BELIZE DEPARTMENT OF CIVIL AVIATION

BELIZE CIVIL AVIATION REGULATIONS
AERONAUTICAL CHARTS
BCAR 04

Issue: 2
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Issue and Revision System

THE REVISIONS TO THIS REGULATION WILL BE INDICATED BY A VERTICAL BAR ON THE LEFT SIDE, IN FRONT OF THE LINE, SECTION OR FIGURE THAT HAS BEEN AFFECTED. AN ISSUE WILL BE THE REPLACEMENT OF THE COMPLETE DOCUMENT.

THESE REVISIONS MUST BE RECORDED ON THE RECORD OF REVISIONS TABLE OF THIS DOCUMENT, INDICATING THE RESPECTIVE NUMBER, DATE IT WAS ENTERED AND SIGNED BY THE PERSON ENTERING THE REVISION.

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Record of Revisions

Number	Date entered:	Entered by:
First Issue	21/06/2018	BDCA
Second Issue	31/07/2025	BDCA

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Preamble

The BCAR 04 was emitted on May 2013 and it was developed based on ICAO's Annex 4, Eleventh edition of July 2009, amendment 56 dated 18 November 2010.

The Second Issue of BCAR 04 was developed based on ICAO´s Annex 4, eleventh edition of July 2009 with amendment 61 dated 4 November 2021 and corrigenda 2 dated 12 October 2017, and amendment 62 applicable on 28 November 2024.

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Table of Contents

SECTION 1 - REQUIREMENTS

PRESENTATION AND INTRODUCTION

1. PRESENTATION

1.1 Section one of BCAR 04 is presented in a single column. Each page is identified by its revision date, issue number and revision number.

1.2 This section Font is arial 10.

2. INTRODUCTION

2.1 This document contains the requirements for the development and applicability of the Aeronautical Charts.

2.2 This document is based on ICAO's Annex 4 text with 61st amendment dated 4 November 2021 and 62ndamendment dated 28 November 2021, issued and published by the International Civil Aviation Organization (ICAO).

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SUBPART A
GENERAL

BCAR 04 1.1 Definitions

Refer to **BCAR 05** Definitions and Units of Measurements

BCAR 04 1.2 Applicability and effectiveness

BCAR 04 1.2.1 Applicability

This **BCAR 04** applies to Aeronautical Charts service providers whether they are service providers from the Government of Belize or any other Aeronautical Charts service providers.

BCAR 04 1.2.2 All charts coming within the scope of this Regulation and bearing the aeronautical information date according to **BCAR 04 1.2.3** or later shall conform to the requirements relevant to the particular chart.

BCAR 04 1.2.2.1 All such charts shall in addition conform to the requirements relevant to the particular chart.

BCAR 04 1.2.3 Effectiveness

The **BCAR 04** will be in effect from its official publication.

BCAR 04 1.3 Availability

BCAR 04 1.3.1 Information

The Aeronautical Charts service provider on request by another Aeronautical Charts service provider shall provide all the information relating to the territory of Belize that is necessary to enable the Requirements of this **BCAR 04** to be met.

BCAR 04 1.3.2 Charts

The Aeronautical Charts service provider shall ensure, where specified, the availability of charts by any means appropriate for a particular chart or a single sheet of a chart series.
(See IEM BCAR 04 1.3.2)

BCAR 04 1.3.2.1 For any chart or single sheet of a chart series entirely contained within the territory of Belize, the Aeronautical Charts Service provider having jurisdiction over the territory shall either:

a) produce the chart or sheet itself; or

b) arrange for its production by the Aeronautical Charts service provider of another Contracting State or by an agency; or

c) provide the Aeronautical Charts service provider of another Contracting State prepared to accept an obligation to produce the chart or sheet with the data necessary for its production.

BCAR 04 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 Aeronautical Charts service providers 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 of allocation established by the Council of ICAO.
(See IEM BCAR 04 1.3.2.2)

BCAR 04 1.3.3 Guarantee and quality of charts

The Aeronautical Charts service provider 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.

BCAR 04 1.3.4 To improve worldwide dissemination of information on new charting techniques and production methods, appropriate charts produced by the Aeronautical Charts service provider shall be made available without charge to other Aeronautical Charts service providers of other Contracting States on request on a reciprocal basis.
(See IEM BCAR 04 1.3.3)

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SUBPART B
GENERAL SPECIFICATIONS

(See IEM 04 Subpart B)

BCAR 04 2.1 Operational requirements for charts

For the purposes of this Regulation, the total flight is divided into the following phases:

Phase 1 — Taxi from aircraft stand to take-off point

Phase 2 — Take-off and climb to en-route ATS route structure

Phase 3 — En-route ATS route structure

Phase 4 — Descent to approach

Phase 5 — Approach to land and missed approach

Phase 6 — Landing and taxi to aircraft stand.

BCAR 04 2.1.1 Each type of chart shall provide information relevant to the function of the chart and its design shall observe Human Factors principles which facilitate its optimum use.
(See IEM BCAR 04 2.1.1)

BCAR 04 2.1.2 Each type of chart shall provide information appropriate to the phase of flight to ensure the safe and expeditious operation of the aircraft.

BCAR 04 2.1.3 The presentation of information shall be accurate, free from distortion and clutter, unambiguous, and be readable under all normal operating conditions.

BCAR 04 2.1.4 Colours or tints and type size used shall be such that the chart can be easily read and interpreted by the pilot in varying conditions of natural and artificial light.

BCAR 04 2.1.5 The information shall be in a form which enables the pilot to acquire it in a reasonable time consistent with workload and operating conditions.

BCAR 04 2.1.6 The presentation of information provided on each type of chart shall permit smooth transition from chart to chart as appropriate to the phase of flight.

BCAR 04 2.1.7 The charts should be True North orientated.

BCAR 04 2.1.8 The basic sheet size of the charts should be 210 × 148 mm (8.27 × 5.82 in) (A5).

BCAR 04 2.2 The title of a chart or chart series

The title of a chart or chart series prepared in accordance with the specifications contained in this Regulation and intended to satisfy the function of the chart shall be that of the relevant subpart heading as modified by application of any Requirement contained therein, except that such title shall not include “ICAO” unless the chart conforms with all Requirements specified in this Subpart B and any specified for the particular chart.

BCAR 04 2.3 Miscellaneous information

BCAR 04 2.3.1 The marginal note

The marginal note layout shall be as given in BCAR 04 Appendix 1, except as otherwise specified for a particular chart.

BCAR 04 2.3.2 The face of each chart

The following information shall be shown on the face of each chart unless otherwise stated in the specification of the chart concerned:

a) designation or title of the chart series;
(See IEM BCAR 04 2.3.2)

b) name and reference of the sheet;

c) on each margin an indication of the adjoining sheet (when applicable).

BCAR 04 2.3.3 Symbols and abbreviations

A legend to the symbols and abbreviations used shall be provided. The legend shall be on the face or reverse of each chart except that where it is impracticable for reasons of space, a legend may be published separately.

BCAR 04 2.3.4 Margin of the chart

The name and adequate address of the producing agency shall be shown in the margin of the chart except that, where the chart is published as part of an aeronautical document, this information may be placed in the front of that document.

BCAR 04 2.4 Symbols

BCAR 04 2.4.1 Chart symbols

The Symbols used shall conform to those listed in BCAR 04 Appendix 2 – ICAO Chart Symbols, except that where it is desired to show on an aeronautical chart special features or items of importance to civil aviation for which no symbol is at present provided, any appropriate symbol may be chosen for this purpose, provided that it does not cause confusion with any existing ICAO chart symbol or impair the legibility of the chart.
(See IEM BCAR 04 2.4.1)

BCAR 04 2.4.2 Ground-based navigation aids

To represent ground-based navigation aids, intersections and waypoints, the same basic symbol shall be used on all charts on which they appear, regardless of chart purpose.

BCAR 04 2.4.3 Significant points

The symbol used for significant points shall be based on a hierarchy of symbols and selected in the following order: ground-based navigation aid, intersection, waypoint symbol. A waypoint symbol shall be used only when a particular significant point does not already exist as either a ground-based navigation aid or intersection.

BCAR 04 2.4.4 Significant points

The Aeronautical Charts service provider shall ensure that symbols are shown in the manner specified in BCAR 04 2.4.2, BCAR 04 2.4.3 and ICAO Chart Symbol 121 as set out in BCAR 04 Appendix 2.

BCAR 04 2.4.5 Reserved

BCAR 04 2.5 Units of measurement

BCAR 04 2.5.1 Distances shall be derived as geodesic distances.

BCAR 04 2.5.2 Distances shall be expressed in either kilometres or nautical miles or both, provided the units are clearly differentiated.

BCAR 04 2.5.3 Altitudes, elevations and heights shall be expressed in either metres or feet or both, provided the units are clearly differentiated.

BCAR 04 2.5.4 Linear dimensions on aerodromes and short distances shall be expressed in metres.

BCAR 04 2.5.5 The order of resolution of distances, dimensions, elevations and heights shall be that as specified for a particular chart.

BCAR 04 2.5.6 The units of measurement used to express distances, altitudes, elevations and heights shall be conspicuously stated on the face of each chart.

BCAR 04 2.5.7 Conversion scales (kilometres/nautical miles, metres/feet) shall be provided on each chart on which distances, elevations or altitudes are shown. The conversion scales shall be placed on the face of each chart.

BCAR 04 2.6 Scale and projection

BCAR 04 2.6.1 For charts of large areas, the name and basic parameters and scale of the projection shall be indicated.

BCAR 04 2.6.2 For charts of small areas, a linear scale only shall be indicated.

BCAR 04 2.7 Date of validity of aeronautical information

The date of validity of aeronautical information shall be clearly indicated on the face of each chart.

BCAR 04 2.8 Spelling of geographical names

BCAR 04 2.8.1 The symbols of the Roman alphabet shall be used for all writing.

BCAR 04 2.8.2 The names of places and of geographical features shall be used in the official spelling used in Belize, including the accents and diacritical marks used in the English alphabet.

BCAR 04 2.8.3 Where a geographical term such as “cape”, “point”, “gulf”, “river” is abbreviated on any particular chart, that word shall be spelt out in full in the language used by the publishing agency, in respect of the most important example of each type. Punctuation marks shall not be used in abbreviations within the body of a chart.

BCAR 04 2.8.4 Reserved

BCAR 04 2.9 Abbreviations

BCAR 04 2.9.1 Abbreviations shall be used by the Aeronautical Charts service provider on aeronautical charts whenever they are appropriate.

BCAR 04 2.9.2 Where applicable, abbreviations shall be selected by the Aeronautical Charts service provider from the Procedures for Air Navigation Services Abbreviations and Codes (ICAO Doc 8400).

BCAR 04 2.10 Political boundaries

BCAR 04 2.10.1 International boundaries shall be shown, but may be interrupted if data more important to the use of the chart would be obscured.

BCAR 04 2.10.2 Where the territory of States other than Belize appear on a chart, the names identifying the countries shall be indicated.
(See IEM BCAR 04 2.10.2)

BCAR 04 2.11 Colours

Colours used on charts shall conform to BCAR 04 Appendix 3 — Colour Guide.

BCAR 04 2.12 Relief

BCAR 04 2.12.1 Relief, where shown, shall be portrayed in a manner that will satisfy the chart users' need for:

a) orientation and identification;

b) safe terrain clearance;

c) clarity of aeronautical information when shown;

d) planning.

(See IEM BCAR 04 2.12.1)

BCAR 04 2.12.2 Where relief is shown by hypsometric tints, the tints used shall be based on those shown in the Hypsometric Tint Guide in BCAR 04 Appendix 4.

BCAR 04 2.12.3 Where spot elevations are used, they shall be shown for selected critical points.

BCAR 04 2.12.3.1 The value of spot elevations of doubtful accuracy shall be followed by the sign ±.

BCAR 04 2.13 Prohibited, restricted and danger areas

When prohibited, restricted or danger areas are shown, the reference or other identification shall be included, except that the nationality letters may be omitted.
(See IEM BCAR 04 2.13)

BCAR 04 2.14 Air traffic services airspaces

BCAR 04 2.14.1 When ATS airspace is shown on a chart, the class of airspace, the type, name or call sign, the vertical limits and the radio frequency(ies) to be used shall be indicated and the horizontal limits depicted in accordance with BCAR 04 Appendix 2 — Chart Symbols.

BCAR 04 2.14.2 Charts for visual flight

On charts used for visual flight, those parts of the ATS Airspace Classes table (Appendix 5) in BCAR ATS applicable to the airspace depicted on the chart shall be on the face or reverse of each chart.

BCAR 04 2.15 Magnetic variation

BCAR 04 2.15.1 True North and magnetic variation shall be indicated. The order of resolution of magnetic variation shall be that as specified for a particular chart.

BCAR 04 2.15.2 When magnetic variation is shown on a chart, the values shown shall be those for the year nearest to the date of publication that is divisible by 5, i.e. 2010, 2015, 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 shall be quoted.
(See IEM BCAR 04 2.15.2)

BCAR 04 2.15.3 Publication of a magnetic variation

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

BCAR 04 2.15.4 Single, common variation value.

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

BCAR 04 2.16 Typography

Samples of type suitable for use on aeronautical charts are included in the ICAO Aeronautical Chart Manual (Doc 8697).

BCAR 04 2.17 Aeronautical data

BCAR 04 2.17.1 The Aeronautical Charts service provider shall take all the necessary measures to introduce a properly organized quality system containing, processes and resources necessary to implement quality management at each function stage as outlined in BCAR 15 3.6. The execution of such quality management shall be made demonstrable for each function stage, when required. In addition, the Aeronautical Charts service provider shall ensure that established procedures exist in order that aeronautical data at any moment is traceable to its origin so to allow any data anomalies or errors, detected during the production/maintenance phases or in the operational use, to be corrected.
(See IEM BCAR 04 2.17.1)

BCAR 04 2.17.2 The Aeronautical Charts service provider shall ensure that chart resolution of aeronautical data shall be that as specified for a particular chart.
(See IEM BCAR 04 2.17.2)

BCAR 04 2.17.3 Data Integrity

The Aeronautical Charts service provider shall ensure that integrity of aeronautical data is maintained throughout the data process from origination to distribution to the next intended user.
(See IEM BCAR 04 2.17.3)

BCAR 04 2.17.4 Digital data error detection techniques

Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets.
(See IEM BCAR 04 2.17.4)

BCAR 04 2.18 Common reference systems

BCAR 04 2.18.1 Horizontal reference system

BCAR 04 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.
(See IEM BCAR 04 2.18.1.1)

BCAR 04 2.18.1.2 Transformed Geographical coordinates

Geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in BCAR ATS, Subpart B, and BCAR 14, Subpart B, shall be identified by an asterisk.

BCAR 04 2.18.1.3 Resolution of geographical coordinates

The order of chart resolution of geographical coordinates shall be that specified for a particular chart series
(See IEM BCAR 04 2.18.1.3)

BCAR 04 2.18.2 Vertical reference system

BCAR 04 2.18.2.1 Mean sea level (MSL) datum, which gives the relationship of gravity-related height (elevation) to a surface known as the geoid, shall be used as the vertical reference system.
(See IEM BCAR 04 2.18.2.1)

BCAR 04 2.18.2.2 Geoid undulation

In addition to the elevations referenced to MSL, for the specific surveyed ground positions, geoid undulation (referenced to the WGS-84 ellipsoid) for those positions shall also be published as specified for a particular chart.
(See IEM BCAR 04 2.18.2.2)

BCAR 04 2.18.2.3 Resolution of elevation and geoid undulation

The chart resolution of elevation and geoid undulation shall be that specified for a particular chart series.
(See IEM BCAR 04 2.18.2.3)

BCAR 04 2.18.3 Temporal reference system

BCAR 04 2.18.3.1 The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system.

BCAR 04 2.18.3.2 When a different temporal reference system is used for charting, this shall be indicated in GEN 2.1.2 of the Belize Aeronautical Information Publication (AIP).

BCAR 04 2.19 PANS OPS Criteria

All calculations and procedure design criteria for the charts in subparts I, J, K, L, M and U of this BCAR 04, shall be in accordance with ICAO's Document 8168 "Construction of visual and instrument flight procedures" and any other related ICAO document.

BCAR 04 2.20 Functions, responsibilities and job descriptions

The PANS OPS and Aeronautical Charts service providers shall develop functions and responsibilities; as well as, job descriptions for its technical staff.

BCAR 04 2.21 Minimum Qualifications

The PANS OPS and Aeronautical Charts service providers shall establish minimum qualifications and experience requirements for its technical staff.

BCAR 04 2.22 Training programme

The PANS OPS and Aeronautical Charts service providers shall develop and implement a training programme for its technical staff, that at a minimum, includes initial, specialized, OJT, recurrent training, and a training plan detailing and prioritizing what type of training will be provided during an established period.

BCAR 04 2.23 Training records

The PANS OPS and Aeronautical Charts service providers shall develop a system or methodology for maintaining training records for its technical staff.

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SUBPART C

AERODROME OBSTACLE CHART – ICAO TYPE A (OPERATING LIMITATIONS)

BCAR 04 3.1 Function

This chart, in combination with the relevant information published in the Belize AIP, shall provide the data necessary to enable an operator to comply with the operating limitations of BCAR-OPS 1 and BCAR-OPS 3.

BCAR 04 3.2 Availability

BCAR 04 3.2.1 Aerodrome Obstacle Charts — ICAO Type A (Operating Limitations) shall be made available in the manner prescribed in BCAR 04 1.3.2 for all aerodromes regularly used by international civil aviation, except for those aerodromes where there are no obstacles in the take-off flight path areas or where the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) is provided in accordance with BCAR 04 Subpart E.

BCAR 04 3.2.2 Where a chart is not required because no obstacles exist in the take-off flight path area, a notification to this effect shall be published in the Belize AIP.

BCAR 04 3.3 Units of measurement

BCAR 04 3.3.1 Elevations shall be shown to the nearest half-metre or to the nearest foot.

BCAR 04 3.3.2 Linear dimensions shall be shown to the nearest half-metre.

BCAR 04 3.4 Coverage and scale

BCAR 04 3.4.1 The extent of each plan shall be sufficient to cover all obstacles.
(See IEM BCAR 04 3.4.1)

BCAR 04 3.4.2 The horizontal scale shall be within the range of 1:10 000 to 1:15 000.

BCAR 04 3.4.3 As far as possible the horizontal scale shall be 1:10 000.
(See IEM BCAR 04 3.4.3)

BCAR 04 3.4.4 The vertical scale shall be ten times the horizontal scale.

BCAR 04 3.4.5 Linear scales

Horizontal and vertical linear scales showing both metres and feet shall be included in the charts.

BCAR 04 3.5 Format

BCAR 04 3.5.1 The charts shall depict a plan and profile of each runway, any associated stopway or clearway, the take-off flight path area and obstacles.

BCAR 04 3.5.2 The profile for each runway, stopway, clearway and the obstacles in the take-off flight path area shall be shown above its corresponding plan. The profile of an alternative take-off flight path area shall comprise a linear projection of the full take-off flight path and shall be disposed above its corresponding plan in the manner most suited

to the ready interpretation of the information.

BCAR 04 3.5.3 A profile grid shall be ruled over the entire profile area exclusive of the runway. The zero for vertical coordinates shall be mean sea level. The zero for horizontal coordinates shall be the end of the runway furthest from the take-off flight path area concerned. Graduation marks indicating the sub-divisions of intervals shall be shown along the base of the grid and along the vertical margins.

BCAR 04 3.5.3.1 The vertical grid shall have intervals of 30 m (100 ft) and the horizontal grid should have intervals of 300 m (1 000 ft).

BCAR 04 3.5.4 The chart shall include:

a) a box for recording the operational data specified in BCAR 04 3.8.3;

b) a box for recording amendments and dates thereof.

BCAR 04 3.6 Identification

The chart shall be identified by the name of the country in which the aerodrome is located, the name of the city or town or area which the aerodrome serves, the name of the aerodrome and the designator(s) of the runway(s).

BCAR 04 3.7 Magnetic variation

The magnetic variation to the nearest degree and date of information shall be indicated.

BCAR 04 3.8 Aeronautical data

BCAR 04 3.8.1 Obstacles

BCAR 04 3.8.1.1 Objects in the take-off flight path area which project above a plane surface having a 1.2 per cent slope and having a common origin with the take-off flight path area shall be regarded as obstacles, except those obstacles lying wholly below the shadow of other obstacles as defined in BCAR 04 3.8.1.2 need not be shown. Mobile objects such as boats, trains and trucks, which may project above the 1.2 per cent plane, shall be considered obstacles but shall not be considered as being capable of creating a shadow.

BCAR 04 3.8.1.2 The shadow of an obstacle is considered to be a plane surface originating at a horizontal line passing through the top of the obstacle at right angles to the centre line of the take-off flight path area. The plane covers the complete width of the take-off flight path area and extends to the plane defined in BCAR 04 3.8.1.1 or to the next higher obstacle if it occurs first. For the first 300 m (1 000 ft) of the take-off flight path area, the shadow planes are horizontal and beyond this point such planes have an upward slope of 1.2 per cent.

BCAR 04 3.8.1.3 If the obstacle creating a shadow is likely to be removed, objects that would become obstacles by its removal shall be shown.

BCAR 04 3.8.2 Take-off flight path area

BCAR 04 3.8.2.1 The take-off flight path area consists of a quadrilateral area on the surface of the earth lying directly below, and symmetrically disposed about, the take-off flight path. This area has the following characteristics:

a) it commences at the end of the area declared suitable for take-off (i.e. at the end of the runway or clearway as appropriate);

b) its width at the point of origin is 180 m (600 ft) and this width increases at the rate of 0.25D to a maximum of 1 800 m (6 000 ft), where D is the distance from the point of origin;

c) it extends to the point beyond which no obstacles exist or to a distance of 10.0 km (5.4 NM), whichever is the lesser.

BCAR 04 3.8.2.2 For runways serving aircraft having operating limitations which do not preclude the use of a take-off flight path gradient of less than 1.2 per cent, the extent of the take-off flight path area specified in BCAR 04 3.8.2.1 c) shall be increased to not less than 12.0 km (6.5 NM) and the slope of the plane surface specified in BCAR 04 3.8.1.1 and BCAR 04 3.8.1.2 shall be reduced to 1.0 per cent or less.
(See IEM BCAR 04 3.8.2.2)

BCAR 04 3.8.3 Declared distances

BCAR 04 3.8.3.1 The following information for each direction of each runway shall be entered in the space provided:
(See IEM BCAR 04 3.8.3.1)

a) take-off run available;

b) accelerate-stop distance available;

c) take-off distance available;

d) landing distance available.

BCAR 04 3.8.3.2 Where a declared distance is not provided because a runway is usable in one direction only, that runway shall be identified as “not usable for take-off, landing or both”.

BCAR 04 3.8.4 Plan and profile views

BCAR 04 3.8.4.1 The plan view shall show:

a) the outline of the runways by a solid line, including the length and width, the magnetic bearing to the nearest degree, and the runway number;

b) the outline of the clearways by a broken line, including the length and identification as such;

c) take-off flight path areas by a dashed line and the centre line by a fine line consisting of short and long dashes;

d) alternative take-off flight path areas. When alternative take-off flight path areas not centred on the extension of the runway centre line are shown, notes shall be provided explaining the significance of such areas;

e) obstacles, including:

1) the exact location of each obstacle together with a symbol indicative of its type;

2) the elevation and identification of each obstacle;

3) the limits of penetration of obstacles of large extent in a distinctive manner identified in the legend.

