</b>	<i>VHF</i> Omnidirectional Range
<b>WGS-84</b>	World Geodetic System -1984

#### 4.1.3 AVAILABILITY

...

4.1.3.2.2 For any chart or single sheet of a chart series which includes the territory of two or more Contracting States, the States having jurisdiction over the territory so included shall determine the manner in which the chart or sheet will be made available. This determination shall be made with due regard being given to regional air navigation agreements and to any program of allocation established by the Council of ICAO.

*Note.— The phrase “regional air navigation agreements” refers to the agreements approved by the Council of ICAO normally on the advice of regional air navigation meetings.*

4.1.3.3 CAAP shall take all reasonable measures to ensure that the information it provides and the aeronautical charts made available are adequate and accurate and that they are maintained up to date by an adequate revision service.

4.1.3.4 To improve worldwide dissemination of information on new charting techniques and production methods, appropriate charts produced by CAAP shall be made available without charge to other Contracting States on request on a reciprocal basis.

*Note.— Guidance material on the preparation of aeronautical charts, including sample formats, is contained in the Aeronautical Chart Manual ICAO Document 8697.*

#### **4.1.4 RULES OF CONSTRUCTION**

##### **Terminology**

Through this regulation the following word usage applies:

- a) **Shall** indicates a mandatory requirement.
- b) **May** indicates that discretion can be used when performing an act described in a regulation.
- c) **Will** indicates an action incumbent upon the Authority.

#### **4.1.5 AMENDMENT/REVISION TO CAR-ANS PART 4**

Proposals for any amendment or revision to CAR-ANS Part 4 shall be submitted to the Technical Working Group (TWG) of the Air Traffic Management Safety Inspectorate Division (ATMSID). Whether it is an ICAO Annex 4 adopted amendment or any amendment or revision initiated by CAAP or by any other aviation stakeholders, the ATMSID TWG shall submit the deliberated proposal to the Regulations Review Committee (RRC) for furtherance.

The Chairman of the RRC shall be the Director General or his authorized representative and the Vice Chairman for CAR -ANS Part 4 related matters shall be the Chief of AANSOO. The Secretariat of the RRC on matters concerning CAR-ANS Part 4 shall be the current Chief of the Regulatory Safety Standards Division (RSSD) of AANSOO.

The RRC shall follow the procedures prescribed in the Regulations Amendment/ Revision Procedure (RAP) in deciding on the amendment or revision to or any other proposals associated with it. Once the amendment or revision is reviewed and endorsed by the RRC for the approval of the Director General, it shall have to be published in the Official Gazette of the Philippines or in a newspaper of general circulation. A copy of this published amendment/revision to regulations must be filed to the University of the Philippines Law Center - Office of the National Administrative Register (UP-ONAR).

The Chairman of the RRC shall convene the committee during regular meetings or at the instance of the Chairman or Vice-Chairmen and follow the Internal Rules of Procedures prescribed in the RAP.

## **4.2 GENERAL SPECIFICATIONS**

### **4.2.1 Operational Requirements for Charts**

...

4.2.1.1 Each type of chart shall provide information relevant to the function of the chart and its design shall observe Human Factor principles which facilitate its optimum use.

*Note — Human Factors Principles can be found in the Human Factors Training manual (ICAO Document 9683).*

...

### **4.2.9 Abbreviations**

4.2.9.1 Abbreviations shall be used on aeronautical charts whenever they are appropriate.

*Note - Abbreviations should be selected from the Procedures for Air Navigation Services--- ICAO Abbreviations and Codes (ICAO Document 8400).*

...

### **4.2.11 Colors**

4.2.11.1 Colors used on charts shall conform to Appendix 3 - Color guide of this CAR-ANS.

...

### **4.2.12 Relief**

...

4.2.12.2 Where relief is shown by hypsometric tints, the tints shall be based on those shown in the Hypsometric Tint Guide in Appendix 4 of this CAR-ANS.

...

### **4.2.13 Prohibited, restricted and danger areas**

When prohibited, restricted and danger areas are shown, the reference or other identification shall be included, except that the nationality letters may be omitted.

*Note—The nationality letters are those contained in ICAO Document 7910—Location Indicators.*

### **4.2.14 Air traffic service airspaces**

...

4.2.14.2 On charts used for visual flight, those parts of the ATS Airspace Classification table published in Appendix 11.4 of CAR-ANS Part 11 applicable to the airspace depicted on the chart, shall be in the face or reverse of each chart.