(See IEM BCAR 04 3.8.4.1)

BCAR 04 3.8.4.1.1 The nature of the runway and stopway surfaces shall be indicated.

BCAR 04 3.8.4.1.2 Stopways shall be identified as such and shall be shown by a broken line.

BCAR 04 3.8.4.1.3 When stopways are shown, the length of each stopway shall be indicated.

BCAR 04 3.8.4.2 The profile view shall show:

a) the profile of the centre line of the runway by a solid line and the profile of the centre line of any associated stopways and clearways by a broken line;

b) the elevation of the runway centre line at each end of the runway, at the stopway and at the origin of each take-off flight path area, and at each significant change in slope of runway and stopway;

c) obstacles, including:

1) each obstacle by a solid vertical line extending from a convenient grid line over at least one other grid line to the elevation of the top of the obstacle;

2) identification of each obstacle;

3) the limits of penetration of obstacles of large extent in a distinctive manner identified in the legend.

(See IEM BCAR 04 3.8.4.2)

BCAR 04 3.9 Accuracy

BCAR 04 3.9.1 The order of accuracy attained shall be shown on the chart.

BCAR 04 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).

BCAR 04 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 000ft) and increasing at a rate of 1 per 1 000.

BCAR 04 3.9.4 Datum.

Where no accurate datum for vertical reference is available, the elevation of the datum used shall be stated and shall be identified as assumed.

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SUBPART D
AERODROME OBSTACLE CHART — ICAO TYPE B

BCAR 04 4.1 Function

This chart shall provide information to satisfy the following functions:

a) the determination of minimum safe altitudes/heights including those for circling procedures;

b) the determination of procedures for use in the event of an emergency during take-off or landing;

c) the application of obstacle clearing and marking criteria; and

d) the provision of source material for aeronautical charts.

BCAR 04 4.2 Availability

BCAR 04 4.2.1 Aerodrome Obstacle Charts — ICAO Type B shall be made available, in the manner prescribed in BCAR 04 1.3.2, for all aerodromes regularly used by international civil aviation except for those aerodromes where the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) is provided in accordance with BCAR 04 Subpart E.

BCAR 04 4.2.2 When a chart combining the specifications of Subparts C and D is made available, it shall be called the Aerodrome Obstacle Chart — (ICAO Comprehensive).

BCAR 04 4.3 Units of measurement

BCAR 04 4.3.1 Elevations shall be shown to the nearest half-metre or to the nearest foot.

BCAR 04 4.3.2 Linear dimensions shall be shown to the nearest half-metre.

BCAR 04 4.4 Coverage and scale

BCAR 04 4.4.1 The extent of each plan shall be sufficient to cover all obstacles.
(See IEM BCAR 04 4.4.1)

BCAR 04 4.4.2 The horizontal scale shall be within the range of 1:10 000 to 1:20 000.

BCAR 04 4.4.3 A horizontal linear scale showing both metres and feet shall be included in the chart. When necessary, a linear scale for kilometres and a linear scale for nautical miles shall also be shown.

BCAR 04 4.5 Format

The charts shall include:

a) any necessary explanation of the projection used;

b) any necessary identification of the grid used;

c) a notation indicating that obstacles are those which penetrate the surfaces specified in BCAR 14, Subpart D;

d) a box for recording amendments and dates thereof; and

e) outside the neat line, every minute of latitude and longitude marked in degrees and minutes.

(See IEM BCAR 04 4.5)

BCAR 04 4.6 Identification

The chart shall be identified by the name of the country in which the aerodrome is located, the name of the city or town or area which the aerodrome serves, and the name of the aerodrome.

BCAR 04 4.7 Culture and topography

BCAR 04 4.7.1 Drainage and hydrographic details shall be kept to a minimum.

BCAR 04 4.7.2 Buildings and other salient features associated with the aerodrome shall be shown. Wherever possible, they shall be shown to scale.

BCAR 04 4.7.3 All objects, either cultural or natural, that project above the take-off and approach surfaces specified in BCAR 04 4.9 or the clearing and marking surfaces specified in BCAR 14, Subpart D, shall be shown.

BCAR 04 4.7.4 Roads and railroads within the take-off and approach area, and less than 600 m (2 000 ft) from the end of the runway or runway extensions, shall be shown.

(See IEM BCAR 04 4.7.4)

BCAR 04 4.8 Magnetic variation

The chart shall show a compass rose orientated to the True North, or a North point, showing the magnetic variation to the nearest degree with the date of magnetic information and annual change.

BCAR 04 4.9 Aeronautical data

BCAR 04 4.9.1 The charts shall show:

a) the aerodrome reference point and its geographical coordinates in degrees, minutes and seconds;

b) the outline of the runways by a solid line;

c) the length and width of the runway;

d) the magnetic bearing to the nearest degree of the runway and the runway number;

e) the elevation of the runway centre line at each end of the runway, at the stopway, at the origin of each take-off and approach area, and at each significant change of slope of runway and stopway;

f) taxiways, aprons and parking areas identified as such, and the outlines by a solid line;

g) stopways identified as such and depicted by a broken line;

h) the length of each stopway;

i) clearways identified as such and depicted by a broken line;

j) the length of each clearway;

k) take-off and approach surfaces identified as such and depicted by a broken line;

l) take-off and approach areas;
(See IEM BCAR 04 4.9.1 (l))

m) obstacles at their exact location, including:

1) a symbol indicative of their type;

2) elevation;

3) identification;

4) limits of penetration of large extent in a distinctive manner identified in the legend;
(See IEM BCAR 04 4.9.1 (m) (4))

n) any additional obstacles, as determined by BCAR 04 3.8.1.1 including the obstacles in the shadow of an obstacle, which would otherwise be exempted.
(See IEM BCAR 04 4.9.1 (n))

BCAR 04 4.9.1.1 The nature of the runway and stopway surfaces shall be given.

BCAR 04 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.

BCAR 04 4.9.1.3 The extent of tree areas and relief features, part of which constitute obstacles, shall be shown.

BCAR 04 4.10 Accuracy

BCAR 04 4.10.1 The order of accuracy attained shall be shown on the chart.

BCAR 04 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).

BCAR 04 4.10.3 The order of 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:

a) Take-off and approach areas:

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

2) 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.

b) Other areas:

1) horizontal distances: 5 m (15 ft) within 5 000 m (15 000 ft) of the aerodrome reference point and 12 m (40 ft) beyond that area;

2) vertical distances: 1 m (3 ft) within 1 500 m (5 000 ft) of the aerodrome reference point increasing at a rate of 1 per 1 000.

BCAR 04 4.10.4 Datum

Where no accurate datum for vertical reference is available, the elevation of the datum used shall be stated and identified as assumed.

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SUBPART E
AERODROME TERRAIN AND OBSTACLE CHART — ICAO (ELECTRONIC)

BCAR 04 5.1 Function

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

a) enable an operator to comply with the operating limitations of BCAR–OPS 1 and BCAR–OPS 3, by developing contingency procedures for use in the event of an emergency during a missed approach or take-off, and by performing aircraft operating limitations analysis; and

b) support the following air navigation applications:

1) instrument procedure design (including circling procedure);

2) aerodrome obstacle restriction and removal; and

3) provision of source data for the production of other aeronautical charts.

BCAR 04 5.2 Availability

BCAR 04 5.2.1 Aerodrome Terrain and Obstacle Charts — ICAO (Electronic) shall be made available in the manner prescribed in BCAR 04 1.3.2 for aerodromes regularly used by international civil aviation.
(See IEM BCAR 04 5.2.1)

BCAR 04 5.2.2 Aerodrome Terrain and Obstacle Charts — ICAO (Electronic) shall be made available in the manner prescribed in BCAR 04 1.3.2 for all aerodromes regularly used by international civil aviation.

BCAR 04 5.2.3 The Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) shall also be made available in hard copy format upon request.
(See IEM BCAR 04 5.2.3)

BCAR 04 5.2.4 The ISO 19100 series of standards for geographic information shall be used as a general data modelling framework.
(See IEM BCAR 04 5.2.4)

BCAR 04 5.3 Identification

Electronic charts shall be identified by the name of the country in which the aerodrome is located, the name of the city or town which the aerodrome serves, and the name of the aerodrome.

BCAR 04 5.4 Chart coverage

The extent of each chart shall be sufficient to cover Area 2 as specified in BCAR 15, Subpart E.

BCAR 04 5.5 Chart content

BCAR 04 5.5.1 General

BCAR 04 5.5.1.1 When developing computer graphic applications that are used to portray features on the chart, the relationships between features, feature attributes, and the underlying spatial geometry and associated topological relationships shall be specified by an application schema. Portrayed information shall be provided on the basis of portrayal specifications applied according to defined portrayal rules. Portrayal specifications and portrayal rules shall not be part of the data set. Portrayal rules shall be stored in a portrayal catalogue which shall make reference to separately stored portrayal specifications.
(See IEM BCAR 04 5.5.1.1)

BCAR 04 5.5.1.2 Symbols used to portray features shall be in accordance with BCAR 04 2.4 and Appendix 2 — ICAO Chart Symbols.

BCAR 04 5.5.2 Terrain feature

BCAR 04 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 BCAR 15, Subpart E.
(See IEM BCAR 04 5.5.2.1)

BCAR 04 5.5.2.2 The terrain feature shall be portrayed in a manner that provides an effective general impression of a terrain. This shall be a representation of terrain surface by continuous elevation values at all intersections of the defined grid, also known as the Digital Elevation Model (DEM).
(See IEM BCAR 04 5.5.2.2)

BCAR 04 5.5.2.3 Representation of terrain surface shall be provided as a selectable layer of contour lines in addition to the DEM.

BCAR 04 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.

BCAR 04 5.5.2.5 The portrayed terrain feature shall be linked to the following associated attributes in the database(s):

a) horizontal positions of grid points in geographic coordinates and elevations of the points;

b) surface type;

c) contour line values, if provided; and

d) names of cities, towns and other prominent topographic features.

BCAR 04 5.5.2.6 Additional terrain attributes provided in the database(s) shall be linked to the portrayed terrain feature.
(See IEM BCAR 04 5.5.2.6)

BCAR 04 5.5.3 Obstacle features

BCAR 04 5.5.3.1 Obstacle features, and associated attributes, portrayed or database-linked to the chart shall be based on obstacle data sets which satisfy the requirements of BCAR 15, Subpart E.
(See IEM BCAR 04 5.5.3.1)

BCAR 04 5.5.3.2 Each obstacle shall be portrayed by an appropriate symbol and obstacle identifier.
BCAR 04 5.5.3.3 The portrayed obstacle feature shall be linked to the following associated attributes in the database(s):

a. horizontal position in geographic coordinates and associated elevation;

b. obstacle type; and

c. obstacle extent, if appropriate.

BCAR 04 5.5.3.4 Additional obstacle attributes provided in the database(s) shall be linked to the portrayed obstacle feature.
(See IEM BCAR 04 5.5.3.4)

BCAR 04 5.5.4 Aerodrome features

BCAR 04 5.5.4.1 Aerodrome features, and associated attributes, portrayed and database-linked to the chart shall be based on aerodrome data which satisfy the requirements of BCAR 15, Subpart E.
(See IEM BCAR 5.5.4.1)

BCAR 04 5.5.4.2 The following aerodrome features shall be portrayed by an appropriate symbol:

a) aerodrome reference point;

b) runway(s), with designation numbers, and if available, stopway(s) and clearway(s); and

c) taxiways, aprons, large buildings and other prominent aerodrome features.

BCAR 04 5.5.4.3 The portrayed aerodrome feature shall be linked to the following associated attributes in the database(s):

a) geographical coordinates of the aerodrome reference point;

b) aerodrome magnetic variation, year of information and annual change;
(See IEM BCAR 04 5.5.4.3 (b))

c) length and width of runway(s), stopway(s) and clearway(s);

d) type of surface of runway(s) and stopway(s);

e) magnetic bearings of the runway(s) to the nearest degree;

f) elevations at each end of runway(s), stopway(s) and clearway(s), and at each significant change in slope of runway(s) and stopway(s);

g) declared distances for each runway direction, or the abbreviation “NU” where a runway direction cannot be used for take-off or landing or both.

(See IEM BCAR 04 5.5.4.3)

BCAR 04 5.5.5 Radio navigation aid features

Each radio navigation aid feature located within the chart coverage shall be portrayed by an appropriate symbol.
(See IEM BCAR 04 5.5.5)

BCAR 04 5.6 Accuracy and resolution

BCAR 04 5.6.1 The order of accuracy of aeronautical, terrain and obstacle data shall be in accordance with its intended use.
(See IEM BCAR 04 5.6.1)

BCAR 04 5.6.2 The aeronautical, terrain and obstacle data resolution shall be commensurate with the actual data accuracy.
(See IEM BCAR 04 5.6.2)

BCAR 04 5.7 Electronic functionality

BCAR 04 5.7.1 It shall be possible to vary the scale at which the chart is viewed. Symbols and text size shall vary with chart scale to enhance readability.

BCAR 04 5.7.2 Information on the chart shall be geo-referenced, and it shall be possible to determine cursor position to at least the nearest second.

BCAR 04 5.7.3 The chart shall be compatible with widely available desktop computer hardware, software and media.

BCAR 04 5.7.4 The chart shall include its own “reader” software.

BCAR 04 5.7.5 It shall not be possible to remove information from the chart without an authorized update.

BCAR 04 5.7.6 When, due to congestion of information, the details necessary to support the function of the chart cannot be shown with sufficient clarity on a single comprehensive chart view, selectable information layers shall be provided to allow for the customized combination of information.
(See IEM BCAR 04 5.7.6)

BCAR 04 5.7.7 It shall be possible to print the chart in hard copy format according to the content specifications and scale determined by the user.
(See IEM BCAR 04 5.7.7)

BCAR 04 5.8 Chart data product specifications

BCAR 04 5.8.1 A comprehensive statement of the data sets comprising the chart shall be provided in the form of data product specifications on which basis air navigation users will be able to evaluate the chart data product and determine whether it fulfils the requirements for its intended use (application).

BCAR 04 5.8.2 The chart data product specifications shall include an overview, a specification scope, a data product identification, data content information, the reference systems used, the data quality requirements, and information on data capture, data maintenance, data portrayal, data product delivery, as well as any additional information available, and metadata.
(See IEM BCAR 04 5.8.2)

BCAR 04 5.8.3 The overview of the chart data product specifications shall provide an informal description of the product and shall contain general information about the data product. The specification scope of the chart data product specifications shall contain the spatial (horizontal) extent of the chart coverage. The chart data product identification shall include the title of the product, a brief narrative summary of the content and purpose, and a description of the geographic area covered by the chart.

BCAR 04 5.8.4 The data content of the chart data product specifications shall clearly identify the type of coverage and/or imagery and shall provide a narrative description of each.
(See IEM BCAR 04 5.8.4)

BCAR 04 5.8.5 The chart data product specifications shall include information that defines the reference systems used. This shall include the spatial reference system (horizontal and vertical) and, if appropriate, temporal reference system. The chart data product specifications shall identify the data quality requirements. This shall include a statement on acceptable conformance quality levels and corresponding data quality measures. This statement shall cover all the data quality elements and data quality sub-elements, even if only to state that a specific data quality element or sub-element is not applicable.
(See IEM BCAR 04 5.8.5)

BCAR 04 5.8.6 The chart data product specifications shall include a data capture statement which shall be a general description of the sources and of processes applied for the capture of chart data. The principles and criteria applied in the maintenance of the chart shall also be provided in the chart data product specifications, including the frequency with which the chart product is updated. Of particular importance shall be the maintenance information of obstacle data sets included on the chart and an indication of the principles, methods and criteria applied for obstacle data maintenance.

BCAR 04 5.8.7 The chart data product specifications shall contain information on how data are portrayed on the chart, as detailed in BCAR 04 5.5.1.1. The chart data product specifications shall also contain data product delivery information which shall include delivery formats and delivery medium information.

BCAR 04 5.8.8 The core chart metadata elements shall be included in the chart data product specifications. Any additional metadata items required to be supplied shall be stated in the product specifications together with the format and encoding of the metadata.
(See IEM BCAR 04 5.8.8)

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SUBPART F
PRECISION APPROACH TERRAIN CHART — ICAO

BCAR 04 6.1 Function

The chart shall provide detailed terrain profile information within a defined portion of the final approach so as to enable aircraft operating agencies to assess the effect of the terrain on decision height determination by the use of radio altimeters.

BCAR 04 6.2 Availability

BCAR 04 6.2.1 The Precision Approach Terrain Chart — ICAO shall be made available for all precision approach runways Categories II and III at aerodromes used by international civil aviation, except where the requisite information is provided in the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) in accordance with BCAR 04, Subpart E.

BCAR 04 6.2.2 The Precision Approach Terrain Chart — ICAO shall be revised whenever any significant change occurs.

BCAR 04 6.3 Scale

BCAR 04 6.3.1 The horizontal scale shall be 1:2 500, and the vertical scale 1:500.

BCAR 04 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 shall be 1:5 000.

BCAR 04 6.4 Identification

The chart shall be identified by the name of the country in which the aerodrome is located, the name of the city or town or area which the aerodrome serves, the name of the aerodrome and the designator of the runway.

BCAR 04 6.5 Plan and profile information

BCAR 04 6.5.1 The chart shall include:

a) a plan showing contours at 1 m (3 ft) intervals in the area 60 m (200 ft) on either side of the extended centre line of the runway, to the same distance as the profile, the contours to be related to the runway threshold;

b) an indication where the terrain or any object thereon, within the plan defined in a), differs by ±3 m (10 ft) in height from the centre line profile and is likely to affect a radio altimeter;

c) a profile of the terrain to a distance of 900 m (3 000 ft) from the threshold along the extended centre line of the runway.

BCAR 04 6.5.2 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.

BCAR 04 6.5.3 The ILS reference datum height shall be shown to the nearest half metre or foot.

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SUBPART G
ENROUTE CHART — ICAO

BCAR 04 7.1 Function

This chart shall provide flight crews with information to facilitate navigation along ATS routes in compliance with air traffic services procedures.
(See IEM BCAR 04 7.1)

BCAR 04 7.2 Availability

BCAR 04 7.2.1 The Enroute Chart — ICAO Shall be made available in the manner prescribed in BCAR 04 1.3.2 for all areas where flight information regions have been established.
(See IEM BCAR 04 7.2.1)

BCAR 04 7.2.2 Where different air traffic services routes, position reporting requirements or lateral limits of flight information regions or control areas exist in different layers of airspace and cannot be shown with sufficient clarity on one chart, separate charts shall be provided.

BCAR 04 7.3 Coverage and scale
(See IEM BCAR 04 7.3)

BCAR 04 7.3.1 Layout of sheet lines shall be determined by the density and pattern of the ATS route structure.

BCAR 04 7.3.2 Large variations of scale between adjacent charts showing a continuous route structure shall be avoided.

BCAR 04 7.3.3 An adequate overlap of charts shall be provided to ensure continuity of navigation.

BCAR 04 7.4 Projection

BCAR 04 7.4.1 A conformal projection on which a straight line approximates a great circle shall be used.

BCAR 04 7.4.2 Parallels and meridians shall be shown at suitable intervals.

BCAR 04 7.4.3 Graduation marks shall be placed at consistent intervals along selected parallels and meridians.

BCAR 04 7.5 Identification

Each sheet shall be identified by chart series and number.

BCAR 04 7.6 Culture and topography

BCAR 04 7.6.1 Generalized shore lines of all open water areas, large lakes and rivers shall be shown except where they conflict with data more applicable to the function of the chart.

BCAR 04 7.6.2 Within each quadrilateral formed by the parallels and meridians, the area minimum altitude shall be shown, except as provided for in BCAR 04 7.6.3.
(See IEM BCAR 04 7.6.2)

BCAR 04 7.6.3 In areas of high latitude where it is determined by the Aeronautical Charts service provider that True

North orientation of the chart is impractical, the area minimum altitude shall be shown within each quadrilateral formed by reference lines of the graticule (grid) used.

BCAR 04 7.6.4 Where charts are not True North orientated, this fact and the selected orientation used shall be clearly indicated.

BCAR 04 7.7 Magnetic variation

Isogonals shall be indicated and the date of the isogonic information given.

BCAR 04 7.8 Bearings, tracks and radials

BCAR 04 7.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in BCAR 04 7.8.2. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g. 290° (294.9°T).

BCAR 04 7.8.2 Reserved

BCAR 04 7.8.3 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.

BCAR 04 7.9 Aeronautical data

BCAR 04 7.9.1 Aerodromes

All aerodromes used by international civil aviation to which an instrument approach can be made shall be shown.
(See IEM BCAR 04 7.9.1)

BCAR 04 7.9.2 Prohibited, restricted and danger areas

Prohibited, restricted and danger areas relevant to the layer of airspace shall be depicted with their identification and vertical limits.

BCAR 04 7.9.3 Air traffic services system

BCAR 04 7.9.3.1 Where appropriate, the components of the established air traffic services system shall be shown.

BCAR 04 7.9.3.1.1 The components shall include the following:

a) the radio navigation aids associated with the air traffic services system together with their names, identifications, frequencies and geographical coordinates in degrees, minutes and seconds;

b) in respect of DME, additionally the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);

c) an indication of all designated airspace, including lateral and vertical limits and the appropriate class of airspace;

d) 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;

(See IEM BCAR 04 7.9.3.1.1(d))

e) all significant points which define the ATS routes and are not marked by the position of a radio navigation aid, together with their name-codes and geographical coordinates in degrees, minutes and seconds;

f) in respect of waypoints defining VOR/DME area navigation routes, additionally,

1) the station identification and radio frequency of the reference VOR/DME;

2) the bearing to the nearest tenth of a degree and the distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference VOR/ DME, if the waypoint is not collocated with it;

g) an indication of all compulsory and “on-request” reporting points and ATS/MET reporting points;

h) the distances to the nearest kilometre or nautical mile between significant points constituting turning points or reporting points;
(See IEM BCAR 04 7.9.3.1.1(h))

i) change-over points on route segments defined by reference to very high frequency omnidirectional radio ranges, indicating the distances to the nearest kilometre or nautical mile to the navigation aids;
(See IEM BCAR 04 7.9.3.1.1(i))

j) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 metres or 100 feet (see BCAR ATS, 2.22);

k) communication facilities listed with their channels and, if applicable, logon address and satellite voice communications (SATVOICE) number; and

l) air defence identification zone (ADIZ) properly identified.
(See IEM BCAR 04 7.9.3.1.1(l))

BCAR 04 7.9.4 Supplementary information

BCAR 04 7.9.4.1 Details of departure and arrival routes and associated holding patterns in terminal areas shall be shown unless they are shown on an Area Chart, a Standard Departure Chart — Instrument (SID) — ICAO or a Standard Arrival Chart — Instrument (STAR) — ICAO.
(See IEM BCAR 04 7.9.4.1)

BCAR 04 7.9.4.2 Where established, altimeter setting regions shall be shown and identified.

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SUBPART H
AREA CHART — ICAO

BCAR 04 8.1 Function

This chart shall provide the flight crew with information to facilitate the following phases of instrument flight:

a) the transition between the en-route phase and approach to an aerodrome;

b) the transition between take-off/missed approach and en-route phase of flight; and

c) flights through areas of complex ATS routes or airspace structure.
(See IEM BCAR 04 8.1(c))

BCAR 04 8.2 Availability

BCAR 04 8.2.1 The Area Chart – ICAO shall be made available in the manner prescribed in BCAR 04 1.3.2 where the air traffic services routes or position reporting requirements are complex and cannot be adequately shown on an Enroute Chart - ICAO.