...

### **4.2.16 Typography**

*Note —Samples of type suitable for use on aeronautical charts are included in Aeronautical Charts Manual (ICAO Document 8697).*

...

### **4.2.18 Common reference system**

4.2.18.1.1 World Geodetic System -1984 (WGS-84) shall be used as the horizontal (geodetic) reference system. Published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

*Note — Comprehensive guidance material concerning WGS-84 is contained in the World Geodetic System—1984 (WGS-84) Manual (ICAO Document 9674).*

...

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

...

#### **4.3.4 Coverage and scale**

...

4.3.4.2 The horizontal scale shall be within the range of 1:10,000 to 1:20,000.

*Note.— When the production of the charts would be expedited thereby, a scale of 1:20 000 may be used.*

4.3.4.3 The vertical scale shall be ten times the horizontal scale.

...

#### **4.3.8 Aeronautical data**

...

4.3.8.4.1.1 The nature of the runway and stopway surfaces shall be indicated.

4.3.8.4.1.2 Stopways shall be identified as such and shall be shown by a broken line.

...

#### **4.3.9 Accuracy**

...

4.3.9.2 The horizontal dimensions and the elevations of the runway, stopway and clearway to be printed on the chart shall be determined to the nearest 0.5 m (1 ft).

4.3.9.3 The order of accuracy of the field work and the precision of chart production shall be such that measurements in the take-off flight path areas can be taken from the chart within the following maximum deviations:

a) horizontal distances: 5 m (15 ft) at a point of origin increasing at a rate of 1 per 500;

b) vertical distances: 0.5 m (1.5 ft) in the first 300 m (1,000 ft) and increasing at a rate of 1 per 1,000.

...

### **4.4 AERODROME OBSTACLE CHART — ICAO TYPE B**

...

#### **4.4.2 Availability**

4.4.2.1 When deemed necessary, Aerodrome Obstacle Charts — ICAO Type B shall be made available in the manner prescribed in 4.1.3.2, for all aerodromes regularly used by international civil aviation.

*Note: Obstacle Charts — ICAO Type B may be required in accordance with MOS-Aeronautical Charts, 2.3.2*

...

#### **4.4.9 Aeronautical data**

...

4.4.9.1.1 The nature of the runway and stopway surfaces shall be given.

4.4.9.1.2 Wherever practicable, the highest object or obstacle between adjacent approach areas within a radius of 5 000 m (15 000 ft) from the aerodrome reference point shall be indicated in a prominent manner.

4.4.9.1.3 The extent of tree areas and relief features, part of which constitute obstacles, shall be shown.

#### **4.4.10 Accuracy**

...

4.4.10.2 The horizontal dimensions and the elevations of the movement area, stopways and clearways to be printed on the chart shall be determined to the nearest 0.5 m (1 ft).

4.4.10.3 The order or accuracy of the field work and the precision of chart production shall be such that the resulting data will be within the maximum deviations indicated herein:

...

### **4.5 AERODROME TERRAIN AND OBSTACLE CHART — ICAO (ELECTRONIC)**

...

#### **4.5.2 Availability**

4.5.2.1 Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be made available in the manner prescribed in 4.1.3.2 for all aerodromes regularly used by international civil aviation.

...

#### **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 terrain data sets which satisfy the requirements of CAR-ANS Part 15, 15.5.

*Note.— Specifications concerning terrain data sets are contained in MOS-AIS, Chapter 5 and Appendices 1, 6 and 8.*

...

4.5.5.2.3 Representation of terrain surface shall be provided as a selectable layer of contour lines in addition to the DEM.

4.5.5.2.4 An ortho-rectified image which matches the features on the DEM with features on the overlying image shall be used to enhance the DEM. The image should be provided as a separate selectable layer.

...

4.5.5.2.6 Additional terrain attributes provided in the database(s) shall be linked to the portrayed terrain feature.

*Note — Specifications concerning terrain attributes are contained in MOS-AIS, Appendix 6, Table A6-1.*

...

4.5.5.3.4 Additional obstacle attributes provided in the database(s) shall be linked to the portrayed obstacle feature.

*Note.— Specifications concerning obstacle attributes are contained in MOS-AIS, Appendix 6, Table A6-2.*



...

#### **4.5.7 Electronic functionality**

...

4.5.7.4 When necessary, the chart shall include its own “reader” software.

...

### **4.6 PRECISION APPROACH TERRAIN CHART — ICAO**

...

*Editorial Note: Succeeding provisions will be renumbered.*

#### **4.6.4 Plan and profile information**

...

4.6.4.2 Where the terrain at a distance greater than 900 m (3 000 ft) from the runway threshold is mountainous or otherwise significant to users of the chart, the profile of the terrain shall be shown to a distance not exceeding 2 000 m (6 500 ft) from the runway threshold.

4.6.4.3 The ILS reference datum height shall be shown to the nearest half meter or foot.

### **4.7 ENROUTE CHART — ICAO**

...

#### **4.7.3 Coverage and Scale**

...

4.7.3.1 Layout of sheet lines shall be determined by the density and pattern of the ATS route structure.

...

#### **4.7.4 Projection**

4.7.4.1 A conformal projection on which a straight line approximates a great circle shall be used.

...

#### **4.7.6 Culture and topography**

...

4.7.6.2 Within each quadrilateral formed by the parallels and meridians the area minimum altitude shall be shown, except as provided for in 4.7.6.3.

...

*Note 2. — Refer to the Procedures for Air Navigation — Aircraft Operations (PANS-OPS, ICAO Document 8168), Volume II, Part I, Section 2, Chapter 1, paragraph 1.8 for method for determination of area minimum altitude.*

...

#### **4.7.8 Aeronautical data**

...

4.7.8.3.1.1 The components shall include the following:

...

4) All ATS routes for en-route flight including route designators, the track to the nearest degree in both directions along each segment of the routes and, where established, the designation of the navigation specification(s) including any limitations and the direction of traffic flow;

*Note.— Guidance material on the organization of ATS routes for en-route flight publication which may be used to facilitate charting is contained in the Aeronautical Information Services Manual (ICAO Document 8126).*

...

### **4.8 AREA CHART — ICAO**

...

#### **4.8.4 Projection**

4.8.4.1 A conformal projection on which a straight line approximates a great circle shall be used.

...

#### **4.8.6 Culture and topography**

...

4.8.6.2 To improve situational awareness in areas where significant relief exists, all relief exceeding 300 m (1 000 ft) above the elevation of the primary aerodrome 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, shall be shown printed in black. Obstacles shall also be shown.

...

#### **4.8.8 Bearings, tracks and radials**

...

4.8.8.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

...

### **4.9 STANDARD DEPARTURE CHART — INSTRUMENT (SID) — ICAO**

#### **4.9.1 Function**

4.9.1.1 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 enroute phase.

*Note 1.— Provisions governing the identification of standard departure routes are in CAR-ANS Part 11, Appendix 11.3; guidance material relating to the establishment of such routes is contained in the Air Traffic Services Planning Manual (ICAO Document 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, Document 8168), Volume II, Part II.*

...

#### **4.9.3 Coverage and Scale**

...

4.9.3.2 The chart shall be drawn to scale.

...

#### **4.9.4 Projection**

...

4.9.4.1 A conformal projection on which a straight line approximates a great circle shall be used.

4.9.4.2 Parallels and meridians shall be shown at suitable intervals.

...

#### **4.9.5 Identification**

4.9.5.1 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 departure

route(s) — instrument as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part II, Chapter 5.

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

...

#### **4.9.8 Bearings, tracks and radials**

...

4.9.8.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

#### **4.9.9 Aeronautical data**

...

4.9.9.3.2 Where the minimum sector altitude has not been established, the chart shall be drawn to scale and area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians. Area minimum altitudes shall also be shown in those parts of the chart not covered by the minimum sector altitude.

...

*Note 2.*— *Refer to the Procedures for Air Navigation — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part I, Section 2, Chapter 1, paragraph 1.8 for method for determination of area minimum altitude.*

...

#### **4.9.9.4.3 Aeronautical database requirements**

Appropriate data to support navigation database coding shall be published in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part III, Section 5, Chapter 2, 2.1, on the verso of the chart or as a separate, properly referenced sheet.

...

### **4.10 STANDARD ARRIVAL CHART — INSTRUMENT (STAR) — ICAO**

...

#### **4.10.3 Coverage and Scale**

...

4.10.3.2 The chart shall be drawn to scale.

...