BCAR 04 8.2.2 Where air traffic services routes or position reporting requirements are different for arrivals and for departures, and these cannot be shown with sufficient clarity on one chart, separate charts shall be provided.
(See IEM BCAR 04 8.2.2)

BCAR 04 8.3 Coverage and scale

BCAR 04 8.3.1 The coverage of each chart shall extend to points that effectively show departure and arrival routes.

BCAR 04 8.3.2 The chart shall be drawn to scale and a scale-bar shown.

BCAR 04 8.4 Projection

BCAR 04 8.4.1 A conformal projection on which a straight line approximates a great circle shall be used.

BCAR 04 8.4.2 Parallels and meridians shall be shown at suitable intervals.

BCAR 04 8.4.3 Graduation marks shall be placed at consistent intervals along the neat lines, as appropriate.

BCAR 04 8.5 Identification

The chart shall be identified by a name associated with the airspace portrayed.
(See IEM BCAR 04 8.5)

BCAR 04 8.6 Culture and topography

BCAR 04 8.6.1 Generalized shorelines of all open water areas, large lakes and rivers shall be shown except where they conflict with data more applicable to the function of the chart.

BCAR 04 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 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.
(See IEM BCAR 04 8.6.2)

BCAR 04 8.7 Magnetic variation

The average magnetic variation of the area covered by the chart shall be shown to the nearest degree.

BCAR 04 8.8 Bearings, tracks and radials

BCAR 04 8.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in BCAR 04 8.8.2. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g. 290° (294.9°T).

BCAR 04 8.8.2 Reserved

BCAR 04 8.8.3 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.

BCAR 04 8.9 Aeronautical data

BCAR 04 8.9.1 Aerodromes

All aerodromes which affect the terminal routings shall be shown. Where appropriate, a runway pattern symbol shall be used.

BCAR 04 8.9.2 Prohibited, restricted and danger areas

Prohibited, restricted and danger areas shall be depicted with their identification and vertical limits.

BCAR 04 8.9.3 Area minimum altitudes

Area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians.
(See IEM BCAR 04 8.9.3)

BCAR 04 8.9.4 Air traffic services system

BCAR 04 8.9.4.1 The components of the established relevant air traffic services system shall be shown.

BCAR 04 8.9.4.1.1 The components shall include the following:

a) the radio navigation aids associated with the air traffic services system, together with their names, identifications, frequencies and geographical coordinates in degrees, minutes and seconds;

b) in respect of DME, additionally the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);

c) terminal radio aids which are required for outbound and inbound traffic and for holding patterns;

d) the lateral and vertical limits of all designated airspace and the appropriate class of airspace;

e) the designation of the navigation specification(s) including any limitations, where established;

f) holding patterns and terminal routings, together with the route designators, and the track to the nearest degree along each segment of the prescribed airways and terminal routings;

g) all significant points which define the terminal routings and are not marked by the position of a radio navigation aid, together with their name-codes and geographical coordinates in degrees, minutes and seconds;

h) in respect of waypoints defining VOR/DME area navigation routes, additionally,

1) the station identification and radio frequency of the reference VOR/DME;

2) the bearing to the nearest tenth of a degree and the distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference VOR/DME, if the waypoint is not collocated with it;

i) an indication of all compulsory and “on-request” reporting points;

j) the distances to the nearest kilometre or nautical mile between significant points constituting turning points or reporting points;
(See IEM BCAR 04 8.9.4.1.1(j))

k) change-over points on route segments defined by reference to very high frequency omnidirectional radio ranges, indicating the distances to the nearest kilometre or nautical mile to the radio navigation aids;
(See IEM BCAR 04 8.9.4.1.1(k))

l) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 metres or 100 feet (see BCAR ATS, 2.22);

m) established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;
(See IEM BCAR 04 8.9.4.1.1(m))

n) area speed and level/altitude restrictions where established;

o) communication facilities listed with their channels and, if applicable, logon address and SATVOICE number; and

p) an indication of “flyover” significant points.

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SUBPART I
STANDARD DEPARTURE CHART - INSTRUMENT (SID) — ICAO

BCAR 04 9.1 Function

This chart shall provide the flight crew with information to enable it to comply with the designated standard departure route — instrument from take-off phase to the en-route phase.
(See IEM BCAR 04 9.1)

BCAR 04 9.2 Availability

The Standard Departure Chart — Instrument (SID) – ICAO shall be made available wherever a standard departure route — instrument has been established and cannot be shown with sufficient clarity on the Area Chart - ICAO.

BCAR 04 9.3 Coverage and scale

BCAR 04 9.3.1 The coverage of the chart shall be sufficient to indicate the point where the departure route begins and the specified significant point at which the en-route phase of flight along a designated air traffic services route can be commenced.
(See IEM BCAR 04 9.3.1)

BCAR 04 9.3.2 The chart shall be drawn to scale.

BCAR 04 9.3.3 If the chart is drawn to scale, a scale-bar shall be shown.

BCAR 04 9.3.4 When the chart is not drawn to scale, the annotation “NOT TO SCALE” shall be shown and the symbol for scale-break shall be used on tracks and other aspects of the chart which are too large to be drawn to scale.

BCAR 04 9.4 Projection

BCAR 04 9.4.1 A conformal projection on which a straight line approximates a great circle shall be used.

BCAR 04 9.4.2 When the chart is drawn to scale, parallels and meridians shall be shown at suitable intervals.

BCAR 04 9.4.3 Graduation marks shall be placed at consistent intervals along the neat lines.

BCAR 04 9.5 Identification

The chart shall be identified by the name of the city or town or area which the aerodrome serves, the name of the aerodrome and the identification of the standard departure route(s) — instrument as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part I, Section 3, Chapter 5.
(See IEM BCAR 04 9.5)

BCAR 04 9.6 Culture and topography

BCAR 04 9.6.1 Where the chart is drawn to scale, generalized shore lines of all open water areas, large lakes and rivers shall be shown except where they conflict with data more applicable to the function of the chart.

BCAR 04 9.6.2 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.
(See IEM BCAR 04 9.6.2)

BCAR 04 9.7 Magnetic variation

Magnetic variation used in determining the magnetic bearings, tracks and radials shall be shown to the nearest degree.

BCAR 04 9.8 Bearings, tracks and radials

BCAR 04 9.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in BCAR 04 9.8.2. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g.290° (294.9°T).
(See IEM BCAR 04 9.8.1)

BCAR 04 9.8.2 Reserved

BCAR 04 9.8.3 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.

BCAR 04 9.9 Aeronautical data

BCAR 04 9.9.1 Aerodromes

BCAR 04 9.9.1.1 The aerodrome of departure shall be shown by the runway pattern.

BCAR 04 9.9.1.2 All aerodromes which affect the designated standard departure route — instrument shall be shown and identified. Where appropriate, the aerodrome runway patterns shall be shown.

BCAR 04 9.9.2 Prohibited, restricted and danger areas

Prohibited, restricted and danger areas which may affect the execution of the procedures shall be shown with their identification and vertical limits.

BCAR 04 9.9.3 Minimum sector altitude

BCAR 04 9.9.3.1 The established minimum sector altitude shall be shown with a clear indication of the sector to which it applies.

BCAR 04 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.

(See IEM BCAR 04 9.9.3.2)

BCAR 04 9.9.4 Air traffic services system

BCAR 04 9.9.4.1 The components of the established relevant air traffic services system shall be shown.

BCAR 04 9.9.4.1.1 The components shall comprise the following:

a) a graphic portrayal of each standard departure route — instrument, including:

1) for departure procedures designed specifically for helicopters, the term “CAT H” shall be depicted in the departure chart plan view;

2) route designator;

3) significant points defining the route;

4) track or radial to the nearest degree along each segment of the route;

5) distances to the nearest kilometre or nautical mile between significant points;

6) minimum obstacle clearance altitudes, along the route or route segments and altitudes required by the procedure to the nearest higher 50 m or 100 ft and flight level restrictions where established;

7) where the chart is drawn to scale and vectoring on departure is provided, established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;
(See IEM BCAR 04 9.9.4.1.1(a)(7))

b) the radio navigation aid(s) associated with the route(s) including:

1) when the radio navigation aid is used for conventional navigation:

i) plain language name;
ii) identification;
iii) Morse code;
iv) frequency;
v) geographical coordinates in degrees, minutes and seconds; and
vi) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);

2) when the radio navigation aid is used as a significant point for area navigation:

i) plain language name; and
ii) identification;

c) significant points not marked by the position of a radio navigation aid including:

1) when the significant point is used for conventional navigation:

i) name-code;

ii) geographical coordinates in degrees, minutes and seconds;
iii) bearing to the nearest tenth of a degree from the reference radio navigation aid;
iv) distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference radio navigation aid; and
v) identification of the reference radio navigation aid;

2) when the significant point is used for area navigation:

i) name-code;

d) applicable holding patterns;

e) transition altitude/height to the nearest higher 300 m or 1 000 ft;

f) the position and height of close-in obstacles which penetrate the obstacle identification surface (OIS). A note shall be included whenever close-in obstacles penetrating the OIS exist but which were not considered for the published procedure design gradient;
(See IEM BCAR 04 9.9.4.1.1(f))

g) area speed restrictions, where established;

h) for PBN procedures, a PBN requirements box.
(See IEM BCAR 04 9.9.4.1.1(h))

i) all compulsory and “on-request” reporting points;

j) radio communication procedures, including:

1) call sign(s) of ATS unit(s);

2) frequency and, if applicable, SATVOICE number;

3) transponder setting, where appropriate;

k) an indication of “flyover” significant points.

BCAR 04 9.9.4.2 A textual description of standard departure route(s) — instrument (SID) and relevant communication failure procedures shall be provided and shall, whenever feasible, be shown on the chart or on the same page which contains the chart.

BCAR 04 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, Doc 8168), Volume II, Part III, Section 5, Chapter 2, 2.1, on the verso of the chart or as a separate, properly referenced sheet.
(See IEM BCAR 04 9.9.4.3)

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SUBPART J
STANDARD ARRIVAL CHART—INSTRUMENT (STAR) — ICAO

BCAR 04 10.1 Function

This chart shall provide the flight crew with information to enable it to comply with the designated standard arrival route — instrument from the en-route phase to the approach phase.
(See IEM BCAR 04 10.1)

BCAR 04 10.2 Availability

The Standard Arrival Chart — Instrument (STAR) — ICAO shall be made available wherever a standard arrival route — instrument has been established and cannot be shown with sufficient clarity on the Area Chart.

BCAR 04 10.3 Coverage and scale

BCAR 04 10.3.1 The coverage of the chart shall be sufficient to indicate the points where the en-route phase ends and the approach phase begins.

BCAR 04 10.3.2 The chart shall be drawn to scale.

BCAR 04 10.3.3 If the chart is drawn to scale, a scale-bar shall be shown.

BCAR 04 10.3.4 When the chart is not drawn to scale, the annotation “NOT TO SCALE” shall be shown and the symbol for scale break shall be used on tracks and other aspects of the chart which are too large to be drawn to scale.

BCAR 04 10.4 Projection

BCAR 04 10.4.1 A conformal projection on which a straight line approximates a great circle shall be used.

BCAR 04 10.4.2 When the chart is drawn to scale, parallels and meridians shall be shown at suitable intervals.

BCAR 04 10.4.3 Graduation marks shall be placed at consistent intervals along the neat lines.

BCAR 04 10.5 Identification

The chart shall be identified by the name of the city or town or area which the aerodrome serves, the name of the aerodrome, and the identification of the standard arrival route(s) — instrument as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part I, Section 4, Chapter 2.
(See IEM BCAR 04 10.5)

BCAR 04 10.6 Culture and topography

BCAR 04 10.6.1 Where the chart is drawn to scale, generalized shore lines of all open water areas, large lakes and rivers shall be shown except where they conflict with data more applicable to the function of the chart.

BCAR 04 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.
(See IEM BCAR 04 10.6.2)

BCAR 04 10.7 Magnetic variation

Magnetic variation used in determining the magnetic bearings, tracks and radials shall be shown to the nearest degree.

BCAR 04 10.8 Bearings, tracks and radials

BCAR 04 10.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in BCAR 04 10.8.2. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g. 290° (294.9°T).
(See IEM BCAR 04 10.8.1)

BCAR 04 10.8.2 Reserved

BCAR 04 10.8.3 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.

BCAR 04 10.9 Aeronautical data

BCAR 04 10.9.1 Aerodromes

BCAR 04 10.9.1.1 The aerodrome of landing shall be shown by the runway pattern.

BCAR 04 10.9.1.2 All aerodromes which affect the designated standard arrival route — instrument shall be shown and identified. Where appropriate, the aerodrome runway patterns shall be shown.

BCAR 04 10.9.2 Prohibited, restricted and danger areas

Prohibited, restricted and danger areas which may affect the execution of the procedures shall be shown with their identification and vertical limits.

BCAR 04 10.9.3 Minimum sector altitude

BCAR 04 10.9.3.1 The established minimum sector altitude shall be shown with a clear indication of the sector to which it applies.

BCAR 04 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.
(See IEM BCAR 04 10.9.3.2)

BCAR 04 10.9.4 Air traffic services system

BCAR 04 10.9.4.1 The components of the established relevant air traffic services system shall be shown.

BCAR 04 10.9.4.1.1 The components shall comprise the following:

a) a graphic portrayal of each standard arrival route — instrument, including:

1) route designator;

2) significant points defining the route;

3) track or radial to the nearest degree along each segment of the route;

4) distances to the nearest kilometre or nautical mile between significant points;

5) minimum obstacle clearance altitudes, along the route or route segments and altitudes required by the procedure to the nearest higher 50 m or 100 ft and flight level restrictions where established;

6) where the chart is drawn to scale and vectoring on arrival is provided, established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;
(See IEM BCAR 04 10.9.4.1.1)

b) the radio navigation aid(s) associated with the route(s) including:

1) when the radio navigation aid is used for conventional navigation:

i) plain language name;

ii) identification;

iii) Morse code;

iv) frequency;

v) geographical coordinates in degrees, minutes and seconds; and

vi) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);

2) when the radio navigation aid is used as a significant point for area navigation:

i) plain language name; and

ii) identification;

c) significant points not marked by the position of a radio navigation aid including:

1) when the significant point is used for conventional navigation:

i) name-code;

ii) geographical coordinates in degrees, minutes and seconds;

iii) bearing to the nearest tenth of a degree from the reference radio navigation aid;

iv) distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference radio navigation aid;

v) identification of the reference radio navigation aid;

2) when the significant point is used for area navigation:

i) name-code;

d) applicable holding patterns;

e) transition altitude/height to the nearest higher 300 m or 1 000 ft;

f) area speed restrictions, where established;

g) for PBN procedures, a PBN requirements box;
(See IEM BCAR 04 10.9.4.1.1(g))

h) all compulsory and “on-request” reporting points;

i) radio communication procedures, including:

1) call sign(s) of ATS unit(s);

2) frequency and, if applicable, SATVOICE number;

3) transponder setting, where appropriate;

j) an indication of “flyover” significant waypoints; and

k) for arrival procedures to an instrument approach designed specifically for helicopters, the term “CAT H” shall be depicted in the arrival chart plan view.

BCAR 04 10.9.4.2 A textual description of standard arrival route(s) — instrument (STAR) and relevant communication failure procedures shall be provided and shall, whenever feasible, be shown on the chart or on the same page which contains the chart.

BCAR 04 10.9.4.3 Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the ICAO Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part III, Section 5, Chapter 2, 2.2, on the verso of the chart or as a separate, properly referenced sheet.
(See IEM BCAR 04 10.9.4.3)

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SUBPART K
INSTRUMENT APPROACH CHART — ICAO

BCAR 04 11.1 Function

This chart shall provide flight crews with information which will enable them to perform an approved instrument approach procedure to the runway of intended landing including the missed approach procedure and, where applicable, associated holding patterns.
(See IEM BCAR 04 11.1)

BCAR 04 11.2 Availability

BCAR 04 11.2.1 Instrument Approach Charts — ICAO shall be made available for all aerodromes used by international civil aviation where instrument approach procedures have been established by the Aeronautical Charts service provider.

BCAR 04 11.2.2 A separate Instrument Approach Chart — ICAO shall normally be provided for each precision approach procedure established by the Aeronautical Charts service provider.

BCAR 04 11.2.3 A separate Instrument Approach Chart — ICAO shall normally be provided for each non-precision approach procedure established by the Aeronautical Charts service provider.
(See IEM BCAR 04 11.2.3)

BCAR 04 11.2.4 When the values for track, time or altitude differ between categories of aircraft on other than the final approach segment of the instrument approach procedures and the listing of these differences on a single chart could cause clutter or confusion, more than one chart shall be provided.
(See IEM BCAR 04 11.2.4)

BCAR 04 11.2.5 Instrument Approach Charts — ICAO shall be revised whenever information essential to safe operation becomes out of date.

BCAR 04 11.3 Coverage and scale

BCAR 04 11.3.1 The coverage of the chart shall be sufficient to include all segments of the instrument approach procedure and such additional areas as may be necessary for the type of approach intended.

BCAR 04 11.3.2 The scale selected shall ensure optimum legibility consistent with:

a) the procedure shown on the chart;

b) sheet size.

BCAR 04 11.3.3 A scale indication shall be given.

BCAR 04 11.3.3.1 Except where this is not practicable, a distance circle with a radius of 20 km (10 NM) centred on a DME located on or close to the aerodrome, or on the aerodrome reference point where no suitable DME is available, shall be shown; its radius shall be indicated on the circumference.

BCAR 04 11.3.3.2 A distance scale shall be shown directly below the profile.

BCAR 04 11.4 Format

The sheet size shall be 210 × 148 mm (8.27 × 5.82 in).

BCAR 04 11.5 Projection

BCAR 04 11.5.1 A conformal projection on which a straight line approximates a great circle shall be used.

BCAR 04 11.5.2 Graduation marks shall be placed at consistent intervals along the neat lines.

BCAR 04 11.6 Identification

The chart shall be identified by the name of the city or town or area which the aerodrome serves, the name of the aerodrome and the identification of the instrument approach procedure as established in accordance with the ICAO Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part I, Section 4, Chapter 9.
(See IEM BCAR 04 11.6)

BCAR 04 11.7 Culture and topography

BCAR 04 11.7.1 Culture and topographic information pertinent to the safe execution of the instrument approach procedure, including the missed approach procedure, associated holding procedures and visual manoeuvring (circling) procedure when established, shall be shown. Topographic information shall be named, only when necessary, to facilitate the understanding of such information, and the minimum shall be a delineation of land masses and significant lakes and rivers.

BCAR 04 11.7.2 Relief shall be shown in a manner best suited to the particular elevation characteristics of the area. In areas where relief exceeds 1 200 m (4 000 ft) above the aerodrome elevation within the coverage of the chart or 600 m (2 000 ft) within 11 km (6 NM) of the aerodrome reference point or when final approach or missed approach procedure gradient is steeper than optimal due to terrain, 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, shall also be shown printed in black.
(See IEM BCAR 04 11.7.2)

BCAR 04 11.7.3 In areas where relief is lower than specified in BCAR 04 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, shall also be shown printed in black.
(See IEM BCAR 04 11.7.3)

BCAR 04 11.8 Magnetic variation

BCAR 04 11.8.1 The magnetic variation shall be shown.

BCAR 04 11.8.2 When shown, the value of the variation, indicated to the nearest degree, shall agree with that used in determining magnetic bearings, tracks and radials.

BCAR 04 11.9 Bearings, tracks and radials

BCAR 04 11.9.1 Bearings, tracks and radials shall be magnetic, except as provided for in BCAR 04 11.9.2. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g. 290° (294.9°T).
(See IEM BCAR 04 11.9.1)

BCAR 04 11.9.2 Reserved

BCAR 04 11.9.3 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.

BCAR 04 11.10 Aeronautical data

BCAR 04 11.10.1 Aerodromes

BCAR 04 11.10.1.1 All aerodromes which show a distinctive pattern from the air shall be shown by the appropriate symbol. Abandoned aerodromes shall be identified as abandoned.

BCAR 04 11.10.1.2 The runway pattern, at a scale sufficiently large to show it clearly, shall be shown for:

a) the aerodrome on which the procedure is based;

b) aerodromes affecting the traffic pattern or so situated as to be likely, under adverse weather conditions, to be mistaken for the aerodrome of intended landing.

BCAR 04 11.10.1.3 The aerodrome elevation shall be shown to the nearest metre or foot in a prominent position on the chart.

BCAR 04 11.10.1.4 The threshold elevation or, where applicable, the highest elevation of the touchdown zone shall be shown to the nearest metre or foot.

BCAR 04 11.10.2 Obstacles

BCAR 04 11.10.2.1 Obstacles shall be shown on the plan view of the chart.
(See IEM BCAR 04 11.10.2.1)

BCAR 04 11.10.2.2 If one or more obstacles are the determining factor of an obstacle clearance altitude/height, those obstacles shall be identified.

BCAR 04 11.10.2.3 The elevation of the top of obstacles shall be shown to the nearest (next higher) metre or foot.

BCAR 04 11.10.2.4 The heights of obstacles above a datum other than mean sea level (see BCAR 04 11.10.2.3) shall be shown. When shown, they shall be given in parentheses on the chart.

BCAR 04 11.10.2.5 When the heights of obstacles above a datum other than mean sea level are shown, the datum shall be the aerodrome elevation except that, at aerodromes having an instrument runway (or runways) with a threshold elevation more than 2 m (7 ft) below the aerodrome elevation, the chart datum shall be the threshold elevation of the runway to which the instrument approach is related.

BCAR 04 11.10.2.6 Where a datum other than mean sea level is used, it shall be stated in a prominent position on the chart.

BCAR 04 11.10.2.7 Where an obstacle free zone has not been established for a precision approach runway Category I, this shall be indicated.

BCAR 04 11.10.3 Prohibited, restricted and danger areas

Prohibited areas, restricted areas, and danger areas which may affect the execution of the procedures shall be shown with their identification and vertical limits.

BCAR 04 11.10.4 Radio communication facilities and navigation aids

BCAR 04 11.10.4.1 Radio navigation aids required for the procedures together with their frequencies, identifications and track-defining characteristics, if any, shall be shown. In the case of a procedure in which more than one station is located on the final approach track, the facility to be used for track guidance for final approach shall be clearly identified. In addition, consideration shall be given to the elimination from the approach chart of those facilities that are not used by the procedure.

BCAR 04 11.10.4.1.1 When a radio navigation aid is used as a significant point for area navigation, only its plain language name and identification shall be shown.

BCAR 04 11.10.4.2 The initial approach fix (IAF), the intermediate approach fix (IF), the final approach fix (FAF) (or final approach point (FAP) for an ILS approach procedure), the missed approach point (MAPt), where established, and other essential fixes or points comprising the procedure shall be shown and identified.

BCAR 04 11.10.4.3 The final approach fix (or final approach point for an ILS approach procedure) shall be identified with its geographical coordinates in degrees, minutes and seconds.

BCAR 04 11.10.4.4 Radio navigation aids that might be used in diversionary procedures together with their track-defining characteristics, if any, shall be shown or indicated on the chart.

BCAR 04 11.10.4.5 Radio communication frequencies, including call signs that are required for the execution of the procedures shall be shown.

BCAR 04 11.10.4.6 When required by the procedures, the distance to the aerodrome from each radio navigation aid concerned with the final approach shall be shown to the nearest kilometre or nautical mile. When no track-defining aid indicates the bearing of the aerodrome, the bearing shall also be shown to the nearest degree.

BCAR 04 11.10.5 Minimum sector altitude or terminal arrival altitude

The minimum sector altitude or terminal arrival altitude established by the Procedures Specialist shall be shown, with a clear indication of the sector to which it applies.

BCAR 04 11.10.6 Portrayal of procedure tracks

BCAR 04 11.10.6.1 The plan view shall show the following information in the manner indicated:

a) the approach procedure track by an arrowed continuous line indicating the direction of flight;

b) the missed approach procedure track by an arrowed broken line;

c) any additional procedure track, other than those specified in a) and b), by an arrowed dotted line;

d) bearings, tracks, radials to the nearest degree and distances to the nearest two-tenths of a kilometre or tenth of a nautical mile or times required for the procedure;

e) where no track-defining aid is available, the magnetic bearing to the nearest degree to the aerodrome from the radio navigation aids concerned with the final approach;

f) the boundaries of any sector in which visual manoeuvring (circling) is prohibited;

g) where specified, the holding pattern and minimum holding altitude/height associated with the approach and missed approach;

h) caution notes where required, prominently displayed on the face of the chart;

i) an indication of “flyover” significant points

BCAR 04 11.10.6.2 The plan view shall show the distance to the aerodrome from each radio navigation aid concerned with the final approach.

BCAR 04 11.10.6.3 A profile shall be provided normally below the plan view showing the following data:

a) the aerodrome by a solid block at aerodrome elevation;

b) the profile of the approach procedure segments by an arrowed continuous line indicating the direction of flight;

c) the profile of the missed approach procedure segment by an arrowed broken line and a description of the procedure;

d) the profile of any additional procedure segment, other than those specified in b) and c), by an arrowed dotted line;

e) bearings, tracks, radials to the nearest degree and distances to the nearest two-tenths of a kilometre or tenth of a nautical mile or times required for the procedure;

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

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

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

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

BCAR 04 11.10.6.4 Heights required by procedures shall be shown in parentheses, using the height datum selected in accordance with BCAR 04 11.10.2.5.

BCAR 04 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.

(See IEM BCAR 04 11.10.6.5)

BCAR 04 11.10.7 Aerodrome operating minima

BCAR 04 11.10.7.1 Aerodrome operating minima when established by the Belize Department of Civil Aviation shall be shown.

BCAR 04 11.10.7.2 The obstacle clearance altitudes/heights for the aircraft categories for which the procedure is designed shall be shown; for precision approach procedures, additional OCA/H for Cat D_L aircraft (wing span between 65 m and 80 m and/or vertical distance between the flight path of the wheels and the glide path antenna between 7 m and 8 m) shall be published, when necessary.

BCAR 04 11.10.8 Supplementary information

BCAR 04 11.10.8.1 When the missed approach point is defined by:

— a distance from the final approach fix, or

— a facility or a fix and the corresponding distance from the final approach fix,

the distance to the nearest two-tenths of a kilometre or tenth of a nautical mile and a table showing ground speeds and times from the final approach fix to the missed approach point shall be shown.

BCAR 04 11.10.8.2 When DME is required for use in the final approach segment, a table showing altitudes/heights for each 2 km or 1 NM, as appropriate, shall be shown. The table shall not include distances which would correspond to altitudes/heights below the OCA/H.

BCAR 04 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.

BCAR 04 11.10.8.4 A rate of descent table shall be shown.

BCAR 04 11.10.8.5 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.

BCAR 04 11.10.8.6 For precision approach procedures and approach procedures with vertical guidance, the reference datum height to the nearest half metre or foot and the glide path/elevation/vertical path angle to the nearest one-tenth of a degree shall be shown.

BCAR 04 11.10.8.7 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.

BCAR 04 11.10.8.8 If the final approach descent gradient/angle for any type of instrument approach procedure exceeds the maximum value specified in the ICAO Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, a cautionary note shall be included.

BCAR 04 11.10.8.9 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.

BCAR 04 11.10.8.10 For approach procedures having PBN segments, a PBN requirements box shall be included.
(See IEM BCAR 04 11.10.8.10)

BCAR 04 11.10.9 Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the ICAO Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part III, Section 5, Chapter 2, 2.3, for RNAV procedures and Volume II, Part I, Section 4, Chapter 9, 9.4.1.3, for non-RNAV procedures, on the verso of the chart or as a separate, properly referenced sheet.
(See IEM BCAR 04 11.10.9)

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SUBPART L
VISUAL APPROACH CHART — ICAO

BCAR 04 12.1 Function

This chart shall provide flight crews with information which will enable them to transit from the en-route/descent to approach phases of flight to the runway of intended landing by means of visual reference.

BCAR 04 12.2 Availability

The Visual Approach Chart - ICAO shall be made available in the manner prescribed in BCAR 04 1.3.2 for all aerodromes used by international civil aviation where:

a) only limited navigation facilities are available; or

b) radio communication facilities are not available; or

c) no adequate aeronautical charts of the aerodrome and its surroundings at 1:500 000 or greater scale are available; or

d) visual approach procedures have been established.

BCAR 04 12.3 Scale

BCAR 04 12.3.1 The scale shall be sufficiently large to permit depiction of significant features and indication of the aerodrome layout.

BCAR 04 12.3.2 The scale shall not be smaller than 1:500 000.
(See IEM BCAR 04 12.3.2)

BCAR 04 12.3.3 When an Instrument Approach Chart is available for a given aerodrome, the Visual Approach Chart shall be drawn to the same scale

BCAR 04 12.4 Format

The sheet size shall be 210 × 148 mm (8.27 × 5.82 in).
(See IEM BCAR 04 12.4)

BCAR 04 12.5 Projection

BCAR 04 12.5.1 A conformal projection on which a straight line approximates a great circle shall be used.

BCAR 04 12.5.2 Graduation marks shall be placed at consistent intervals along the neat lines.

BCAR 04 12.6 Identification

The chart shall be identified by the name of the city or town which the aerodrome serves and the name of the aerodrome.

BCAR 04 12.7 Culture and topography

BCAR 04 12.7.1 Natural and cultural landmarks shall be shown (e.g. bluffs, cliffs, sand dunes, cities, towns, roads, railroads, isolated lighthouses).

BCAR 04 12.7.1.1 Geographical place names shall be included only when they are required to avoid confusion or ambiguity.

BCAR 04 12.7.2 Shore lines, lakes, rivers and streams shall be shown.

BCAR 04 12.7.3 Relief shall be shown in a manner best suited to the particular elevation and obstacle characteristics of the area covered by the chart.

BCAR 04 12.7.4 When shown, spot elevations shall be carefully selected.
(See IEM BCAR 04 12.7.4)

BCAR 04 12.7.5 The figures relating to different reference levels shall be clearly differentiated in their presentation.

BCAR 04 12.8 Magnetic variation

The magnetic variation shall be shown.

BCAR 04 12.9 Bearings, tracks and radials

BCAR 04 12.9.1 Bearings, tracks and radials shall be magnetic except as provided for in BCAR 04 12.9.2.

BCAR 04 12.9.2 Reserved

BCAR 04 12.9.3 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.

BCAR 04 12.10 Aeronautical data

BCAR 04 12.10.1 Aerodromes

BCAR 04 12.10.1.1 All aerodromes shall be shown by the runway pattern. Restrictions on the use of any landing direction shall be indicated. Where there is any risk of confusion between two neighbouring aerodromes, this shall be indicated. Abandoned aerodromes shall be identified as abandoned.

BCAR 04 12.10.1.2 The aerodrome elevation shall be shown in a prominent position on the chart.

BCAR 04 12.10.2 Obstacles

BCAR 04 12.10.2.1 Obstacles shall be shown and identified.

BCAR 04 12.10.2.2 The elevation of the top of obstacles shall be shown to the nearest (next higher) metre or foot.

BCAR 04 12.10.2.3 The heights of obstacles above the aerodrome elevation shall be shown.

BCAR 04 12.10.2.3.1 When the heights of obstacles are shown, the height datum shall be stated in a prominent position on the chart and the heights shall be given in parentheses on the chart.

BCAR 04 12.10.3 Prohibited, restricted and danger areas

Prohibited areas, restricted areas, and danger areas shall be depicted with their identification and vertical limits.

BCAR 04 12.10.4 Designated airspace

Where applicable, control zones and aerodrome traffic zones shall be depicted with their vertical limits and the appropriate class of airspace.

BCAR 04 12.10.5 Visual approach information

BCAR 04 12.10.5.1 Visual approach procedures shall be shown where applicable.

BCAR 04 12.10.5.2 Visual aids for navigation shall be shown as appropriate.

BCAR 04 12.10.5.3 Location and type of the visual approach slope indicator systems with their nominal approach slope angle(s), minimum eye height(s) over the threshold of the on-slope signal(s), and where the axis of the system is not parallel to the runway centre line, the angle and direction of displacement, i.e. left or right, shall be shown.

BCAR 04 12.10.6 Supplementary information

BCAR 04 12.10.6.1 Radio navigation aids together with their frequencies and identifications shall be shown as appropriate.

BCAR 04 12.10.6.2 Radio communication facilities with their frequencies shall be shown as appropriate.

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a) geographical coordinates in degrees, minutes and seconds for the aerodrome/heliport reference point;

b) elevations, to the nearest metre or foot, of the aerodrome/heliport and apron (altimeter checkpoint locations) where applicable; and for non-precision approaches, elevations and geoid undulations of runway thresholds and the geometric centre of the touchdown and lift-off area;

c) elevations and geoid undulations, to the nearest half-metre or foot, of the precision approach runway threshold, the geometric centre of the touchdown and lift-off area, and at the highest elevation of the touchdown zone of a precision approach runway;

d) all runways including those under construction with designation number, length and width to the nearest metre, bearing strength, displaced thresholds, stopways, clearways, runway directions to the nearest degree magnetic, type of surface and runway markings;
(See IEM BCAR 04 13.6.1(d))

e) all aprons, with aircraft/helicopter stands, lighting, markings and other visual guidance and control aids, where applicable, including location and type of visual docking guidance systems, type of surface for heliports, and bearing strengths or aircraft type restrictions where the bearing strength is less than that of the associated runways;
(See IEM BCAR 04 13.6.1(e))

f) geographical coordinates in degrees, minutes and seconds for thresholds, geometric centre of touchdown and lift-off area and/or thresholds of the final approach and take-off area (where appropriate);

g) all taxiways, helicopter air and ground taxiways with type of surface, helicopter air transit routes, with designations, width, lighting, markings (including runway-holding positions and, where established, intermediate holding positions), stop bars, other visual guidance and control aids, and bearing strength or aircraft type restrictions where the bearing strength is less than that of the associated runways;
(See IEM BCAR 04 13.6.1(g))

h) where established, hot spot locations with additional information properly annotated;
(See IEM BCAR 04 13.6.1(h))

i) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for appropriate taxiway centre line points and aircraft stands;

j) where established, standard routes for taxiing aircraft with their designators;

k) the boundaries of the air traffic control service;

l) position of runway visual range (RVR) observation sites;

m) approach and runway lighting;

n) location and type of the visual approach slope indicator systems with their nominal approach slope angle(s), minimum eye height(s) over the threshold of the on-slope signal(s), and where the axis of the system is not parallel to the runway centre line, the angle and direction of the displacement, i.e. left or right;

o) relevant communication facilities listed with their channels and, if applicable, logon address and SATVOICE number;

p) obstacles to taxiing;

q) aircraft servicing areas and buildings of operational significance;

r) VOR checkpoint and radio frequency of the aid concerned;

s) any part of the depicted movement area permanently unsuitable for aircraft, clearly identified as such.

BCAR 04 13.6.2 For aerodromes accommodating aeroplanes with folding wing tips, the areas where it is safe for aeroplanes with folding wing tips to operate with wing tips extended, shall be shown on the chart.

BCAR 04 13.6.3 In addition to the items in BCAR 04 13.6.1 relating to heliports, the chart shall show:

a. heliport type;
(See IEM BCAR 04 13.6.3(a))

b) touchdown and lift-off area including dimensions to the nearest metre, slope, type of surface and bearing strength in tonnes;

c) final approach and take-off area including type, true bearing to the nearest degree, designation number (where appropriate), length and width to the nearest metre, slope and type of surface;

d) safety area including length, width and type of surface;

e) helicopter clearway including length and ground profile;

f) obstacles including type and elevation of the top of the obstacles to the nearest (next higher) metre or foot;

g) visual aids for approach procedures, marking and lighting of final approach and take-off area, and of touchdown and lift-off area;

h) declared distances to the nearest metre for heliports, where relevant, including:

1) take-off distance available;

2) rejected take-off distance available;

3) landing distance available.

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SUBPART N

AERODROME GROUND MOVEMENT CHART — ICAO

BCAR 04 14.1 Function

This supplementary chart shall provide flight crews with detailed information to facilitate the ground movement of aircraft to and from the aircraft stands and the parking/docking of aircraft.

BCAR 04 14.2 Availability

The Aerodrome Ground Movement Chart – ICAO shall be made available in the manner prescribed in BCAR 04 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.

BCAR 04 14.3 Coverage and scale

BCAR 04 14.3.1 The coverage and scale shall be sufficiently large to show clearly all the elements listed in BCAR 04 14.6.

BCAR 04 14.3.2 A linear scale shall be shown.

BCAR 04 14.4 Identification

The chart shall be identified by the name of the city or town or area which the aerodrome serves and the name of the aerodrome.

BCAR 04 14.5 Magnetic variation

BCAR 04 14.5.1 A True North arrow shall be shown.

BCAR 04 14.5.2 Magnetic variation to the nearest degree and its annual change shall be shown.
(See IEM BCAR 04 14.5.2)

BCAR 04 14.6 Aerodrome data

BCAR 04 14.6.1 This chart shall show in a similar manner all the information on the Aerodrome/Heliport Chart – ICAO relevant to the area depicted, including:

a) apron elevation to the nearest metre or foot;

b) aprons with aircraft stands, bearing strengths or aircraft type restrictions, lighting, marking and other visual guidance and control aids, where applicable, including location and type of visual docking guidance systems;

c) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for aircraft stands;

d) taxiways with designations, width to the nearest metre, bearing strength or aircraft type restrictions where applicable, lighting, markings (including runway-holding positions and, where established, intermediate holding positions), stop bars, and other visual guidance and control aids;

e) where established, hot spot locations with additional information properly annotated;
(See IEM BCAR 04 14 .6(e))

f) where established, standard routes for taxiing aircraft, with their designators;

g) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for appropriate taxiway centre line points;

h) the boundaries of the air traffic control service;

i) relevant communication facilities listed with their channels and, if applicable, logon address;

j) obstacles to taxiing;

k) aircraft servicing areas and buildings of operational significance;

l) VOR checkpoint and radio frequency of the aid concerned;

m) any part of the depicted movement area permanently unsuitable for aircraft, clearly identified as such.

BCAR 04 14.6.2 For aerodromes accommodating aeroplanes with folding wing tips, the areas where it is safe for aeroplanes with folding wing tips to operate with wing tips extended, shall be shown on the chart.

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SUBPART O
AIRCRAFT PARKING/DOCKING CHART - ICAO

BCAR 04 15.1 Function

This supplementary chart shall provide flight crews with detailed information to facilitate the ground movement of aircraft between the taxiways and the aircraft stands and the parking/docking of aircraft.

BCAR 04 15.2 Availability

The Aircraft Parking/Docking Chart - ICAO shall be made available in the manner prescribed in BCAR 04 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.

BCAR 04 15.3 Coverage and scale

BCAR 04 15.3.1 The coverage and scale shall be sufficiently large to show clearly all the elements listed in BCAR 04 15.6.

BCAR 04 15.3.2 A linear scale shall be shown.

BCAR 04 15.4 Identification

The chart shall be identified by the name of the city or town or area which the aerodrome serves and the name of the aerodrome.

BCAR 04 15.5 Magnetic variation

BCAR 04 15.5.1 A True North arrow shall be shown.

BCAR 04 15.5.2 Magnetic variation to the nearest degree and its annual change shall be shown.
(See IEM BCAR 04 15 .5.2)

BCAR 04 15.6 Aerodrome data

This chart shall show in a similar manner all the information on the Aerodrome/Heliport Chart – ICAO and the Aerodrome Ground Movement Chart – ICAO relevant to the area depicted, including:

a) apron elevation to the nearest metre or foot;

b) aprons with aircraft stands, bearing strengths or aircraft type restrictions, lighting, marking and other visual guidance and control aids, where applicable, including location and type of visual docking guidance systems;

c) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for aircraft stands;

d) taxiway entries with designations, including runway-holding positions and, where established, intermediate holding positions, and stop bars;

e) where established, hot spot locations with additional information properly annotated;
(See IEM BCAR 04 15 .6(e))

f) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for appropriate taxiway centre line points;

g) the boundaries of the air traffic control service;

h) relevant communication facilities listed with their channels and, if applicable, logon address;

i) obstacles to taxiing;

j) aircraft servicing areas and buildings of operational significance;

k) VOR checkpoint and radio frequency of the aid concerned;

l) any part of the depicted movement area permanently unsuitable for aircraft, clearly identified as such.

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SUBPART P
WORLD AERONAUTICAL CHART - ICAO 1:1 000 000

BCAR 04 16.1 Function

This chart shall provide information to satisfy the requirements of visual air navigation.
(See IEM BCAR 04 16.1)

BCAR 04 16.2 Availability

BCAR 04 16.2.1 The World Aeronautical Chart — ICAO 1:1 000 000 shall be made available in the manner prescribed in BCAR 04 1.3.2 for all areas delineated in Appendix 5.
(See IEM BCAR 04 16.2.1)

BCAR 04 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.

BCAR 04 16.3 Scales

BCAR 04 16.3.1 Linear scales for kilometres and nautical miles arranged in the following order:

— kilometres,

— nautical miles,

with their zero points in the same vertical line shall be shown in the margin.

BCAR 04 16.3.1.1 The length of the linear scales shall represent at least 200 km (110 NM).

BCAR 04 16.3.2 A conversion scale (metres/feet) shall be shown in the margin.

BCAR 04 16.4 Format

BCAR 04 16.4.1 The title and marginal notes shall be in one of the working languages of ICAO.
(See IEM BCAR 04 16.4.1)

BCAR 04 16.4.2 The information regarding the number of the adjoining sheets and the unit of measurement to express elevations shall be so located as to be clearly visible when the sheet is folded.

BCAR 04 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 part of the chart face upward. Fold inward near the meridian, and fold both halves backward in accordion folds.

BCAR 04 16.4.4 Whenever practicable, the sheet lines shall conform with those shown in the index in Appendix 5.
(See IEM BCAR 04 16.4.4)

BCAR 04 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 shall 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.

BCAR 04 16.5 Projection

BCAR 04 16.5.1 The projections shall be as follows:

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

b) between 80° and 90° latitude: the Polar stereographic projection with scale matching that of the Lambert conformal conic projection at latitude 80°, except that in the northern hemisphere the Lambert conformal conic projection may be used between 80° and 84° latitude and the Polar stereographic projection between 84° and 90° with the scales matching at 84° North.

BCAR 04 16.5.2 Graticules and graduations shall be shown as follows:

a) Parallels:

Latitude	*Distance between parallels*	*Graduations on parallels*
0° to 72°	30′	1′
72° to 84°	30′	5′
84° to 89°	30′	1°
89° to 90°	30′	5° (Only on degree parallels from 72° to 89°)

b) Meridians:

Latitude	*Interval between meridians*	*Graduations on meridians*
0° to 52°	30′	1′
52° to 72°	30′	1′ (Only on even numbered meridians)
72° to 84°	1°	1′
84° to 89°	5°	1′
89° to 90°	15°	1′ (Only on every fourth meridian)

BCAR 04 16.5.3 The graduation marks at 1′ and 5′ intervals shall extend away from the Greenwich Meridian and from the Equator. Each 10′ interval shall be shown by a mark on both sides of the graticule line.

BCAR 04 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.

BCAR 04 16.5.4 All meridians and parallels shown shall be numbered in the borders of the chart. In addition, each parallel shall be numbered within the body of the chart in such a manner that the parallel can be readily identified when the chart is folded.
(See IEM BCAR 04 16.5.4)

BCAR 04 16.5.5 The name and basic parameters of the projection shall be indicated in the margin.

BCAR 04 16.6 Identification

Sheet numbering shall be in conformity with the index in Appendix 5.
(See IEM BCAR 04 16.6)

BCAR 04 16.7 Culture and topography

BCAR 04 16.7.1 Built-up areas

BCAR 04 16.7.1.1 Cities, towns and villages shall be selected and shown according to their relative importance to visual air navigation.

BCAR 04 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.

BCAR 04 16.7.2 Railroads

BCAR 04 16.7.2.1 All railroads having landmark value shall be shown.
(See IEM BCAR 04 16.7.2.1)

BCAR 04 16.7.2.2 Important tunnels shall be shown.
(See IEM BCAR 04 16.7.2.2)

BCAR 04 16.7.3 Highways and roads

BCAR 04 16.7.3.1 Road systems shall be shown in sufficient detail to indicate significant patterns from the air.

BCAR 04 16.7.3.2 Roads shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.
(See IEM BCAR 04 16.7.3.2)

BCAR 04 16.7.4 Landmarks

Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, 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.
(See IEM BCAR 04 16.7.4)

BCAR 04 16.7.5 Political boundaries

International boundaries shall be shown. Undemarcated and undefined boundaries shall be distinguished by descriptive notes.

BCAR 04 16.7.6 Hydrography

BCAR 04 16.7.6.1 All water features compatible with the scale of the chart comprising shore lines, lakes, rivers and streams (including those non-perennial in nature), salt lakes, glaciers and ice caps shall be shown.

BCAR 04 16.7.6.2 The tint covering large open water areas shall be kept very light.
(See IEM BCAR 04 16.7.6.2)

BCAR 04 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.
(See IEM BCAR 04 16.7.6.3)

BCAR 04 16.7.7 Contours

BCAR 04 16.7.7.1 Contours shall be shown. The selection of intervals shall be governed by the requirement to depict clearly the relief features required in air navigation.

BCAR 04 16.7.7.2 The values of the contours used shall be shown.

BCAR 04 16.7.8 Hypsometric tints

BCAR 04 16.7.8.1 When hypsometric tints are used, the range of elevations for the tints shall be shown.

BCAR 04 16.7.8.2 The scale of the hypsometric tints used on the chart shall be shown in the margin.

BCAR 04 16.7.9 Spot elevations

BCAR 04 16.7.9.1 Spot elevations shall be shown at selected critical points. The elevations selected shall always be the highest in the immediate vicinity and shall generally indicate the top of a peak, ridge, etc. Elevations in valleys and at lake surface levels which are of special value to the aviator shall be shown. The position of each selected elevation shall be indicated by a dot.

BCAR 04 16.7.9.2 The elevation (in metres or feet) of the highest point on the chart and its geographical position to the nearest five minutes shall be indicated in the margin.

BCAR 04 16.7.9.3 The spot elevation of the highest point in any sheet shall be cleared of hypsometric tinting.

BCAR 04 16.7.10 Incomplete or unreliable relief

BCAR 04 16.7.10.1 Areas that have not been surveyed for contour information shall be labelled “Relief data incomplete”.