#### **4.10.4 Projection**

4.10.4.1 A conformal projection on which a straight line approximates a great circle shall be used.

4.10.4.2 Parallels and meridians shall be shown at suitable intervals.

...

#### **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) instrument as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS- OPS, Document 8168), Volume II, Part I, Section 4 Chapter 2.

#### **4.10.6 Culture and topography**

...

4.10.6.2 To improve situational awareness in areas where significant relief exists, the chart shall be drawn to scale and all relief exceeding 300 m (1 000 ft) above the aerodrome elevation shall 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, shall be shown printed in black. Obstacles shall also be shown.

...

#### **4.10.8 Bearings, tracks and radials**

...

4.10.8.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

#### **4.10.9 Aeronautical data**

...

4.10.9.3.2 Where the minimum sector altitude has not been established, the chart shall be drawn to scale and area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians. Area minimum altitudes shall also be shown in those parts of the chart not covered by the minimum sector altitude.

...

*Note 2.— Refer to the Procedures for Air Navigation — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part I, Section 2, Chapter 1, paragraph 1.8 for method for determination of area minimum altitude.*

...

#### **4.10.9.4.3 Aeronautical database requirements**

Appropriate data to support navigation database coding shall be published in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part III, Section 5, Chapter 2, 2.2, on the verso of the chart or as a separate, properly referenced sheet.

### **4.11 INSTRUMENT APPROACH CHART — ICAO**

...

#### **4.11.3 Coverage and Scale**

...

4.11.3.3.2 A distance scale shall be shown directly below the profile.

#### **4.11.4 Format**

4.11.4.1 The sheet size shall be 210 x 297 mm (8.27 x 11.69 in).

...

#### **4.11.6 Identification**

4.11.6.1 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 instrument approach procedure as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Document 8168), Volume II, Part I, Section 4, Chapter 9.

#### **4.11.7 Culture and topography**

...

4.11.7.3 In areas where relief is lower than specified in 4.11.7.2, all relief exceeding 150 m (500 ft) above the aerodrome elevation shall 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 also be shown printed in black.

...

#### **4.11.9 Bearings, tracks and radials**

...

4.11.9.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

#### **4.11.10 Aeronautical data**

...

4.11.10.2.2 If one or more obstacles are the determining factor of an obstacle clearance altitude/height, those obstacles shall be identified.

...

4.11.10.2.4 The heights of obstacles above a datum other than mean sea level (see 4.11.10.2.3) shall be shown in parentheses on the chart.

...

4.11.10.4.3 When the final approach fix is used for conventional navigation (or final approach point for an ILS approach procedure), it shall be identified with its distance (in nautical miles) from the DME.

...

4.11.10.6.2 The plan view shall show the distance to the aerodrome from each radio navigation aid concerned with the final approach.

...

4.11.10.6.4 Heights required by procedures shall be shown in parentheses, using the height datum selected in accordance with 4.11.10.2.5.

4.11.10.6.5 The profile view shall include a ground profile or a minimum altitude/height portrayal as follows:

a) a ground profile shown by a solid line depicting the highest elevations of the relief occurring within the primary area of the final approach segment. The highest elevations of the relief occurring in the secondary areas of the final approach segment shown by a dashed line; or

b) minimum altitudes/heights in the intermediate and final approach segments indicated within bounded shaded blocks.

*Note 1.— For the ground profile portrayal, actual templates of the primary and secondary areas of the final approach segment are provided to the cartographer by the procedures specialist.*

*Note 2.— The minimum altitude/height portrayal is intended for use on charts depicting non-precision approaches with a final approach fix.*

...

4.11.10.8.3 For procedures in which DME is not required for use in the final approach segment but where a suitably located DME is available to provide advisory descent profile information, a table showing the altitudes/ heights shall be included.

4.11.10.8.4 For non-precision approach procedures with a final approach fix, the final approach descent gradient to the nearest one-tenth of a per cent and, in parentheses, descent angle to the nearest one-tenth of a degree shall be shown.

4.11.10.8.5 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.

4.11.10.8.6 When a final approach fix is specified at the final approach point for ILS, a clear indication shall be given whether it applies to the ILS, the associated ILS localizer only procedure, or both. In the case of MLS, a clear indication shall be given when an FAF has been specified at the final approach point.

4.11.10.8.7 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, ICAO Document 8168), Volume II, a cautionary note shall be included.