BCAR 04 16.7.10.2 Charts on which spot elevations are generally unreliable shall bear a warning note prominently displayed on the face of the chart in the colour used for aeronautical information, as follows:
“Warning - The reliability of relief information on this chart is doubtful and elevations shall be used with caution.”

BCAR 04 16.7.11 Escarpments

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

BCAR 04 16.7.12 Wooded areas

BCAR 04 16.7.12.1 Wooded areas shall be shown.
(See IEM BCAR 04 16.7.12.1)

BCAR 04 16.7.12.2 Where shown, the approximate extreme northern or southern limits of tree growth shall be indicated by a dashed black line and shall be appropriately labelled.

BCAR 04 16.7.13 Date of topographic information

The date of latest information shown on the topographic base shall be indicated in the margin.

BCAR 04 16.8 Magnetic variation

BCAR 04 16.8.1 Isogonic lines shall be shown.

BCAR 04 16.8.2 The date of the isogonic information shall be indicated in the margin.

BCAR 04 16.9 Aeronautical data

BCAR 04 16.9.1 General

Aeronautical data shown shall be kept to a minimum consistent with the use of the chart for visual navigation and the revision cycle (see BCAR 04 16.9.6).

BCAR 04 16.9.2 Aerodromes

BCAR 04 16.9.2.1 Land and water aerodromes and heliports shall be shown with their names, to the extent that they do not produce undesirable congestion on the chart, priority being given to those of greatest aeronautical significance.

BCAR 04 16.9.2.2 The aerodrome elevation, the lighting available, the type of runway surface and the length of the longest runway or channel, shown in abbreviated form for each aerodrome in conformity with the example given in Appendix 2, provided they do not cause undesirable clutter on the chart, shall be indicated.

BCAR 04 16.9.2.3 Abandoned aerodromes which are still recognizable as aerodromes from the air shall be shown and identified as abandoned.

BCAR 04 16.9.3 Obstacles

BCAR 04 16.9.3.1 Obstacles shall be shown.
(See IEM BCAR 04 16.9.3.1)

BCAR 04 16.9.3.2 When considered of importance to visual flight, prominent transmission lines, permanent cable car installations and wind turbines, which are obstacles, shall be shown.

BCAR 04 16.9.4 Prohibited, restricted and danger areas

Prohibited, restricted and danger areas shall be shown.

BCAR 04 16.9.5 Air traffic services system

BCAR 04 16.9.5.1 Significant elements of the air traffic services system including, where practicable, control zones, aerodrome traffic zones, control areas, flight information regions and other airspaces in which VFR flights operate shall be shown together with the appropriate class of airspace.

BCAR 04 16.9.5.2 Where appropriate, the air defence identification zone (ADIZ) shall be shown and properly identified.

(See IEM BCAR 04 16.9.5.2)

BCAR 04 16.9.6 Radio Navigation aids

Radio navigation aids shall be shown by the appropriate symbol and named, but excluding their frequencies, coded designators, times of operation and other characteristics unless any or all of this information which is shown is kept up to date by means of new editions of the chart.

BCAR 04 16.9.7 Supplementary information

BCAR 04 16.9.7.1 Aeronautical ground lights together with their characteristics or their identifications or both shall be shown.

BCAR 04 16.9.7.2 Marine lights on outer prominent coastal or isolated features of not less than 28 km (15 NM) visibility range shall be shown:

a) where they are not less distinguishable than more powerful marine lights in the vicinity;

b) where they are readily distinguishable from other marine or other types of lights in the vicinity of built-up coastal areas;

c) where they are the only lights of significance available.

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SUBPART Q
AERONAUTICAL CHART — ICAO 1:500 000

BCAR 04 17.1 Function

This chart shall provide information to satisfy the requirements of visual air navigation for low speed, short- or medium-range operations at low and intermediate altitudes.
(See IEM BCAR 04 17.1)

BCAR 04 17.2 Availability

The Aeronautical Chart — ICAO 1:500 000 shall be made available in the manner prescribed in BCAR 04 1.3.2 for all areas delineated in Appendix 5.
(See IEM BCAR 04 17.2)

BCAR 04 17.3 Scales

BCAR 04 17.3.1 Linear scales for kilometres and nautical miles arranged in the following order:

— kilometres,

— nautical miles,

with their zero points in the same vertical line shall be shown in the margin.

BCAR 04 17.3.1.1 The length of the linear scale shall be not less than 200 mm (8 in).

BCAR 04 17.3.2 A conversion scale (metres/feet) shall be shown in the margin.

BCAR 04 17.4 Format

BCAR 04 17.4.1 The title and marginal notes shall be in one of the working languages of ICAO.
(See IEM BCAR 04 17.4.1)

BCAR 04 17.4.2 The information regarding the number of the adjoining sheets and the unit of measurement used to express elevation shall be so located as to be clearly visible when the sheet is folded.

BCAR 04 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 inward near the meridian, and fold both halves backward in accordion folds.

BCAR 04 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.
(See IEM BCAR 04 17.4.4)

BCAR 04 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 shall contain all aeronautical, topographical, hydrographical and cultural information. The overlap shall 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.

BCAR 04 17.5 Projection

BCAR 04 17.5.1 A conformal (orthomorphic) projection shall be used.

BCAR 04 17.5.2 The projection of the World Aeronautical Chart — ICAO 1:1 000 000 shall be determined by regional agreement.

BCAR 04 17.5.3 Parallels shall be shown at intervals of 30′.

BCAR 04 17.5.3.1 Meridians shall normally be shown at intervals of 30′.
(See IEM BCAR 04 17.5.3.1)

BCAR 04 17.5.4 Graduation marks shall be shown at 1′ intervals along each whole degree meridian and parallel, extending away from the Greenwich Meridian and from the Equator. Each 10′ interval shall be shown by a mark on both sides of the graticule line.

BCAR 04 17.5.4.1 The length of the graduation marks shall be approximately 1.3 mm (0.05 in) for the1′ 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.

BCAR 04 17.5.5 All meridians and parallels shown shall be numbered in the borders of the chart.

BCAR 04 17.5.5.1 Each meridian and parallel shall be numbered within the body of the chart whenever this data is required operationally.

BCAR 04 17.5.6 The name and basic parameters of the projection shall be indicated in the margin.

BCAR 04 17.6 Identification

BCAR 04 17.6.1 Each sheet shall be identified by a name which shall be that of the principal town or of a main geographical feature appearing on the sheet.

BCAR 04 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:

Letter	Chart quadrant
A	North-West
B	North-East
C	South-East
D	South-West

BCAR 04 17.7 Culture and topography

BCAR 04 17.7.1 Built-up areas

BCAR 04 17.7.1.1 Cities, towns and villages shall be selected and shown according to their relative importance to visual air navigation.

BCAR 04 17.7.1.2 Cities and towns of sufficient size shall be indicated by the outline of their built-up areas and not of their established city limits.

BCAR 04 17.7.2 Railroads

BCAR 04 17.7.2.1 All railroads having landmark value shall be shown.
(See IEM BCAR 04 17.7.2.1)

BCAR 04 17.7.2.2 Tunnels shall be shown when they serve as prominent landmarks.
(See IEM BCAR 04 17.7.2.2)

BCAR 04 17.7.3 Highways and roads

BCAR 04 17.7.3.1 Road systems shall be shown in sufficient detail to indicate significant patterns from the air.
(See IEM BCAR 04 17.7.3.1)

BCAR 04 17.7.3.2 Roads shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.
(See IEM BCAR 04 17.7.3.2)

BCAR 04 17.7.4 Landmarks

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.
(See IEM BCAR 04 17.7.4)

BCAR 04 17.7.5 Political boundaries

International boundaries shall be shown. Undemarcated and undefined boundaries shall be distinguished by descriptive notes.
(See IEM BCAR 04 17.7.5)

BCAR 04 17.7.6 Hydrography

BCAR 04 17.7.6.1 All water features compatible with the scale of the chart comprising shore lines, lakes, rivers and streams (including those non-perennial in nature), shall be shown.

BCAR 04 17.7.6.2 The tint covering large open water areas shall be kept very light.
(See IEM BCAR 04 17.7.6.2)

BCAR 04 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.
(See IEM BCAR 04 17.7.6.3)

BCAR 04 17.7.7 Contours

BCAR 04 17.7.7.1 Contours shall be shown. The selection of intervals shall be governed by the requirement to depict clearly the relief features required in air navigation.

BCAR 04 17.7.7.2 The values of the contours used shall be shown.

BCAR 04 17.7.8 Hypsometric tints

BCAR 04 17.7.8.1 When hypsometric tints are used, the range of elevations for the tints shall be shown.

BCAR 04 17.7.8.2 The scale of the hypsometric tints used on the chart shall be shown in the margin.

BCAR 04 17.7.9 Spot elevations

BCAR 04 17.7.9.1 Spot elevations shall be shown at selected critical points. The elevations selected shall always be the highest in the immediate vicinity and shall generally indicate the top of a peak, ridge, etc. Elevations in valleys and at lake surface levels which are of navigational value shall be shown. The position of each selected elevation shall be indicated by a dot.

BCAR 04 17.7.9.2 The elevation (in metres or feet) of the highest point on the chart and its geographical position to the nearest five minutes shall be indicated in the margin.

BCAR 04 17.7.9.3 The spot elevation of the highest point on any sheet shall be cleared of hypsometric tinting.

BCAR 04 17.7.10 Incomplete or unreliable relief

BCAR 04 17.7.10.1 Areas that have not been surveyed for contour information shall be labelled “Relief data incomplete”.

BCAR 04 17.7.10.2 Charts on which spot elevations are generally unreliable shall bear a warning note prominently displayed on the face of the chart in the colour used for aeronautical information, as follows:

> “Warning — The reliability of relief information on this chart is doubtful and elevations shall be used with caution.”

BCAR 04 17.7.11 Escarpments

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

BCAR 04 17.7.12 Wooded areas

BCAR 04 17.7.12.1 Wooded areas shall be shown.
(See IEM BCAR 04 17.7.12.1)

BCAR 04 17.7.12.2 Where shown, the approximate northern or southern limits of tree growth shall be indicated by a dashed black line and shall be appropriately labelled.

BCAR 04 17.7.13 Date of topographic information

The date of latest information shown on the topographic base shall be indicated in the margin.

BCAR 04 17.8 Magnetic variation

BCAR 04 17.8.1 Isogonic lines shall be shown.

BCAR 04 17.8.2 The date of the isogonic information shall be indicated in the margin.

BCAR 04 17.9 Aeronautical data

BCAR 04 17.9.1 General

Aeronautical information shall be shown consistent with the use of the chart and the revision cycle.

BCAR 04 17.9.2 Aerodromes

BCAR 04 17.9.2.1 Land and water aerodromes and heliports shall be shown with their names, to the extent that they do not produce undesirable congestion on the chart, priority being given to those of greatest aeronautical significance.

BCAR 04 17.9.2.2 The aerodrome elevation, the lighting available, the type of runway surface and the length of the longest runway or channel, shown in abbreviated form for each aerodrome in conformity with the example given in Appendix 2, provided they do not cause undesirable clutter on the chart, shall be indicated.

BCAR 04 17.9.2.3 Abandoned aerodromes which are still recognizable as aerodromes from the air shall be shown and identified as abandoned.

BCAR 04 17.9.3 Obstacles

BCAR 04 17.9.3.1 Obstacles shall be shown.
(See IEM BCAR 04 17.9.3.1)

BCAR 04 17.9.3.2 When considered of importance to visual flight, prominent transmission lines, permanent cable car installations and wind turbines, which are obstacles, shall be shown.

BCAR 04 17.9.4 Prohibited, restricted and danger areas

Prohibited, restricted and danger areas shall be shown.

BCAR 04 17.9.5 Air traffic services system

BCAR 04 17.9.5.1 Significant elements of the air traffic services system including, where practicable, control zones, aerodrome traffic zones, control areas, flight information regions and other airspaces in which VFR flights operate shall be shown together with the appropriate class of airspace.

BCAR 04 17.9.5.2 Where appropriate, the air defence identification zone (ADIZ) shall be shown and properly identified.
(See IEM BCAR 04 17.9.5.2)

BCAR 04 17.9.6 Radio navigation aids

Radio navigation aids shall be shown by the appropriate symbol and named, but excluding their frequencies, coded designators, times of operation and other characteristics unless any or all of this information which is shown is kept up to date by means of new editions of the chart.

BCAR 04 17.9.7 Supplementary information

BCAR 04 17.9.7.1 Aeronautical ground lights together with their characteristics or their identifications or both shall be shown.

BCAR 04 17.9.7.2 Marine lights on outer prominent coastal or isolated features of not less than 28 km (15 NM) visibility range shall be shown:

a) where they are not less distinguishable than more powerful marine lights in the vicinity;

b) where they are readily distinguishable from other marine or other types of lights in the vicinity of built-up coastal areas;

c) where they are the only lights of significance available.

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SUBPART R
AERONAUTICAL NAVIGATION CHART- ICAO SMALL SCALE

BCAR 04 18.1 Function

This chart shall:

a) serve as an air navigation aid for flight crews of long-range aircraft at high altitudes;

b) provide selective checkpoints over extensive ranges for identification at high altitudes and speeds, which are required for visual confirmation of position;

c) provide for continuous visual reference to the ground during long-range flights over areas lacking radio or other electronic navigation aids, or over areas where visual navigation is preferred or becomes necessary;

d) provide a general purpose chart series for long-range flight planning and plotting.

BCAR 04 18.2 Availability

The Aeronautical Navigation Chart — ICAO Small Scale shall be made available in the manner prescribed in BCAR 04 1.3.2 for all areas delineated in Appendix 5.
(See IEM BCAR 04 18.2)

BCAR 04 18.3 Coverage and scale

BCAR 04 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.
(See IEM BCAR 04 18.3.1)

BCAR 04 18.3.2 The scale shall be in the range of 1:2 000 000 to 1:5 000 000.

BCAR 04 18.3.3 The scale of the chart shall be substituted in the title for the words “Small Scale”.

BCAR 04 18.3.4 Linear scales for kilometres and nautical miles arranged in the following order:

— kilometres,

— nautical miles,

with their zero points in the same vertical line shall be shown in the margin.

BCAR 04 18.3.5 The length of the linear scale shall be not less than 200 mm (8 in).

BCAR 04 18.3.6 A conversion scale (metres/feet) shall be shown in the margin.

BCAR 04 18.4 Format

BCAR 04 18.4.1 The title and marginal notes shall be in one of the working languages of ICAO.
(See IEM BCAR 04 18.4.1)

BCAR 04 18.4.2 The information regarding the number of the adjoining sheets and the unit of measurement to express elevations shall be so located as to be clearly visible when the sheet is folded.

(See IEM BCAR 04 18.4.2)

BCAR 04 18.5 Projection

BCAR 04 18.5.1 A conformal (orthomorphic) projection shall be used.

BCAR 04 18.5.1.1 The name and basic parameters of the projection shall be shown in the margin.

BCAR 04 18.5.2 Parallels shall be shown at intervals of 1°.

BCAR 04 18.5.2.1 Graduations on the parallels shall be shown at sufficiently close intervals compatible with the latitude and the scale of the chart.

BCAR 04 18.5.3 Meridians shall be shown at intervals compatible with the latitude and the scale of the chart.

BCAR 04 18.5.3.1 Graduations on the meridians shall be shown at intervals not exceeding 5′.

BCAR 04 18.5.4 The graduation marks shall extend away from the Greenwich Meridian and from the Equator.

BCAR 04 18.5.5 All meridians and parallels shown shall be numbered in the borders of the chart. In addition, when required, meridians and parallels shall be numbered within the body of the chart in such a manner that they can be readily identified when the chart is folded.

BCAR 04 18.6 Culture and topography

BCAR 04 18.6.1 Built-up areas

BCAR 04 18.6.1.1 Cities, towns and villages shall be selected and shown according to their relative importance to visual air navigation.

BCAR 04 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.

BCAR 04 18.6.2 Railroads

BCAR 04 18.6.2.1 All railroads having landmark value shall be shown.
(See IEM BCAR 04 18.6.2.1)

BCAR 04 18.6.2.2 Important tunnels shall be shown.
(See IEM BCAR 04 18.6.2.2)

BCAR 04 18.6.3 Highways and roads

BCAR 04 18.6.3.1 Road systems shall be shown in sufficient detail to indicate significant patterns from the air.

BCAR 04 18.6.3.2 Roads shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.

BCAR 04 18.6.4 Landmarks

Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, mine structures, 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.

(See IEM BCAR 04 18.6.4)

BCAR 04 18.6.5 Political boundaries

International boundaries shall be shown. Undemarcated and undefined boundaries shall be distinguished by descriptive notes.

BCAR 04 18.6.6 Hydrography

BCAR 04 18.6.6.1 All water features compatible with the scale of the chart comprising shore lines, lakes, rivers and streams (including those non-perennial in nature), shall be shown.

BCAR 04 18.6.6.2 The tint covering large open water areas shall be kept very light.
(See IEM BCAR 04 18.6.6.2)

BCAR 04 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.

BCAR 04 18.6.7 Contours

BCAR 04 18.6.7.1 Contours shall be shown. The selection of intervals shall be governed by the requirement to depict clearly the relief features required in air navigation.

BCAR 04 18.6.7.2 The values of the contours used shall be shown.

BCAR 04 18.6.8 Hypsometric tints

BCAR 04 18.6.8.1 When hypsometric tints are used, the range of elevations for the tints shall be shown.

BCAR 04 18.6.8.2 The scale of the hypsometric tints used on the chart shall be shown in the margin.

BCAR 04 18.6.9 Spot elevations

BCAR 04 18.6.9.1 Spot elevations shall be shown at selected critical points. The elevations selected shall always be the highest in the immediate vicinity and shall generally indicate the top of a peak, ridge, etc. Elevations in valleys and at lake surface levels which are of value to visual air navigation shall be shown. The position of each selected elevation shall be indicated by a dot.

BCAR 04 18.6.9.2 The elevation (in metres or feet) of the highest point on the chart and its geographical position to the nearest five minutes shall be indicated in the margin.

BCAR 04 18.6.9.3 The spot elevation of the highest point in any sheet shall be cleared of hypsometric tinting.

BCAR 04 18.6.10 Incomplete or unreliable relief

BCAR 04 18.6.10.1 Areas that have not been surveyed for contour information shall be labelled “Relief data incomplete”.

BCAR 04 18.6.10.2 Charts on which spot elevations are generally unreliable shall bear a warning note prominently displayed on the face of the chart in the colour used for aeronautical information, as follows:

"Warning — The reliability of relief information on this chart is doubtful and elevations shall be used with caution."

BCAR 04 18.6.11 Escarpments

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

BCAR 04 18.6.12 Wooded areas

Wooded areas of large extent shall be shown.

BCAR 04 18.6.13 Date of topographic information

The date of latest information shown on the topographic base shall be indicated in the margin.

BCAR 04 18.6.14 Colours

BCAR 04 18.6.14.1 Subdued colours shall be used for the chart background to facilitate plotting.

BCAR 04 18.6.14.2 Good colour contrast shall be ensured to emphasize features important to visual air navigation.

BCAR 04 18.7 Magnetic variation

BCAR 04 18.7.1 Isogonic lines shall be shown.

BCAR 04 18.7.2 The date of isogonic information shall be indicated in the margin.

BCAR 04 18.8 Aeronautical data

BCAR 04 18.8.1 Aerodromes

Land and water aerodromes and heliports shall be shown with their names, to the extent that they do not produce undesirable congestion on the chart, priority being given to those of greatest aeronautical significance.

BCAR 04 18.8.2 Obstacles

Obstacles shall be shown.

BCAR 04 18.8.3 Prohibited, restricted and danger areas

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

BCAR 04 18.8.4 Air traffic services system

BCAR 04 18.8.4.1 Significant elements of the air traffic services system shall be shown when considered to be of importance to air navigation.

BCAR 04 18.8.4.2 Where appropriate, the air defence identification zone (ADIZ) shall be shown and properly identified.
(See IEM BCAR 04 18.8.4.2)

BCAR 04 18.8.5 Radio navigation aids

(See IEM BCAR 04 18.8.5)

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SUBPART S
PLOTTING CHART — ICAO

BCAR 04 19.1 Function

This chart shall provide a means of maintaining a continuous flight record of the aircraft position by various fixing methods and dead reckoning in order to maintain an intended flight path.

BCAR 04 19.2 Availability

This chart shall be made available, in the manner prescribed in BCAR 04 1.3.2, to cover major air routes over oceanic areas and sparsely settled areas used by international civil aviation.
(See IEM BCAR 04 19.2)

BCAR 04 19.3 Coverage and scale

BCAR 04 19.3.1 Where practicable, the chart for a particular region shall cover major air routes and their terminals on a single sheet.

BCAR 04 19.3.2 The scale shall be governed by the area to be covered.
(See IEM BCAR 04 19.3.2)

BCAR 04 19.4 Format

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

BCAR 04 19.5 Projection

BCAR 04 19.5.1 A conformal projection on which a straight line approximates a great circle shall be used.

BCAR 04 19.5.2 Parallels and meridians shall be shown.

BCAR 04 19.5.2.1 The intervals shall be arranged to permit accurate plotting to be carried out with a minimum of time and effort.

BCAR 04 19.5.2.2 Graduation marks shall be shown at consistent intervals along an appropriate number of parallels and meridians. The interval selected shall, regardless of scale, minimize the amount of interpolation required for accurate plotting.

BCAR 04 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.

BCAR 04 19.5.2.4 If a navigational grid is shown on charts covering the higher latitudes, it shall comprise lines parallel to the Meridian or anti-Meridian of Greenwich.

BCAR 04 19.6 Identification

Each sheet shall be identified by chart series and number.

BCAR 04 19.7 Culture and topography

BCAR 04 19.7.1 Generalized shore lines of all open water areas, large lakes and rivers shall be shown.

BCAR 04 19.7.2 Spot elevations for selected features constituting a hazard to air navigation shall be shown.

BCAR 04 19.7.3 Particularly hazardous or prominent relief features shall be emphasized.
(See IEM BCAR 04 19.7.3)

BCAR 04 19.8 Magnetic variation

BCAR 04 19.8.1 Isogonals or, in higher latitudes, isogrivs, or both, shall be shown at consistent intervals throughout the chart. The interval selected shall, regardless of scale, minimize the amount of interpolation required.

BCAR 04 19.8.2 The date of the isogonic information shall be shown.

BCAR 04 19.9 Aeronautical data

BCAR 04 19.9.1 The following aeronautical data shall be shown:

a) aerodromes regularly used by international commercial air transport together with their names;

b) selected radio aids to navigation that will contribute to position-finding together with their names and identifications;

c) lattices of long-range electronic aids to navigation, as required;

d) boundaries of flight information regions, control areas and control zones necessary to the function of the chart;

e) designated reporting points necessary to the function of the chart;

f) ocean station vessels

(See IEM BCAR 04 19.9.1)

BCAR 04 19.9.2 Aeronautical ground lights and marine lights useful for air navigation shall be shown where other means of navigation are non-existent.

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SUBPART T
ELECTRONIC AERONAUTICAL CHART DISPLAY — ICAO

BCAR 04 20.1 Function

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

BCAR 04 20.2 Information available for display

BCAR 04 20.2.1 The Electronic Aeronautical Chart Display — ICAO shall be capable of displaying all aeronautical, cultural and topographic information required by BCAR 04 Subpart E and Subparts G through S.

BCAR 04 20.2.2 The Electronic Aeronautical Chart Display — ICAO shall be capable of displaying all aeronautical, cultural and topographic information recommended by BCAR 04 Subpart E and Subparts G through S.
(See IEM BCAR 04 20.2.2)

BCAR 04 20.3 Display requirements

BCAR 04 20.3.1 Display categories

BCAR 04 20.3.1.1 Information available for display shall be subdivided into the following categories:

a) basic display information, permanently retained on the display and consisting of the minimum information essential for the safe conduct of flight; and

b) other display information, which may be removed from the display or displayed individually on demand, and consisting of information not considered essential for the safe conduct of flight.

BCAR 04 20.3.1.2 It shall be a simple function to add or remove other display information but shall not be possible to remove information contained in the basic display.

BCAR 04 20.3.2 Display mode and generation of neighbouring area

BCAR 04 20.3.2.1 The Electronic Aeronautical Chart Display — ICAO shall be capable of continuously plotting the aircraft's position in a true motion mode where reset and generation of the surrounding area shall take place automatically.
(See IEM BCAR 04 20.3.2.1)

BCAR 04 20.3.2.2 It shall be possible manually to change the chart area and the position of the aircraft relative to the edge of the display.

BCAR 04 20.3.3 Scale

It shall be possible to vary the scale at which a chart is displayed.

BCAR 04 20.3.4 Symbols

Symbols used shall conform to those specified for electronic charts in Appendix 2 — ICAO Chart Symbols except where it is desired to show items for which no ICAO chart symbol is provided. In these cases, electronic chart symbols shall be chosen which:

a) employ a minimum use of lines, arcs and area fills;

b) do not cause confusion with any existing aeronautical chart symbol;

c) do not impair the legibility of the display.

(See IEM BCAR 04 20.3.4)

BCAR 04 20.3.5 Display hardware

BCAR 04 20.3.5.1 The effective size of the chart presentation shall be sufficient to display the information required by BCAR 04 20.2 without excessive scrolling.

BCAR 04 20.3.5.2 The display shall have the capabilities required to accurately portray required elements of BCAR 04 Appendix 2 — ICAO Chart Symbols.

BCAR 04 20.3.5.3 The method of presentation shall ensure that the displayed information is clearly visible to the observer in the conditions of natural and artificial light experienced in the cockpit.

BCAR 04 20.3.5.4 The display luminance shall be adjustable by the flight crew.

BCAR 04 20.4 Provision and updating of data

BCAR 04 20.4.1 The provision and updating of data for use by the display shall be in conformance with the aeronautical data quality system requirements.
(See IEM BCAR 04 20.4.1)

BCAR 04 20.4.2 The display shall be capable of automatically accepting authorized updates to existing data. A means of ensuring that authorized data and all relevant updates to that data have been correctly loaded into the display shall be provided.

BCAR 04 20.4.3 The display shall be capable of accepting updates to authorized data entered manually with simple means for verification prior to final acceptance of the data. Updates entered manually shall be distinguishable on the display from authorized data and its authorized updates and shall not affect display legibility.

BCAR 04 20.4.4 A record shall be kept of all updates, including date and time of application.

BCAR 04 20.4.5 The display shall allow the flight crew to display updates so that the flight crew may review the contents of the updates and determine that they have been included in the system.

BCAR 04 20.5 Performance tests, malfunction alarms and indications

BCAR 04 20.5.1 A means shall be provided for carrying out on-board tests of major functions. In case of a failure, the test shall display information to indicate which part of the system is at fault.

BCAR 04 20.5.2 A suitable alarm or indication of system malfunction shall be provided.

BCAR 04 20.6 Back-up arrangements

To ensure safe navigation in case of a failure of the Electronic Aeronautical Chart Display — ICAO, the provision of adequate back-up arrangements shall include:

a) facilities enabling a safe takeover of display functions in order to ensure that a failure does not result in a critical situation; and

b) a back-up arrangement facilitating the means for safe navigation of the remaining part of the flight.

(See IEM BCAR 04 20.6)

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SUBPART U
ATC SURVEILLANCE MINIMUM ALTITUDE CHART - ICAO

BCAR 04 21.1 Function

BCAR 04 21.1.1 This supplementary chart shall provide information that will enable flight crews to monitor and cross-check altitudes assigned by a controller using an ATS surveillance system.
(See IEM BCAR 04 21.1.1)

BCAR 04 21.1.2 A note indicating that the chart may only be used for cross-checking of altitudes assigned while the aircraft is identified shall be prominently displayed on the face of the chart.

BCAR 04 21.2 Availability

The ATC Surveillance Minimum Altitude Chart – ICAO shall be made available, in the manner prescribed in BCAR 04 1.3.2, where vectoring procedures are established and minimum vectoring altitudes cannot be shown adequately on the Area Chart - ICAO, Standard Departure Chart — Instrument (SID) – ICAO or Standard Arrival Chart — Instrument (STAR) - ICAO.

BCAR 04 21.3 Coverage and scale

BCAR 04 21.3.1 The coverage of the chart shall be sufficient to effectively show the information associated with vectoring procedures.

BCAR 04 21.3.2 The chart shall be drawn to scale.

BCAR 04 21.3.3 The chart shall be drawn to the same scale as the associated Area Chart - ICAO.

BCAR 04 21.4 Projection

BCAR 04 21.4.1 A conformal projection on which a straight line approximates a geodesic line shall be used.

BCAR 04 21.4.2 Graduation marks shall be placed at consistent intervals along the neat lines, as appropriate.

BCAR 04 21.5 Identification

The chart shall be identified by the name of the aerodrome for which the vectoring procedures are established or, when procedures apply to more than one aerodrome, the name associated with the airspace portrayed.
(See IEM BCAR 04 21.5)

BCAR 04 21.6 Culture and topography

BCAR 04 21.6.1 Generalized shorelines of all open water areas, large lakes and rivers shall be shown except where they conflict with data more applicable to the function of the chart.

BCAR 04 21.6.2 Appropriate spot elevations and obstacles shall be shown.
(See IEM BCAR 04 21.6.2)

BCAR 04 21.7 Magnetic variation

The average magnetic variation of the area covered by the chart shall be shown to the nearest degree.

BCAR 04 21.8 Bearings, tracks and radials

BCAR 04 21.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in BCAR 04 21.8.2.

BCAR 04 21.8.2 In areas of high latitude, where it is determined by the Procedures Specialist that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, shall be used.

BCAR 04 21.8.3 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.

BCAR 04 21.9 Aeronautical data

BCAR 04 21.9.1 Aerodromes

BCAR 04 21.9.1.1 All aerodromes that affect the terminal routings shall be shown. Where appropriate, a runway pattern symbol shall be used.

BCAR 04 21.9.1.2 The elevation of the primary aerodrome to the nearest metre or foot shall be shown.

BCAR 04 21.9.2 Prohibited, restricted and danger areas

Prohibited, restricted and danger areas shall be depicted with their identification.

BCAR 04 21.9.3 Air traffic services system

BCAR 04 21.9.3.1 The chart shall show components of the established air traffic services system including:

a) relevant radio navigation aids together with their identifications;

b) lateral limits of relevant designated airspace;

c) relevant significant points associated with standard instrument departure and arrival procedures;
(See IEM BCAR 04 21.9.3.1(c))

d) transition altitude, where established;

e) information associated with vectoring including:

1) minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;

2) lateral limits of minimum vectoring altitude sectors normally defined by bearings and radials to/from radio navigation aids to the nearest degree or, if not practicable, geographical coordinates in degrees, minutes and seconds and shown by heavy lines so as to clearly differentiate between established sectors;
(See IEM BCAR 04 21.9.3.1(e)(2))

3) distance circles at 20-km or 10-NM intervals or, when practicable, 10-km or 5-NM intervals shown as fine dashed lines with the radius indicated on the circumference and centred on the identified aerodrome main VOR radio navigation aid or, if not available, on the aerodrome/heliport reference point;

4) notes concerning correction for low temperature effect, as applicable;

f) communications procedures including call sign(s) and channel(s) of the ATC unit(s) concerned.

BCAR 04 21.9.3.2 A textual description of relevant communication failure procedures shall be provided and shall, whenever feasible, be shown on the chart or on the same page that contains the chart.

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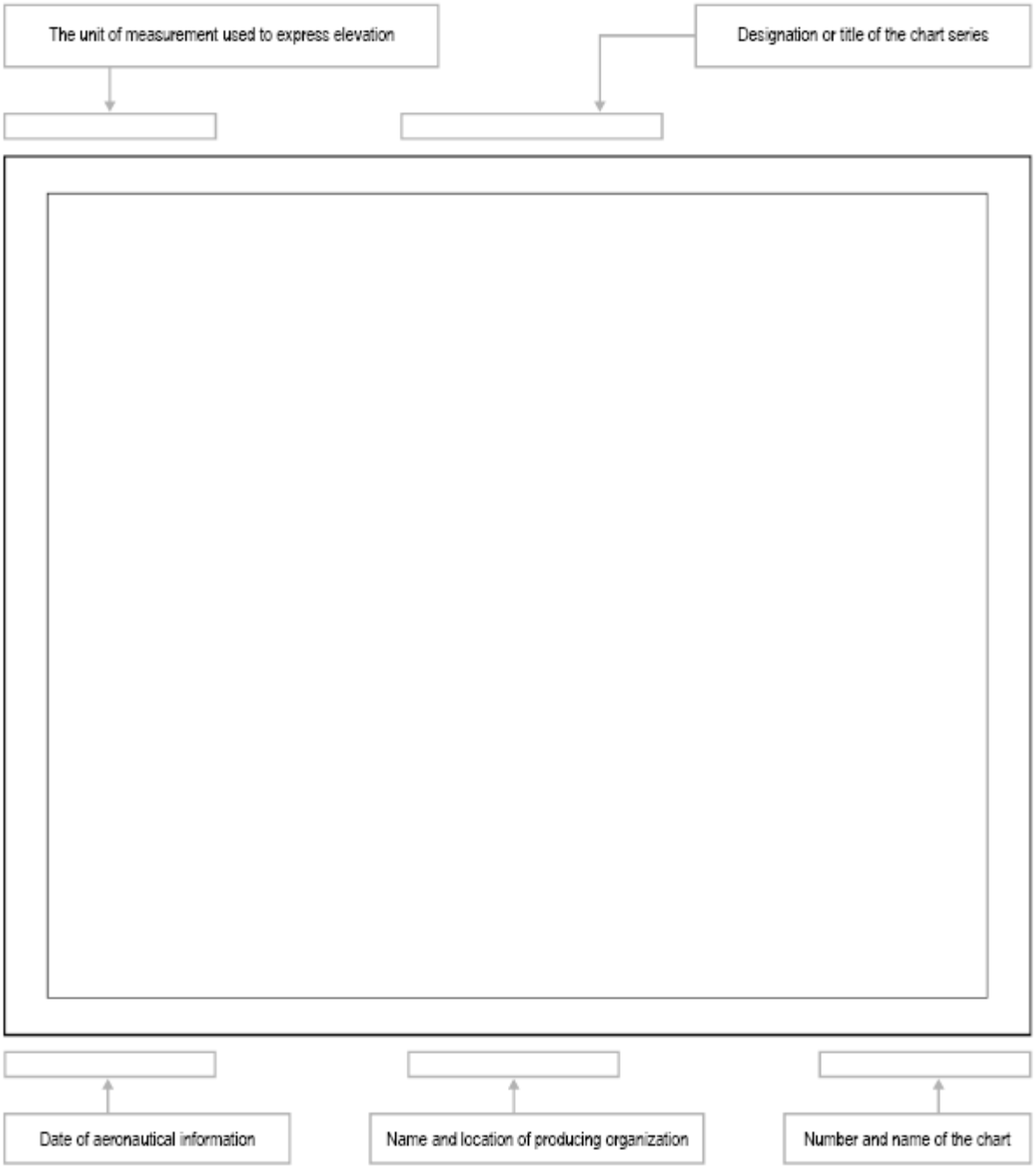
APPENDIX 1 - MARGINAL NOTE LAYOUT



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APPENDIX 2 - CHART SYMBOLS

1. CATEGORY INDEX

	Symbol No.
Shoals	41
Shore line (reliable)	19
Shore line (unreliable)	20
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Built-up Areas (47–50)	
Buildings	50
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Town	48
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Railroads (51–56)	
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Railroad bridge	54
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Highways and Roads (57–62)	
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Primary road	58
Road bridge	61
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Boundaries (international)	63
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Coast guard station	73
Dam	67
Fence	65
Ferry	68
Forest ranger station	76
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Mosque	81
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Outer boundaries	64
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2. ALPHABETICAL INDEX

	Symbol No.
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Wind turbine, unlighted and lighted	140
Wind turbines, minor group and group in major area, lighted	141

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1	Contours	
2	Approximate contours	
3	Relief shown by hachures	
4	Bluff, cliff or escarpment	
5	Lava flow	
6	Sand dunes	
7	Sand area	

8	Gravel		
9	Levee or esker	Alternative	
10	Unusual land features appropriately labelled		Many Small Volcanoes / Rock Outcrop
	Active volcano		
11	Mountain pass		5395

12	Highest elevation on chart	Alternative	17456 / .17456
13	Spot elevation		.6397 .8975
14	Spot elevation (of doubtful accuracy)		.6370±
15	Coniferous trees		
16	Other trees		
17	Palms		

18	Areas not surveyed for contour information or relief data incomplete	Caution

HYDROGRAPHY

19	Shore line (reliable)	
20	Shore line (unreliable)	
21	Tidal flats	
22	Coral reefs and ledges	
23	Large river (perennial)	
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25	Rivers and streams (non-perennial)	Alternative
26	Rivers and streams (unsurveyed)	
27	Rapids	
28	Falls	
29	Canal	

30	Abandoned canal *Note.— Dry canal having landmark value.*		
31	Lakes (perennial)		
32	Lakes (non-perennial)	Alternative	
33	Salt lake		
34	Salt pans (evaporator)		
35	Swamp		
36	Rice field	Alternative	
37	Spring, well or water hole	perennial	●
		intermittent	○

38	Reservoir		Reservoir
39	Dry lake bed	Alternative	
40	Wash	Alternative	
41	Shoals		
42	Glaciers and ice caps		
43	Danger line (2 m or one fathom line)		
44	Charted isolated rock		+
45	Rock awash		
46	Unusual water features appropriately labelled		Covered Reef

CULTURE

BUILT-UP AREAS

47	City or large town	
48	Town	
49	Village	
50	Buildings	

HIGHWAYS AND ROADS

57	Dual highway	
58	Primary road	
59	Secondary road	
60	Trail	
61	Road bridge	
62	Road tunnel	

MISCELLANEOUS (Cont.)

69	Pipeline	Pipeline
70	Oil or gas field	
71	Tank farms	
72	Nuclear power station	
73	Coast guard station	
74	Lookout tower	
75	Mine	
76	Forest ranger station	
77	Race track or stadium	
78	Ruins	
79	Fort	
80	Church	
81	Mosque	
82	Pagoda	
83	Temple	

RAILROADS

51	Railroad (single track)	
52	Railroad (two or more tracks)	
53	Railroad (under construction)	
54	Railroad bridge	
55	Railroad tunnel	
56	Railroad station	

MISCELLANEOUS

63	Boundaries (international)	
64	Outer boundaries	
65	Fence	X—X—X
66	Telegraph or telephone line (when a landmark)	—T—T—
67	Dam	
68	Ferry	

AERODROMES

84	Civil	Land	
85	Civil	Water	
86	Military	Land	
87	Military	Water	

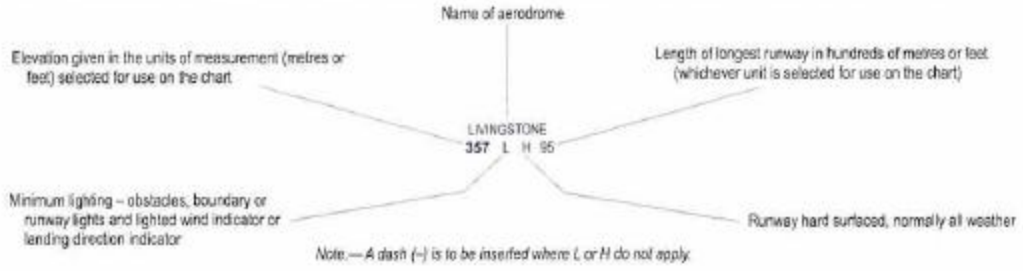
88	Joint civil and military	Land	
89	Joint civil and military	Water	
90	Emergency aerodrome or aerodrome with no facilities		
91	Abandoned or closed aerodrome		

92	Sheltered anchorage	
93	Aerodrome for use on charts on which aerodrome classification is not required e.g. Enroute Charts	
94	Heliport *Note.— Aerodrome for the exclusive use of helicopters*	H

95	*Note.— Where required by the function of the chart, the runway pattern of the aerodrome may be shown in lieu of the aerodrome symbol, for example:*	

AERODROMES (Cont.)
AERODROME DATA IN ABBREVIATED FORM WHICH MAY BE IN ASSOCIATION WITH AERODROME SYMBOLS
(Reference: BCAR 04 16.9.2.2 and BCAR 04 17.9.2.2)

96



AERODROME SYMBOLS FOR APPROACH CHARTS

97	Aerodromes affecting the traffic pattern on the aerodrome on which the procedure is based	
98	The aerodrome on which the procedure is based	

RADIO NAVIGATION AIDS*

99	Basic radio navigation aid symbol Note.— This symbol may be used with or without a box to enclose the data.		
100	Non-directional radio beacon	NDB	
101	VHF omnidirectional radio range	VOR	
102	Distance measuring equipment	DME	
103	Collocated VOR and DME radio navigation aids	VOR/DME	
104	DME distance	Distance in kilometres (nautical miles) to DME → 15 km Identification of radio navigation aid → K A V	
105	VOR radial	Radial bearing from, and identification of, VOR	R 090 K A V
106	UHF tactical air navigation aid	TACAN	

107	Collocated VOR and TACAN radio navigation aids	VORTAC	
108	Instrument landing system	ILS	PLAN VIEW Electronic FRONT COURSE BACK COURSE PROFILE Electronic GLIDE PATH
109	Radio marker beacon	Elliptical Bone Shape	

Note.— Marker beacon may be shown by outline, or stipple, or both.

110 Compass rose
To be orientated on the chart in accordance with the alignment of the station (normally Magnetic North)

Note.— Additional points of compass may be added as required.

Compass rose to be used as appropriate in combination with the following symbols:

VOR	
VOR/DME	
TACAN	
VORTAC	

*Note - Guidance material on the presentation of radio navigation aid data is given in the ICAO Aeronautical Chart Manual (Doc 8697)

AIR TRAFFIC SERVICES

111	Flight information region	FIR	
112	Aerodrome traffic zone	ATZ	
113	Control area Airway Controlled route	CTA AWY	Alternative
114	Uncontrolled route		
115	Advisory airspace	ADA	
116	Control zone	CTR	

117	Air defence identification zone	ADIZ	ADIZ
118	Advisory route	ADR	Alternative
119	Visual flight path	compulsory with radio communication requirement	
		compulsory, without radio communication requirement	
		recommended	
120	Scale-break (on ATS route)		Alternative

			On request fly-by	Compulsory fly-by	On request flyover	Compulsory flyover
121	Reporting and fly-by/flyover functionality	VFR reporting point				
		Intersection	INT			
		VORTAC				
		TACAN				
		VOR				
		VOR/DME				
		NDB				
		Waypoint	WPT			

Note.— See 2.4.4 and 2.4.5.

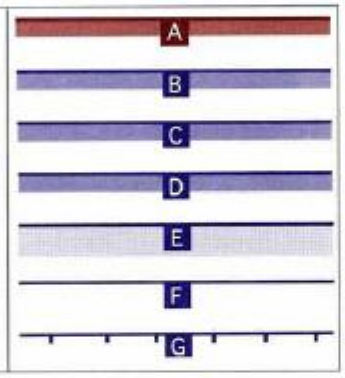
122	Change-over point To be superimposed on the appropriate route symbol at right angles to the route	COP	26 / 36	123	ATS/MET reporting point	MRP	Compulsory On request	124	Final approach fix	FAF	

AIR TRAFFIC SERVICES *(cont.)*

125	Altitudes/flight levels	Altitude/flight level "window"	17 000 10 000	FL 220 10 000
		"At or above" altitude/flight level	7 000	FL 70
		"At or below" altitude/flight level	5 000	FL 50
		"Mandatory" altitude/flight level	3 000	FL 30
		"Recommended" procedure altitude/flight level	5 000	FL 50
		"Expected" altitude	Expect 5 000	Expect FL 50
	Note.— For use only on SID and STAR charts. Not intended for depiction of minimum obstacle clearance altitude.			