4.11.10.8.8 A note shall be included on the chart indicating the approach procedures that are authorized for simultaneous independent or dependent operations. The note shall include the runway(s) involved and if they are closely spaced.

#### 4.11.10.9 Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS, Document 8168), Volume II, Part III, Section 5, Chapter 2, 2.3 for RNAV procedures and Volume II, Part I, Section 4, Chapter 9, 9.4.1.3, for non-RNAV procedures, on the verso of the chart or as a separate, properly referenced sheet.

### 4.12 VISUAL APPROACH CHART — ICAO

...

#### 4.12.4 Format

The sheet size shall be 210 x 297 mm (8.27 x 11.69 in).

It would be advantageous to print the charts in several colors, selected to provide maximum legibility in varying degrees and kinds of light.

...

#### 4.12.7 Culture and topography

...

4.12.7.1.1 Geographical place names shall be included only when they are required to avoid confusion or ambiguity.

...

4.12.7.4 When shown, spot elevations shall be carefully selected.

*Note.— The value of certain spot elevations/heights in relation to both mean sea level and aerodrome elevation may be given.*

...

#### 4.12.9 Bearings, tracks and radials

...

4.12.9.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

#### **4.12.10 Aeronautical data**

...

4.12.10.2.2 The elevation of the top of obstacles shall be shown to the nearest (next higher) meter or foot.

...

### **4.13 AERODROME/HELIPORT CHART — ICAO**

...

#### **4.13.6 Aerodrome/heliport data**

...

4.13.6.2 For aerodromes accommodating aeroplanes with folding wing tips, the location where the wing tips may be safely extended shall be shown on the chart.

...

### **4.14 AERODROME GROUND MOVEMENT CHART — ICAO**

...

#### **4.14.2 Availability**

4.14.2.1 Where the detailed information needed for the ground movement of aircraft along taxiways to and from the aircraft stands and the parking and docking of aircraft cannot be shown with sufficient clarity on the Aerodrome/Heliport Chart — ICAO, the Aerodrome Ground Movement Chart — ICAO shall be made available in the manner prescribed in 4.1.3.2.

#### **4.14.3 Coverage and Scale.**

...

4.14.3.2 A linear scale shall be shown.

...

#### **4.14.5 Magnetic variation**

...

4.14.5.2 Magnetic variation to the nearest degree and its annual change shall be shown.

*Note.— This chart need not be True North orientated.*

#### **4.14.6 Aerodrome data**

...

4.14.6.2 For aerodromes accommodating aeroplanes with folding wing tips, the location where the wing tips may be safely extended shall be shown on the chart.

### **4.15 AIRCRAFT PARKING/DOCKING CHART — ICAO**

...

#### **4.15.2 Availability**

4.15.2.1 Where, due to the complexity of the terminal facilities, the information cannot be shown with sufficient clarity on the Aerodrome/Heliport Chart — ICAO or on the Aerodrome Ground Movement Chart — ICAO, the Aircraft Parking/ Docking Chart — ICAO shall be made available in the manner prescribed in 4.1.3.2.

#### **4.15.3 Coverage and Scale**

...

4.15.3.2 A linear scale shall be shown.

...

#### **4.15.5 Magnetic variation**

...

4.15.5.2 Magnetic variation to the nearest degree and its annual change shall be shown.

*Note.— This chart need not be True North orientated.*

...

### **4.16 WORLD AERONAUTICAL CHART — ICAO 1:1 000 000**

...

#### **4.16.2 Availability**

...

4.16.2.2 To ensure complete coverage of all land areas and adequate continuity in any one coordinated series, the selection of a scale of other than 1:1 000 000 shall be determined by regional agreement.

#### **4.16.3 Scale**

...

4.16.3.1.1 The length of the linear scales shall represent at least 200 km (110NM).

...

#### **4.16.4 Format**

...

4.16.4.3 The method of folding shall be as follows:

Fold the chart on the long axis, near the mid-parallel of latitude, face out; with the bottom half of the chart face upward, fold inwards near the meridian, and fold both halves backward in accordion folds.

4.16.4.4 Whenever practicable, the sheet lines shall conform with those shown in the index in Appendix 5.

*Note.— The area covered by a sheet may vary from the lines shown to satisfy particular requirements.*

*Note.— The value of adopting identical sheet lines for ICAO 1:1 000 000 Charts and the corresponding sheet of the International Map of the World (IMW), provided aeronautical requirements are not compromised, is recognized.*

4.16.4.5 Overlaps shall be provided by extending the chart area on the top and right side beyond the area given on the index. This overlap area shall contain all aeronautical, topographical, hydrographical and cultural information. The overlap should extend up to 28 km (15 NM), if possible, but in any case from the limiting parallels and meridians of each chart to the neat line.