AIRSPACE CLASSIFICATIONS

126 Airspace classifications



Aeronautical data in abbreviated form to be used in association with airspace classification symbols:

127 Alternative

TMA DONLON 119.1 C 200m AGL - FL 245

Type — Name or call sign — Radio frequency(ies) — Airspace classification — Vertical limits

AIRSPACE RESTRICTIONS

128	Restricted airspace (prohibited, restricted or danger area)		Common boundary of two areas	
	Note.—The angle and density of rulings may be varied according to scale and the size, shape and orientation of the area.			
129	International boundary closed to passage of aircraft except through air corridor			

OBSTACLES

130	Obstacle		134	Exceptionally high obstacle (optional symbol)	
131	Lighted obstacle		135	Exceptionally high obstacle — lighted (optional symbol) *Note.— For obstacles having a height of the order of 300 m (1 000 ft) above terrain.*	
132	Group obstacles		136	Elevation of top (italics) 52 (15) Height above specified datum (upright type in parentheses)	
133	Lighted group obstacles				

MISCELLANEOUS

137	Prominent transmission line	
138	Isogonic line or isogonal	3° E
139	Ocean station vessel (normal position)	

140	Wind turbine — unlighted and lighted	
141	Wind turbines — minor group and group in major area, lighted	

VISUAL AIDS

142	Marine light *Note 2.– Characteristics are to be indicated as follows:*	F	Alt Alternating B Blue F Fixed	*Note 1.– Marine alternating lights are red and white unless otherwise indicated. Marine lights are white unless colours are stated.*	Fl Flashing G Green Gp Group	Occ Occulting R Red SEC Sector	sec Second (U) Unwatched W White				
143	Aeronautical ground light	☆	Electronic ★	144	Lightship						

SYMBOLS FOR AERODROME/HELIPORT CHARTS

145	Hard surface runway	
146	Pierced steel plank or steel mesh runway	
147	Unpaved runway	
148	Stopway SWY	
149	Taxiways and parking areas	
150	Helicopter alighting area on an aerodrome	Ⓗ
151	Aerodrome reference point ARP	
152	VOR check-point	
153	Runway visual range (RVR) observation site	

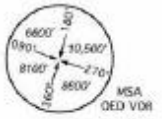
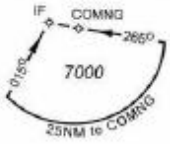
154	Point light	● / O
155	Obstacle light	
156	Landing direction indicator (lighted)	T
157	Landing direction indicator (unlighted)	T
158	Stop bar	•••
159	Runway-holding position — Pattern A / Pattern B *Note.– For application, see Annex 14, Volume I, 5.2.10.*	
160	Intermediate holding position *Note.– For application, see Annex 14, Volume I, 5.2.11.*	
161	Hot spot *Note.– Hot spot location to be circled.*	

SYMBOLS FOR AERODROME OBSTACLE CHARTS - TYPE A, B AND C

		Plan	Profile
162	Tree or shrub		Identification number ①
163	Pole, tower, spire, antenna, etc.		
164	Building or large structure		
165	Railroad		
166	Transmission line or overhead cable		

		Plan	Profile
167	Terrain penetrating obstacle plane		
168	Escarpment		
169	Stopway SWY		
170	Clearway CWY		

ADDITIONAL SYMBOLS FOR USE ON PAPER AND ELECTRONIC CHARTS

	PLAN VIEW	Electronic
171	Minimum sector altitude *Note.— This symbol may be modified to reflect particular sector shapes.* MSA	
172	Terminal arrival altitude *Note.— This symbol may be modified to reflect particular TAA shapes.* TAA	
173	Holding pattern	
174	Missed approach track	

PROFILE

175	Runway	
176	Radio navigation aid (type of aid and its use in the procedure to be annotated on top of the symbol)	
177	Radio marker beacon (type of beacon to be annotated on top of the symbol)	
178	Collocated radio navigation aid and marker beacon (type of aid to be annotated on top of the symbol)	
179	DME fix (distance from DME and the fix use in the procedure to be annotated on top of the symbol)	
180	Collocated DME fix and marker beacon (distance from DME and the type of beacon to be annotated on top of the symbol)	

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APPENDIX 3 - COLOUR GUIDE
(Ref. BCAR 04 2.11.1)

CHART SYMBOLS

Culture, except highways and roads; outlines of large cities, grids and graticules; spot elevations; danger lines and off-shore rocks; names and lettering except for aeronautical and hydrographic features		BLACK	
Built-up areas of cities		BLACK Stipple	
Highways and roads	Optional colours	BLACK Half-tone	
		RED	
Built-up areas for cities (alternative to black stipple)		YELLOW	
Contours and topographic features: Items 1 through 10 of Appendix 2 Hydrographic features: Items 39 through 41 of Appendix 2		BROWN	
Shore lines, drainage, rivers, lakes, bathymetric contours and other hydrographic features including their names or description		BLUE	
Open water areas		BLUE Half-tone	
Salt lakes and salt pans		BLUE Stipple	
Large non-perennial rivers and non-perennial lakes		BLUE Stipple	
Aeronautical data, except for Enroute and Area Charts — ICAO, where different colours may be required. Both contours may be used on the same sheet but, where only one colour is used, dark blue is preferred	Optional colours	MAGENTA	
		DARK BLUE	

CHART SYMBOLS *(Cont.)*

Woods		GREEN	
Areas which have not been surveyed for contour information or relief data are incomplete	Optional colours	GOLDEN BUFF	
		WHITE	

HYPSOMETRIC TINTS

	WHITE	Tint for extreme elevations		SEPIA	
	VIOLET				
	ORANGE or BUFF	Tint for higher range elevations		BROWN	
	YELLOW	Tint for middle range elevations		BUFF	
	GREEN	Tint for lower range elevations	Optional colours	GREEN	
				WHITE	
	BLUE-GREEN	Tint for areas below sea level	Optional colours	BLUE-GREEN	
				LIGHT GREY	

Note.— Basic tints are identical to those specified for the International Map of the World.

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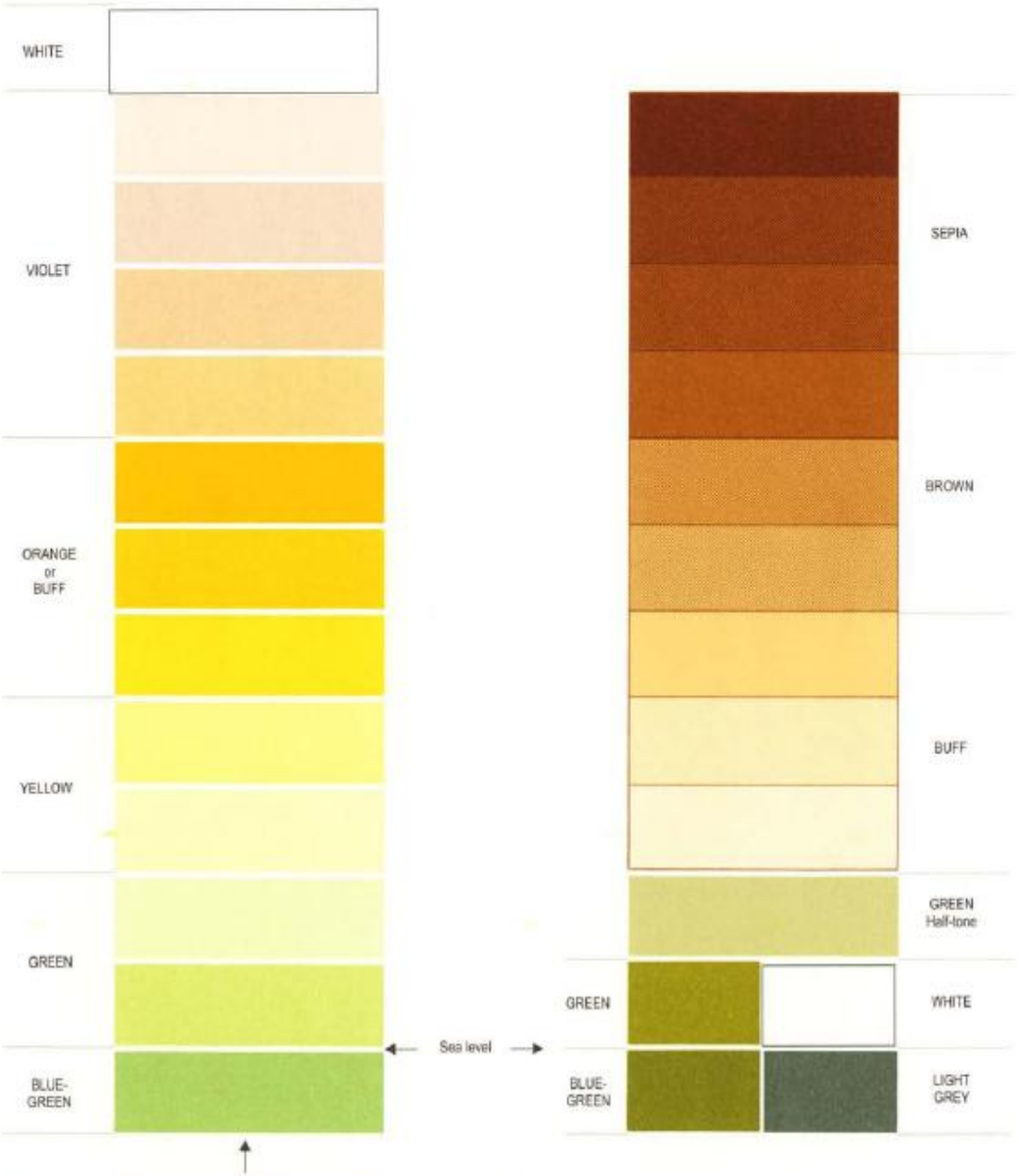
APPENDIX 4 - HYPSOMETRIC TINT GUIDE
(Alternative systems, reference BCAR 04 2.12.2)



Note 1.— These tints are identical to those specified for the International Map of the World.

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

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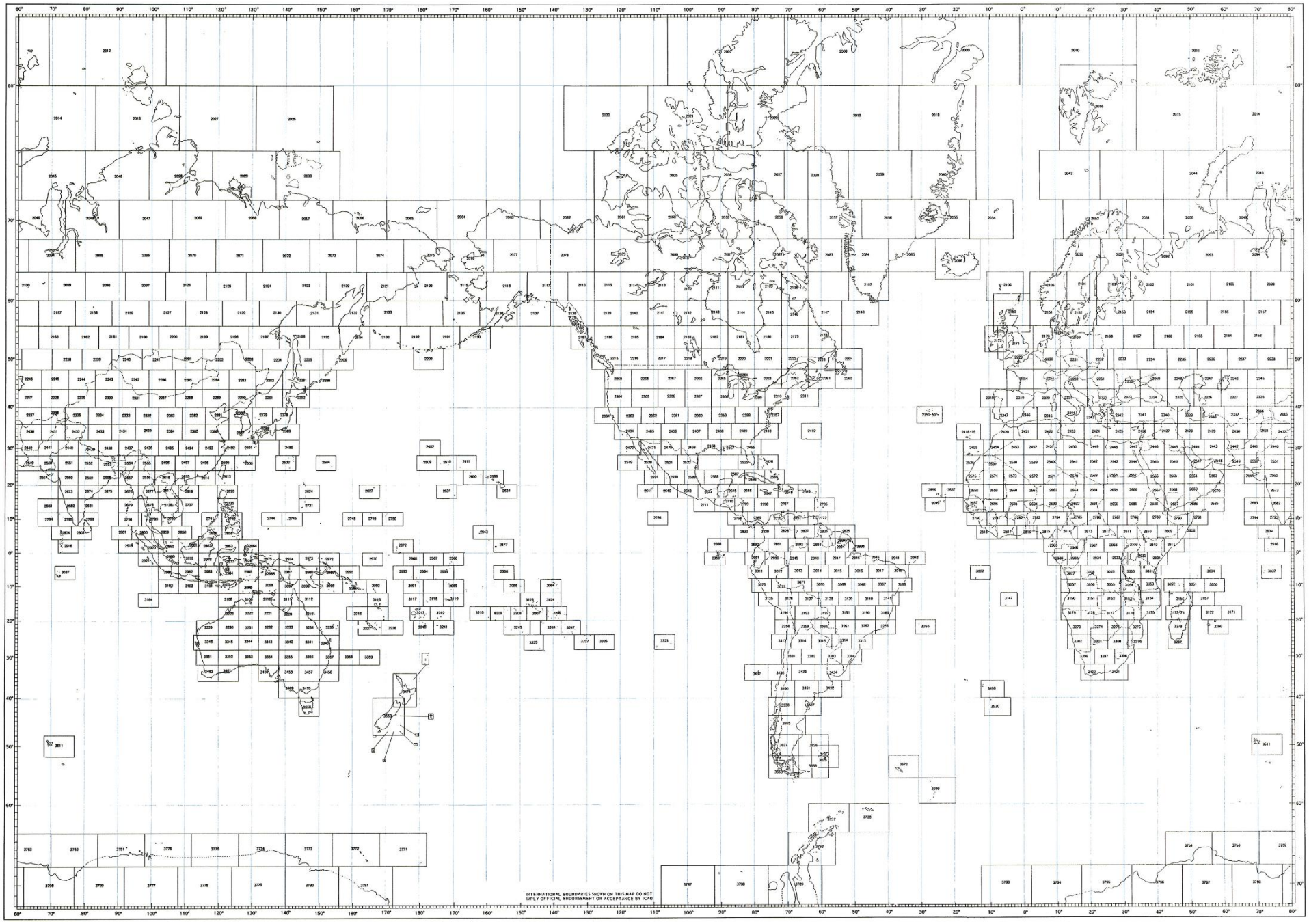
APPENDIX 5 SHEET LAYOUT FOR THE WORLD AERONAUTICAL CHART- ICAO 1:1 000 000



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SECTION 2
IEM

SECTION 2 – INTERPRETATIVE AND EXPLANATORY MATERIAL (IEM) GENERAL & PRESENTATION

1. GENERAL

1.1 If a specific paragraph does not have an IEM, it means that the paragraph does not need one.

2. PRESENTATION

2.1 The sequence after the abbreviation IEM indicates the paragraph number of the referring BCAR 04.

2.2 The abbreviations are defined as follows:

Interpretative and Explanatory Material (IEM) shows the ways or alternatives, but not necessarily the only possible way to comply with a specific paragraph of the BCAR 04.

SUBPART A
APPLICABILITY AND AVAILABILITY

IEM BCAR 04 1.3.2 Charts
(See BCAR 04 1.3.2)

The availability of charts includes specified electronic charts.

IEM BCAR 04 1.3.2.2
(See BCAR 04 1.3.2.2)

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.

IEM BCAR 04 1.3.4
(See BCAR 04 1.3.4)

Guidance material on the preparation of aeronautical charts, including sample formats, is contained in the Aeronautical Chart Manual (Doc 8697).

SUBPART B
GENERAL SPECIFICATIONS

IEM SUBPART B General specification
(See Subpart B)

The Requirements contained in this subpart are applicable to all ICAO aeronautical charts unless otherwise stated in the specifications of the chart concerned.

IEM BCAR 04 2.1.1 Human Factors principles
(See BCAR 04 2.1.1)

Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (Doc 9683).

IEM BCAR 04 2.3.2 The marginal note
(See BCAR 04 2.3.2)
The title may be abbreviated.

IEM BCAR 04 2.4 Symbols
(See BCAR 04 2.4)

The size and prominence of symbols and the thickness and spacing of lines may be varied according to the scale and functions of the chart, with due regard to the importance of the information they convey.

IEM BCAR 04 2.10.2 Political boundaries
(See BCAR 04 2.10.2)

In the case of a dependent territory, the name of the sovereign State may be added in brackets.

IEM BCAR 04 2.12.1 Relief
(See BCAR 04 2.12.1)

Relief is usually portrayed by combinations of contours, hypsometric tints, spot elevations and hill shading, the choice of method being affected by the nature and scale of the chart and its intended use.

IEM BCAR 04 2.13 Prohibited, restricted and danger areas
(See BCAR 04 2.13)

Nationality letters are those contained in Doc 7910 — Location Indicators.

IEM BCAR 04 2.15.2 Magnetic variation
(See BCAR 04 2.15.2)

The date and the annual change may be shown.

IEM BCAR 04 2.17.1 Magnetic variation
(See BCAR 04 2.17.1)

Specifications governing the quality system are given in BCAR 15, Subpart C.

IEM BCAR 04 2.17.2 Aeronautical data
(See BCAR 04 2.17.2)

Specifications concerning the chart resolution for aeronautical data are contained in PANS-AIM (Doc 10066), Appendix 1.

IEM BCAR 04 2.17.3 Data Integrity
(See BCAR 04 2.17.3)

Specifications concerning the integrity classification related to aeronautical data are provided in PANS-AIM (Doc 10066), Appendix 1.

IEM BCAR 04 2.17.4 Digital data error detection techniques
(See BCAR 04 2.17.4)

Detailed specifications concerning digital data error detection techniques are contained in PANS-AIM (Doc 10066).

IEM BCAR 04 2.18.1.1 Horizontal reference system
(See BCAR 04 2.18.1.1)

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

BCAR 04 2.18.1.3 Resolution of geographical coordinates
(See BCAR 04 2.18.1.3)

Specifications concerning the determination and reporting (accuracy of field work and data integrity) of WGS-84-related aeronautical coordinates for geographical positions established by air traffic services are given in BCAR ATS, Subpart B; and for aerodrome/heliport-related positions, in BCAR, Subpart B.

Specifications concerning the accuracy and integrity classification of WGS-84-related aeronautical data are contained in PANS-AIM (Doc 10066), Appendix 1.

IEM BCAR 04 2.18.2.1 Vertical reference system
(See BCAR 04 2.18.2.1)

The geoid globally most closely approximates MSL. It is defined as the equipotential surface in the gravity field of the Earth that coincides with the undisturbed MSL extended continuously through the continents.

Gravity-related heights (elevations) are also referred to as orthometric heights while distances of points above the ellipsoid are referred to as ellipsoidal heights.

IEM BCAR 04 2.18.2.2 Geoid undulation
(See BCAR 04 2.18.2.2)

Specifications concerning the determination and reporting (accuracy of field work and data integrity) of elevation and geoid undulation at specific positions at aerodromes/heliports are given in BCAR 14, Subpart B.

Specifications concerning the accuracy and integrity classification of elevation and geoid undulation at specific positions at aerodromes/heliports are contained in PANS-AIM (Doc 10066), Appendix 1.

IEM BCAR 04 2.18.2.3 Resolution of elevation and geoid undulation
(See BCAR 04 2.18.2.3)

Specifications concerning the chart resolution of elevation and geoid undulation are contained in PANS-AIM (Doc 10066), Appendix 1.

SUBPART C
AERODROME OBSTACLE CHART – ICAO TYPE A (OPERATING LIMITATIONS)

IEM BCAR 04 3.4.1 Coverage and scale
(See BCAR 04 3.4.1)

Isolated distant obstacles that would unnecessarily increase the sheet size may be indicated by the appropriate symbol and an arrow, provided that the distance and bearing from the end of the runway farthest removed and the elevation are given.

IEM BCAR 04 3.4.3 Coverage and scale
(See BCAR 04 3.4.3)

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

IEM BCAR 04 3.8.2.2 Take-off flight path area
(See BCAR 04 3.8.2.2)

When a 1.0 % survey plane touches no obstacles, this plane may be lowered until it touches the first obstacle.

IEM BCAR 04 3.8.3.1 Take-off flight path area
(See BCAR 04 3.8.3.1)

In BCAR 14, Annex A, Section 3, guidance is given on declared distances.

IEM BCAR 04 3.8.4.1 The plan view shall show
(See BCAR 04 3.8.4.1)

This does not exclude the necessity for indicating critical spot elevations within the take-off flight path flight area.

IEM BCAR 04 3.8.4.2 The profile view
(See BCAR 04 3.8.4.2)

An obstacle profile consisting of a line joining the tops of each obstacle and representing the shadow created by successive obstacles may be shown.

SUBPART D
AERODROME OBSTACLE CHART — TYPE B

IEM BCAR 04 4.4.1 Coverage and scale
(See BCAR 04 4.4.4.1)

Isolated distant obstacles that would unnecessarily increase the sheet size may be indicated by the appropriate symbol and an arrow, provided that the distance and bearing from the aerodrome reference point and elevation are given.

IEM BCAR 04 4.5 Coverage and scale
(See BCAR 04 4.5)

Lines of latitude and longitude may be shown across the face of the chart.

IEM BCAR 04 4.7.4 Culture and topography
(See BCAR 04 4.7.4)

Geographical names of features may be shown if of significance.

IEM BCAR 04 4.9.1 (l) Aeronautical data
(See BCAR 04 4.4.9.1 (l))

The take-off area is described in BCAR 04 3.8.2.1. The approach area consists of an area on the surface of the earth lying directly below the approach surface as specified in BCAR 14, Subpart D.

IEM BCAR 04 4.9.1 (m) (4) Aeronautical data
(See BCAR 04 4.9.1 (m) (4))

This does not exclude the necessity for indicating critical spot elevations within the take-off and approach areas.

IEM BCAR 04 4.9.1 (n) Aeronautical data
(See BCAR 04 4.9.1 (n))

The specifications in BCAR 14, Subpart D, are minimum requirements. Where the competent authority has established lower surfaces, they may be used in the determination of obstacles.

SUBPART E
AERODROME TERRAIN AND OBSTACLE CHART — (ELECTRONIC)

IEM BCAR 04 5 5.1 Availability
(See BCAR 04 5.2.1)

Where the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) is made available, the Aerodrome Obstacle Chart — ICAO Type A (Operating Limitations) and the Aerodrome Obstacle Chart — ICAO Type B are not required
(see BCAR 04 3.2.1 and BCAR 04 4.2.1).

The information required by the Precision Approach Terrain Chart — ICAO may be provided in the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic). Where this occurs, the Precision Approach Terrain Chart — ICAO is not required (see BCAR 04 6.2.1).

IEM BCAR 04 5.2.3
(See BCAR 04 5.2.3)

For specifications regarding hard copy printed output, see BCAR 04 5.7.7.

IEM BCAR 04 5.2.4
(See BCAR 04 5.2.4)

The use of the ISO 19100 series of standards for geographic information supports the interchange and use of the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) among different users.

IEM BCAR 04 5.5.1.1 Chart content
(See BCAR 04 5.5.1.1)

ISO Standard 19117 contains a definition of the schema describing the portrayal mechanism of feature-based geographic information, while ISO Standard 19109 contains rules for application schema. Spatial geometry and associated topological relationships are defined in ISO Standard 19107.

IEM BCAR 04 5.5.2.1 Terrain feature
(See BCAR 04 5.5.2.1)

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

IEM BCAR 04 5.5.2.2
(See BCAR 04 5.5.2.2)

In accordance with BCAR 15, Subpart E and PANS-AIM (Doc 10066), Chapter 5 and Appendices 1 and 8, the DEM for Area 2 post spacing (grid) is specified at 1 arc second (approximately 30 m).

IEM BCAR 04 5.5.2.6
(See BCAR 04 5.5.2.6)

Specifications concerning terrain attributes are contained in PANS-AIM (Doc 10066), Appendix 6, Table A6-1.

IEM BCAR 04 5.5.3.1 Obstacle features
(See BCAR 04 5.5.3.1)

Specifications concerning obstacle data sets are contained in PANS-AIM (Doc 10066), Chapter 5 and Appendices 1, 6 and 8.

IEM BCAR 04 5.5.3.4
(See BCAR 04 5.5.3.4)

Specifications concerning obstacle attributes are contained in PANS-AIM (Doc 10066), Appendix 6, Table A6-2

IEM BCAR 04 5.5.4.1 Aerodrome features
(See BCAR 04 5.5.4.1)

Specifications concerning aerodrome features and associated attributes are contained in PANS-AIM (Doc 10066), Chapter 5 and Appendix 1.

IEM BCAR 4 5.5.4.3
(See BCAR 04 5.5.4.3 (b))

Magnetic variation may be database-linked to the aerodrome reference point.

(See BCAR 04 5.5.4.3)

BCAR 14, Annex A, provides guidance on declared distances.

IEM BCAR 04 5.5.5 Radio navigation aid features
(See BCAR 04 5.5.5)

Navigation aid feature attributes may be linked to the portrayed navigation aid features in the database(s).

IEM BCAR 04 5.6.1 Accuracy and resolution
(See BCAR 04 5.6.1)

Specifications concerning the accuracy of aeronautical, terrain and obstacle data are contained in the PANS-AIM (Doc 10066), Appendix 1.

IEM BCAR 04 5.6.2
(See BCAR 04 5.6.2)

Specifications concerning the order of resolution for aeronautical, terrain and obstacle data are provided in the PANS-AIM (Doc 10066), Appendix 1.

IEM BCAR 04 5.7.6 Electronic functionality
(See BCAR 04 5.7.6)

An electronic chart format with user-selectable information layers is the preferred method of presentation for most aerodrome features.

IEM BCAR 04 5.7.7
(See BCAR 04 5.7.7)

Printed output may consist of “tiled” sheets or specific selected areas according to user requirements.

Feature attribute information available through database link may be supplied separately on appropriately referenced sheets.

IEM BCAR 04 5.8.2 Chart data product specifications
(See BCAR 04 5.8.2)

ISO Standard 19131 specifies the requirements and outline of data product specifications for geographic information.

IEM BCAR 04 5.8.4
(See BCAR 04 5.8.4)

ISO Standard 19123 contains schema for coverage geometry and functions.

IEM BCAR 04 5.8.5
(See BCAR 04 5.8.5)

ISO Standard 19113 contains quality principles for geographic information while ISO Standard 19114 covers quality evaluation procedures.

IEM BCAR 04 5.8.8
(See BCAR 04 5.8.8)

ISO Standard 19115 specifies requirements for geographic information metadata.

The chart data product specifications document the chart data product which is implemented as data set. Those data sets are described by metadata.