#### **4.16.5 Projection**

...

4.16.5.3.1 The length of the graduation marks shall be approximately 1.3 mm (0.05 in) for the 1' intervals, and 2 mm (0.08 in) for the 5' intervals and 2 mm (0.08 in) extending on both sides of the graticule line for the 10' intervals.

...

#### **4.16.7 Culture and topography**

...



4.16.7.1.2 Cities and towns of sufficient size shall be indicated by the outline of their built-up areas and not of their established city limits.

...

4.16.7.2.2 Important tunnels shall be shown.

*Note.*— *A descriptive note may be added.*

...

4.16.7.3.2 Roads shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.

*Note.*— *The numbers or names of important highways may be shown.*

...

4.16.7.4.1 Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, forts, ruins, levees, pipelines, and rocks, bluffs, cliffs, sand dunes, isolated lighthouses, lightships, etc., when considered to be of importance for visual air navigation, shall be shown.

*Note.*— *Descriptive notes may be added.*

...

4.16.7.6.2 The tint covering large open water areas shall be kept very light.

*Note.*— *A narrow band of darker tone may be used along the shore line to emphasize this feature.*

4.16.7.6.3 Reefs and shoals including rocky ledges, tidal flats, isolated rocks, sand, gravel, stone and all similar areas shall be shown by symbols when of significant landmark value.

*Note.*— *Groups of rocks may be shown by a few representative rock symbols within the area.*

...

4.16.7.9.3 The spot elevation of the highest point in any sheet shall be cleared of hypsometric tinting.

...

4.16.7.11.1 Escarpments shall be shown when they are prominent landmarks or when cultural detail is very sparse.

...

4.16.7.12.1 Wooded areas shall be shown.

*Note.*— *On high latitude charts, the approximate extreme northern or southern limits of tree growth may be shown.*

...

## **4.17 AERONAUTICAL CHART — ICAO 1:500 000**

...

### **4.17.2 Availability**

4.17.2.1 The *Aeronautical Chart - ICAO 1:500 000* shall be made available in the manner prescribed in 4.1.3.2 for all areas delineated in Appendix 5, when operational requirement for visual navigation or chart production considerations indicates a need for this chart either as a substitute for or to supplement the *World Aeronautical Chart - ICAO 1:1 000 000*.

*Note.*— *The selection of this scale as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000 is covered by 4.16.2.1 and 4.16.2.2.*

### **4.17.3 Scales**

...

4.17.3.1.1 The length of the linear scale shall be not less than 200 mm (8 in).

...

### **4.17.4 Format**

...

4.17.4.3 The method of folding shall be as follows:

Fold the chart on the long axis near the mid-parallel of latitude, face out, with the bottom part of the chart face upward. Fold inwards near the meridian and fold both halves backward in accordion folds.

4.17.4.4 Whenever practicable, sheets shall be quarter sheets of the World Aeronautical Chart — ICAO 1:1 000 000. An appropriate index to adjacent sheets, showing the relationship between the two chart series shall be included on the face of the chart or on the reverse side.

*Note.— Sheet lines may be varied to satisfy particular requirements.*

4.17.4.5 Overlaps shall be provided by extending the chart area on the top and right side beyond the area given on the index. This overlap area should contain all aeronautical, topographical, hydrographical and cultural information. The overlap should extend up to 15 km (8 NM), if possible, but in any case from the limiting parallels and meridians of each chart to the neat line.

### **4.17.5 Projection**

...

4.17.5.2 The projection of the World Aeronautical Chart — ICAO 1:1 000 000 shall be used.

...

4.17.5.4.1 The length of the graduation marks shall be approximately 1.3 mm (0.05 in) for the 1' intervals, and 2 mm (0.08 in) for the 5' intervals and 2 mm (0.08 in) extending on both sides of the graticule line for the 10' intervals.

...

4.17.5.5.1 Each meridian and parallel shall be numbered within the body of the chart whenever this data is required operationally.

...

### **4.17.6 Identification**

...

4.17.6.1.1 Where applicable, sheets shall also be identified by the reference number of the corresponding World Aeronautical Chart — ICAO 1:1 000 000, with the addition of one or more of the following letter suffixes indicating the quadrant or quadrants:

...

### **4.17.7 Culture and topography**

...

4.17.7.1.2 Cities and towns of sufficient size shall be shown by the outline of their built-up areas and not of their established city limits.

...

4.17.7.3.2 Roads shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.

*Note.— The numbers or names of important highways may be shown.*

...

4.17.7.4.1 Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, lookout towers, forts, ruins, levees, pipelines, rocks, bluffs, cliffs, sand dunes, isolated lighthouses and lightships, when considered to be of importance for visual air navigation, shall be shown.

*Note.*— *Descriptive notes may be added.*

...

4.17.7.6.2 The tint covering large open water areas shall be kept very light.

*Note.*— *A narrow band of darker tone may be used along the shore line to emphasize this feature.*

4.17.7.6.3 Reefs and shoals, including rocky ledges, tidal flats, isolated rocks, sand, gravel, stone and all similar areas shall be shown by symbols when of significant landmark value.

*Note.*— *Groups of rocks may be shown by a few representative rock symbols within the area.*

...

4.17.7.9.3 The spot elevation of the highest point on any sheet shall be cleared of hypsometric tinting.

...

4.17.7.11.1 Escarpments shall be shown when they are prominent landmarks or when cultural detail is very sparse.

...

4.17.7.12.1 Wooded areas shall be shown.

*Note.*— *On high latitude charts the approximate extreme northern or southern limits of tree growth may be shown.*

...

## **4.18 AERONAUTICAL NAVIGATION CHART — ICAO SMALL SCALE**

...

### **4.18.2 Availability**

4.18.2.1 The Aeronautical Navigation Chart — ICAO Small Scale shall be made available in the manner prescribed in 4.1.3.2 for all areas delineated in Appendix 5, when operational requirement for visual navigation or chart production considerations indicates a need for this chart either as a substitute for or to supplement the World Aeronautical Chart - ICAO 1:1 000 000.

*Note.*— *The selection of this scale as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000 is covered by 4.16.2.1 and 4.16.2.2.*

### **4.18.3 Coverage and scale**

4.18.3.1 The Aeronautical Navigation Chart — ICAO Small Scale shall provide, as a minimum, complete coverage of the major land masses of the world.

*Note 1.*— *A sheet layout for this series is contained in the Aeronautical Chart Manual (ICAO Document 8697).*

*Note 2.— The sheet size may represent the maximum press size available to the producing agency.*

...

4.18.3.5 The length of the linear scale shall be not less than 200 mm (8 in).

...

#### **4.18.6 Culture and topography**

...

4.18.6.1.2 Cities and towns of sufficient size shall be indicated by the outline of their built-up areas and not of their established city limits.

...

4.18.6.2.2 Important tunnels shall be shown.

*Note.— A descriptive note may be added.*

...

4.18.6.3.2 Roads shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.

#### 4.18.6.4 Landmarks

Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, mine structures, forts, ruins, levees, pipelines and rocks, bluffs, cliffs, sand dunes, isolated lighthouses and lightships, when considered to be of importance for visual air navigation, shall be shown.

*Note.— Descriptive notes may be added.*

...

4.18.6.6.2 The tint covering large open water areas shall be kept very light.

*Note.— A narrow band of darker tone may be used along the shore line to emphasize this feature.*

...

4.18.6.6.3 Reefs and shoals including rocky ledges, tidal flats, isolated rocks, sand, gravel, stone and all similar areas shall be shown by symbols when of significant landmark value.

...

4.18.6.9.3 The spot elevation of the highest point in any sheet shall be cleared of hypsometric tinting.

...

4.18.6.11.1 Escarpments shall be shown when they are prominent landmarks or when cultural detail is very sparse.

...

4.18.6.12.1 Wooded areas of large extent shall be shown.

...

4.18.6.14.1 Subdued colors shall be used for the chart background to facilitate plotting.

4.18.6.14.2 Good color contrast shall be ensured to emphasize features important to visual air navigation.

...

4.18.8.3.1 Prohibited, restricted and danger areas shall be shown when considered to be of importance to air navigation.

...

4.18.8.4.1 Significant elements of the air traffic services system shall be shown when considered to be of importance to air navigation.

4.18.8.4.2 Where appropriate, the air defense identification zone (ADIZ) shall be shown and properly identified.

*Note.*— ADIZ procedures may be described in the chart legend.

...

## **4.19 Plotting Chart – ICAO**

...

### **4.19.2 Availability**

4.19.2.1 When deemed necessary, Plotting Chart - ICAO shall be made available, in the manner prescribed in 4.1.3.2, to cover major air routes over oceanic areas and sparsely settled areas used by international civil aviation.

*Note. 1*— In areas where the Enroute Chart — ICAO is provided there may be no requirement for a plotting chart.

*Note. 2* — Plotting Chart may be required in accordance with MOS-Aeronautical Charts, 2.3.6.

### **4.19.3 Coverage and scale**

4.19.3.1 Where practicable, the chart for a particular region shall cover major air routes and their terminals on a single sheet.

4.19.3.2 The scale shall be governed by the area to be covered.

*Note.*— Normally, the scale will range from 1:3 000 000 to 1:7 500 000.

### **4.19.4 Format**

4.19.4.1 The sheet shall be of a size that can be adapted for use on a navigator's plotting table.

### **4.19.5 Projection**

4.19.5.1 A conformal projection on which a straight line approximates a great circle shall be used.

...

4.19.5.2.1 The intervals shall be arranged to permit accurate plotting to be carried out with a minimum of time and effort.

...

4.19.5.2.3 Parallels and meridians shall be numbered so that a number appears at least once every 15 cm (6 in) on the face of the chart.

...

### **4.19.7 Culture and topography**

...

4.19.7.3 Particularly hazardous or prominent relief features shall be emphasized.

*Note.*— Large cities and towns may be shown.

...

#### **4.19.9 Aeronautical data**

...

4.19.9.2 Aeronautical ground lights and marine lights useful for air navigation shall be shown where other means of navigation are non-existent.

...

#### **4.21 ATC SURVEILLANCE MINIMUM ALTITUDE CHART — ICAO**

...

##### **4.21.2 Availability**

4.21.2.1 The ATC Surveillance Minimum Altitude Chart — ICAO shall be made available, in the manner prescribed in 4.1.3.2, where radar vectoring procedures are established and radar minimum altitudes cannot be shown adequately on the Area Chart — ICAO, Standard Departure Chart — Instrument (SID) — ICAO or Standard Arrival Chart — Instrument (STAR) — ICAO.

...

##### **4.21.4 Projection**

4.21.4.1 A conformal projection on which a straight line approximates a geodesic line shall be used.

4.21.4.2 Graduation marks shall be placed at consistent intervals along the neat lines, as appropriate.

...

##### **4.21.8 Bearings, tracks and radials**

...

4.21.8.2 Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

##### **4.21.9 Aeronautical data**

...

4.21.9.3.2 A textual description of communication failure procedures in relation to radar control should be provided and shall, whenever feasible, be shown on the chart or on the same page that contains the chart.

...

xxx

#### ***“End of Amendment”***

- i. ***Separability Clause.*** - If, for any reason, any provision of this Memorandum Circular is declared invalid or unconstitutional, the other part or parts thereof which are not affected thereby shall continue to be in full force and effect.
- ii. ***Repealing Clause.*** - All orders, rules, regulations and issuances, or parts thereof which are inconsistent with this Memorandum Circular are hereby repealed, superseded or modified accordingly.
- iii. ***Determination of changes.*** - To highlight the amendments and/or revisions in the Memorandum Circular, the deleted text shall be shown with strikethrough and the new

inserted text shall be highlighted with grey shading, as illustrated below:

1. Text deleted: ~~Text to be deleted is shown with a line through it.~~
2. New text inserted: New text is highlighted with grey shading.
3. New text replacing existing text: ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.

- iv. **Effectivity Clause.** - This Memorandum Circular shall take effect fifteen (15) days following completion of its publication in a newspaper of general circulation or the Official Gazette and a copy filed with the U.P. Law Center - Office of the National Administrative Register. The amendment shall be incorporated to Philippine Civil Aviation Regulations for Air Navigation Service in the next regular Amendment Cycle.

So Ordered. Signed this 01 day of AUG 2024, at the Civil Aviation Authority of the Philippines, MIA Road, Pasay City, Metro Manila, 1301.

  
CAPTAIN MANUEL ANTONIO L. TAMAYO  
Director General *cm*