SUBPART G
ENROUTE CHART

IEM BCAR 04 7.1 Function
(See BCAR 04 7.1)

Simplified versions of these charts are appropriate for inclusion in the Belize Aeronautical Information Publication to complement the tabulation of communication and navigation facilities.

IEM BCAR 04 7.2.1 Availability
(See BCAR 04 7.2.1)

Under certain conditions, an Area Chart may have to be provided. (See BCAR 04, Subpart H.)

IEM BCAR 04 7.3 Coverage and scale
(See BCAR 04 7.3)

A uniform scale for charts of this type cannot be specified due to the varying degree of congestion of information in certain areas.

A linear scale based on the mean scale of the chart may be shown.

IEM BCAR 04 7.6.2 Culture and topography
(See BCAR 04 7.6.2)

Quadrilaterals formed by the parallels and meridians normally correspond to the whole degree of latitude and longitude. Regardless of the chart scale being used, the area minimum altitude relates to the consequent quadrilateral.

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

IEM BCAR 04 7.9.1 Aerodromes
(See BCAR 04 7.9.1)

Other aerodromes may be shown.

IEM BCAR 04 7.9.3.1.1(d) Air traffic services system
(See IEM BCAR 04 7.9.3.1.1(d))

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 (Doc 8126).

IEM BCAR 04 7.9.3.1.1(h) Air traffic services system
(See BCAR 04 7.9.3.1.1(h))

Overall distances between radio navigation aids may also be shown.

IEM BCAR 04 7.9.3.1.1(i) Air traffic services system
(See BCAR 04 7.9.3.1.1(i))

Change-over points established at the mid-point between two aids, or at the intersection of two radials

in the case of a route which changes direction between the aids, need not be shown for each route segment if a general statement regarding their existence is made.

IEM BCAR 04 7.9.3.1.1(l) Air traffic services system
(See BCAR 04 7.9.3.1.1(l))

ADIZ procedures may be described in the chart legend.

IEM BCAR 04 7.9.4.1 Supplementary information
(See BCAR 04 7.9.4.1)

For specifications of these charts, see Subpart H, I and J.

Departure routes normally originate at the end of a runway; arrival routes normally terminate at the point where an instrument approach is initiated.

SUBPART H
AREA CHART — ICAO

IEM BCAR 04 8.1(c) Function
(See BCAR 04 8.1(c))

The function described in BCAR 04 8.1 c) may be satisfied by a separate chart or an inset on an Enroute Chart — ICAO.

IEM BCAR 04 8.2.2 Availability
(See BCAR 04 8.2.2)

Under certain conditions, a Standard Departure Chart — Instrument (SID) — ICAO and a Standard Arrival Chart — Instrument (STAR) — ICAO may have to be provided (see Subparts I and J).

IEM BCAR 04 8.5 Identification
(See BCAR 04 8.5)

The name may be that of the air traffic services centre, the name of the largest city or town situated in the area covered by the chart or the name of the city that the aerodrome serves. Where more than one aerodrome serves the city or town, the name of the aerodrome on which the procedures are based shall be added.

IEM BCAR 04 8.6.2 Culture and topography
(See BCAR 04 8.6.2)

The next higher suitable contour line appearing on base topographic maps exceeding 300 m (1 000 ft) above the elevation of the primary aerodrome may be selected to start layer tinting.

An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in BCAR 04 Appendix 3 — Colour Guide for contours and topographic features.

Appropriate spot elevations and obstacles are those provided by the procedures specialist.

IEM BCAR 04 8.9.3 Area minimum altitudes
(See BCAR 04 8.9.3)

Quadrilaterals formed by the parallels and meridians normally correspond to the whole degree of latitude and longitude. Regardless of the chart scale being used, the area minimum altitude relates to the consequent quadrilateral.

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

IEM BCAR 04 8.9.4.1.1 (j) Air traffic services system
(See BCAR 04 8.9.4.1.1(j))

Overall distances between radio navigation aids may also be shown.

IEM BCAR 04 8.9.4.1.1 (k) Air traffic services system
(See BCAR 04 8.9.4.1.1(k))

Change-over points established at midpoint between two aids, or at the intersection of two radials in the case of a route which changes direction between the aids, need not be shown for each route segment if a general statement regarding their existence is made.

IEM BCAR 04 8.9.4.1.1 (m) Air traffic services system
(See BCAR 04 8.9.4.1.1(m))

Where ATS surveillance systems are used to vector aircraft to or from significant points on a published standard departure or arrival route or to issue clearance for descent below the minimum sector altitude during arrival, the relevant procedures may be shown on the Area Chart – ICAO unless excessive chart clutter will result.

Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart – ICAO may be provided (see Subpart U), in which case the elements indicated by BCAR 04 8.9.4.1.1, l), need not be duplicated on the Area Chart.

SUBPART I
STANDARD DEPARTURE CHART - INSTRUMENT (SID)

IEM BCAR 04 9.1 Function
(See BCAR 04 9.1)

Provisions governing the identification of standard departure routes are in BCAR ATS, Appendix 3; guidance material relating to the establishment of such routes is contained in the ICAO Air Traffic Services Planning Manual (Doc 9426).

Provisions governing obstacle clearance criteria and details of the minimum information to be published are contained in the ICAO Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part II.

IEM BCAR 04 9.3.1 Coverage and scale
(See BCAR 04 9.3.1)

The departure route normally originates at the end of a runway.

IEM BCAR 04 9.5 Identification
(See BCAR 04 9.5)

The identification of the standard departure route(s) — instrument is provided by the Procedures Specialist.

IEM BCAR 04 9.6.2 Culture and topography
(See BCAR 04 9.6.2)

The next higher suitable contour line appearing on base topographic maps exceeding 300 m (1 000 ft) above the aerodrome elevation may be selected to start layer tinting.

An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in BCAR 04 Appendix 3 — Colour Guide for contours and topographic features.

Appropriate spot elevations and obstacles are those provided by the Procedures Specialist.

IEM BCAR 04 9.8.1 Bearings, tracks and radials
(See BCAR 04 9.8.1)

A note to this effect may be included on the chart.

IEM BCAR 04 9.9.3.2 Minimum sector altitude
(See BCAR 04 9.9.3.2)

Quadrilaterals formed by the parallels and meridians normally correspond to the half degree of latitude and longitude. Regardless of the chart scale being used, the area minimum altitude relates to the consequent quadrilateral.

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

IEM BCAR 04 9.9.4.1.1 (a) (7) Air traffic services system
(See BCAR 04 9.9.4.1.1(a)(7))

Where ATS surveillance systems are used to vector aircraft to or from significant points on a published standard departure route, the relevant procedures may be shown on the Standard Departure Chart — Instrument (SID) — ICAO unless excessive chart clutter will result.

Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — ICAO may be provided (see Subpart U), in which case the elements indicated by BCAR 04 9.9.4.1.1, a) 6), need not be duplicated on the Standard Departure Chart — Instrument (SID) — ICAO.

IEM BCAR 04 9.9.4.1.1 (f) Air traffic services system
(See BCAR 04 9.9.4.1.1(f))

In accordance with PANS-OPS, Volume II, information on close-in obstacles is provided by the Procedures Specialist.

IEM BCAR 04 9.9.4.1.1 (h) Air traffic services system
(See BCAR 04 9.9.4.1.1(h))

Refer to the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part III, Section 5 for information on a PBN requirements box.

IEM BCAR 04 9.9.4.3 Aeronautical database requirements
(See BCAR 04 9.9.4.3)

Appropriate data are those provided by the Procedures Specialist.

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SUBPART J
STANDARD ARRIVAL CHART—INSTRUMENT (STAR) — ICAO

IEM BCAR 04 10.1 Function
(See BCAR 04 10.1)

Standard arrival routes — instruments are to be interpreted as including “standard descent profiles”, “continuous descent approach”, and other non-standard descriptions. In the case of a standard descent profile, the depiction of a cross-section is not required.

Provisions governing the identification of standard arrival routes are in BCAR ATS, Appendix 3; guidance material relating to the establishment of such routes is contained in the ICAO Air Traffic Services Planning Manual (Doc 9426).

IEM BCAR 04 10.5 Identification
(See BCAR 04 10.5)

The identification of the standard arrival route(s) — instrument is provided by the Procedures Specialist.

IEM BCAR 04 10.6.2 Culture and topography
(See BCAR 04 10.6.2)

The next higher suitable contour line appearing on base topographic maps exceeding 300 m (1 000 ft) above the aerodrome elevation may be selected to start layer tinting.

An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in BCAR 04 Appendix 3 — Colour Guide for contours and topographic features.

Appropriate spot elevations and obstacles are those provided by the Procedures Specialist.

IEM BCAR 04 10.8.1 Bearings, tracks and radials
(See BCAR 04 10.8.1)

A note to this effect may be included on the chart.

IEM BCAR 04 10.9.3.2 Minimum sector altitude
(See BCAR 04 10.9.3.2)

Quadrilaterals formed by the parallels and meridians normally correspond to the half degree of latitude and longitude. Regardless of the chart scale being used, the area minimum altitude relates to the consequent quadrilateral.

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

IEM BCAR 04 10.9.4.1.1 Air traffic services system
(See BCAR 04 10.9.4.1.1)

Where ATS surveillance systems are used to vector aircraft to or from significant points on a published standard arrival route or to issue clearance for descent below the minimum sector altitude during

arrival, the relevant procedures may be shown on the Standard Arrival Chart — Instrument (STAR) — ICAO unless excessive chart clutter will result.

Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — ICAO may be provided (see Subpart U), in which case the elements indicated by BCAR 04 10.9.4.1.1, a) 6), need not be duplicated on the Standard Arrival Chart — Instrument (STAR) — ICAO.

IEM BCAR 04 10.9.4.1.1 (g) Air traffic services system
(See BCAR 04 10.9.4.1.1(g))

Refer to the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part III, Section 5 for information on a PBN requirements box.

IEM BCAR 04 10.9.4.3 Aeronautical database requirements
(See BCAR 04 10.9.4.3)

Appropriate data are those provided by the Procedures Specialist.

SUBPART K
INSTRUCTION APPROACH CHART

IEM BCAR 04 11.1 Function
(See BCAR 04 11.1)

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

IEM BCAR 04 11.2.3 Availability
(See BCAR 04 11.2.3)

A single precision or non-precision approach procedure chart may be provided to portray more than one approach procedure when the procedures for the intermediate approach, final approach and missed approach segments are identical.

IEM BCAR 04 11.2.4
(See BCAR 04 11.2.4)

For categories of aircraft, see ICAO Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part I, Section 4, Chapter 9.

IEM BCAR 04 11.6 Identification
(See BCAR 04 11.6)

The identification of the instrument approach procedure is provided by the Procedures Specialist.

IEM BCAR 04 11.7.2 Culture and topography
(See BCAR 04 11.7.2)

The next higher suitable contour line appearing on base topographic maps exceeding 150 m (500 ft) above the aerodrome elevation may be selected to start layer tinting.

An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in BCAR 04 Appendix 3 — Colour Guide for contours and topographic features.

Appropriate spot elevations are those provided by the Procedures Specialist.

IEM BCAR 4 11.7.3
(See BCAR 4 11.7.3)

The next higher suitable contour line appearing on base topographic maps exceeding 150 m (500 ft) above the aerodrome elevation may be selected to start layer tinting.

An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in Appendix 3 —Colour Guide for contours and topographic features.

Appropriate spot elevations are those provided by the Procedures Specialist.

IEM BCAR 04 11.9.1 Bearings, tracks and radials
(See BCAR 04 11.9.1)

A note to this effect may be included on the chart.

IEM BCAR 04 11.10.2.1 Obstacles
(See BCAR 04 11.10.2.1)

Appropriate obstacles are those provided by the Procedures Specialist.

IEM BCAR 04 11.10.6.5 Portrayal of procedure tracks
(See BCAR 04 11.10.6.5)

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.

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

IEM BCAR 04 11.10.8.10 Supplementary information
(See BCAR 04 11.10.8.10)

Refer to the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part III, Section 5 for information on a PBN requirements box.

IEM BCAR 04 11.10.9 Aeronautical database requirements
(See BCAR 04 11.10.9)

Appropriate data are those provided by the Procedures Specialist.

SUBPART L
VISUAL APPROACH CHART

IEM BCAR 04 12.3.2 Scale
(See BCAR 04 12.3.2)

A scale of 1:250 000 or 1:200 000 is preferred.

IEM BCAR 04 12.4 Format
(See BCAR 04 12.4)

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

IEM BCAR 04 12.7.4 Culture and topography
(See BCAR 04 12.7.4)

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

SUBPART M
AERODROME/HELIPORT CHART

IEM BCAR 04 13.2.2 Availability
(See BCAR 04 13.2.2)

Under certain conditions, an Aerodrome Ground Movement Chart — ICAO and an Aircraft Parking/Docking Chart — ICAO may have to be provided (see Subparts N and O); in which case, the elements portrayed on these supplementary charts need not be duplicated on the Aerodrome/Heliport Chart — ICAO.

IEM BCAR 04 13.6.1(d) Aerodrome/heliport data
(See BCAR 04 13.6.1(d))

Bearing strengths may be shown in tabular form on the face or verso of the chart.

IEM BCAR 04 13.6.1(e)
(See BCAR 04 13.6.1(e))

Bearing strengths or aircraft type restrictions may be shown in tabular form on the face or verso of the chart.

IEM BCAR 04 13.6.1(g)
(See BCAR 04 13.6.1(g))

Bearing strengths or aircraft type restrictions may be shown in tabular form on the face or verso of the chart.

IEM BCAR 04 13.6.1(h)
(See BCAR 04 13.6.1(h))

Additional information regarding hot spots may be shown in tabular form on the face or verso of the chart.

IEM BCAR 04 13.6.3(a)
(See BCAR 04 13.6.3(a))

Heliport types are identified in Annex 14, Volume II, as surface-level, elevated or helideck.

SUBPART N
AERODROME GROUND MOVEMENT CHART

IEM BCAR 04 14.5.2 Magnetic variation
(See BCAR 04 14.5.2)

This chart need not be True North orientated.

IEM BCAR 04 14.6.(e) Aerodrome data
(See BCAR 04 14.6(e))

Additional information regarding hot spots may be shown in tabular form on the face or verso of the chart.

SUBPART O
AIRCRAFT PARKING/DOCKING CHART

IEM BCAR 04 15.5.2 Magnetic variation
(See BCAR 04 15.5.2)

This chart need not be True North orientated.

IEM BCAR 04 15.6 (e) Aerodrome data
(See BCAR 04 15.6(e))

Additional information regarding hot spots may be shown in tabular form on the face or verso of the chart.

SUBPART P
WORLD AERONAUTICAL CHART 1:1 000 000

IEM BCAR 04 16.1 Function
(See BCAR 04 16.1)

This chart may also serve:

d) as a basic aeronautical chart:

1) when highly specialized charts lacking visual information do not provide essential data;

2) to provide complete world coverage at a constant scale with a uniform presentation of planimetric data;

3) in the production of other charts required by international civil aviation;

e) as a pre-flight planning chart.

IEM BCAR 04 16.2 Availability
(See BCAR 04 16.2.1)

When operational or chart production considerations indicate that operational requirements can be effectively satisfied by Aeronautical Charts — ICAO 1:500 000 or Aeronautical Navigation Charts — ICAO Small Scale, either of these charts may be made available instead of the basic 1:1 000 000 chart.

IEM BCAR 04 16.4.1 Format
(See BCAR 04 16.4.1)

The language of the publishing country may be used in addition to the ICAO working language.

IEM BCAR 04 16.4.4
(See BCAR 04 16.4.4)

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

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.

IEM BCAR 04 16.5.4 Projection
(See BCAR 04 16.5.4)

Meridians may be numbered within the body of the chart.

IEM BCAR 04 16.6 Identification
(See BCAR 04 16.6)

The corresponding International Map of the World (IMW) sheet number may also be shown.

IEM BCAR 04 16.7.2.1 Railroads
(See BCAR 04 16.7.2.1)

In congested areas, some railroads may be omitted in the interest of legibility.

Railroads may be named where space permits.

IEM BCAR 04 16.7.2.2
(See BCAR 04 16.7.2.2)

A descriptive note may be added.

IEM BCAR 04 16.7.3.2 Highways and roads
(See BCAR 04 16.7.3.2)

The numbers or names of important highways may be shown.

IEM BCAR 04 16.7.4 Landmarks
(See BCAR 04 16.7.4)

Descriptive notes may be added.

IEM BCAR 04 16.7.6.2 Hydrography
(See BCAR 04 16.7.6.2)

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

IEM BCAR 04 16.7.6.3
(See BCAR 04 16.7.6.3)

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

IEM BCAR 04 16.7.12.1 Wooded areas
(See BCAR 04 16.7.12.1)

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

IEM BCAR 04 16.9.3.1 Obstacles
(See IEM BCAR 04 16.9.3.1)

Objects of a height of 100 m (300 ft) or more above ground are normally regarded as obstacles.

IEM BCAR 04 16.9.5.2 Air traffic services system
(See IEM BCAR 04 16.9.5.2)

ADIZ procedures may be described in the chart legend.

SUBPART Q

AERONAUTICAL CHART — 1:500 000

IEM BCAR 04 17.1 Function

(See BCAR 04 17.1)

This chart may be used:

a) to serve as a basic aeronautical chart;

b) to provide a suitable medium for basic pilot and navigation training;

c) to supplement highly specialized charts which do not provide essential visual information;

d) in pre-flight planning.

It is intended that these charts be provided for land areas where charts of this scale are required for civil air operations employing visual air navigation independently or in support of other forms of air navigation.

Where States produce charts of this series covering their national territories, the entire area being portrayed is usually treated on a regional basis.

IEM BCAR 04 17.2 Availability

(See BCAR 04 17.2)

The selection of this scale as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000 is covered by Subpart P of BCAR 04 in 16.2.1 and 16.2.2.

IEM BCAR 04 17.4.1 Format

(See BCAR 04 17.4.1)

The language of the publishing country or any other language may be used in addition to the ICAO working language.

IEM BCAR 04 17.4.4 Format

(See BCAR 04 17.4.4)

Sheet lines may be varied to satisfy particular requirements.

IEM BCAR 04 17.5.3.1 Projection

(See BCAR 04 17.5.3.1)

At high latitudes, this interval may be increased.

IEM BCAR 04 17.7.2.1 Railroads

(See BCAR 04 17.7.2.1)

In congested areas, some railroads may be omitted in the interest of legibility.

Railroads may be named.

Rail stations may be shown.

IEM BCAR 04 17.7.2.2 Tunnels
(See BCAR 04 17.7.2.2)

A descriptive note may be added, if necessary, to accentuate this feature.

IEM BCAR 04 17.7.3.1 Highways and roads
(See BCAR 04 17.7.3.1)

Roads under construction may be show

IEM BCAR 04 17.7.3.2
(See BCAR 04 17.7.3.2)

The numbers or names of important highways may be shown.

IEM BCAR 04 17.7.4 Landmarks
(See BCAR 04 17.7.4)

Descriptive notes may be added.

IEM BCAR 04 17.7.5 Political boundaries
(See BCAR 04 17.7.5)

Other boundaries may be shown.

IEM BCAR 04 17.7.6.2 Hydrography
(See BCAR 04 17.7.6.2)

A narrow band of darker tone may be used along the shore line to emphasize this featu*re.*

IEM BCAR 04 17.7.6.3 Reefs
(See BCAR 04 17.7.6.3)

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

IEM BCAR 04 17.7.12.1 Wooded areas
(See BCAR 04 17.7.12.1)

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

IEM BCAR 04 17.9.3.1 Obstacles
(See BCAR 04 17.9.3.1)

Objects of a height of 100 m (300 ft) or more above ground are normally regarded as obstacles.

IEM BCAR 04 17.9.5.2 Air traffic services system
(See BCAR 04 17.9.5.2)

ADIZ procedures may be described in the chart legend.

SUBPART R
AERONAUTICAL NAVIGATION CHART - SMALL SCALE

IEM BCAR 04 18.2 Availability
(See BCAR 04 18.2)

The selection of this scale as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000 is covered by BCAR 04 16.2.1 and BCAR 04 16.2.2

IEM BCAR 04 18.3.1 Coverage and scale
(See BCAR 04 18.3.1)

A sheet layout for this series is contained in the Aeronautical Chart Manual (Doc 8697).

The sheet size may represent the maximum press size available to the producing agency.

IEM BCAR 04 18.4.1 Format
(See BCAR 04 18.4.1)

The language of the publishing country or any other language may be used in addition to the ICAO working language.

IEM BCAR 04 18.4.2
(See BCAR 04 18.4.2)

There is no internationally agreed sheet numbering.

IEM BCAR 04 18.6.2.1 Railroads
(See BCAR 04 18.6.2.1)

In congested areas, some railroads may be omitted in the interest of legibility.

IEM BCAR 04 18.6.2.2
(See BCAR 04 18.6.2.2)

A descriptive note may be added.

IEM BCAR 04 18.6.4 Landmarks
(See BCAR 04 18.6.4)

Descriptive notes may be added.

IEM BCAR 4 18.6.6 Hydrography
(See BCAR 4 18.6.6.2)

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

IEM BCAR 04 18.8.4.2 Air traffic services system
(See BCAR 04 18.8.4.2)

ADIZ procedures may be described in the chart legend.

IEM BCAR 04 18.8.5 Radio navigation aids
(See BCAR 04 18.8.5)

Radio aids to navigation may be shown by the appropriate symbol and named.

SUBPART S
PLOTTING CHART — ICAO

IEM BCAR 04 19.2 Availability
(See BCAR 04 19.2)

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

IEM BCAR 04 19.3 Coverage and scale
(See BCAR 04 19.3)

Normally the scale will range from 1:3 000 000 to 1:7 500 000.

IEM BCAR 04 19.7.3 Culture and topography
(See BCAR 04 19.7.3)

Large cities and towns may be shown.

IEM BCAR 04 19.9.1 Aeronautical data
(See BCAR 04 19.9.1)

Other aeronautical data may be shown provided that they do not detract from the legibility of essential information.

SUBPART T
ELECTRONIC AERONAUTICAL CHART DISPLAY

IEM BCAR 04 20.2.2 Information available for display
(See BCAR 04 20.2.2)

The Electronic Aeronautical Chart Display — ICAO may display supplementary information, in addition to that required for the equivalent paper chart, which may be considered useful for safe navigation.

IEM BCAR 04 20.3.2.1 Display mode and generation of neighbouring area
(See BCAR 04 20.3.2.1)

Other modes, such as static chart displays, may be available.

IEM BCAR 04 20.3.4 Symbols
(See BCAR 04 20.3.4)

Additional details for each symbol may be added according to the resolution of the output media, but any enhancements may not change the basic recognizability of the symbol.

IEM BCAR 04 20.4.1 Provision and updating of data
(See BCAR 04 20.4.1)

For aeronautical data quality system requirements, see BCAR 04 Subpart B, 2.17, and BCAR 15, Subpart C, 3.2.

IEM BCAR 04 20.6 Back-up arrangements
(See BCAR 04 20.6)

A suitable back-up system may include the carriage of paper charts.

SUBPART U
ATC SURVEILLANCE MINIMUM ALTITUDE CHART

IEM BCAR 04 21.1.1 Function
(See BCAR 04 21.1.1)

The objectives of the air traffic control service as prescribed in BCAR ATS do not include prevention of collision with terrain. The procedures prescribed in the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444) do not relieve pilots of their responsibility to ensure that any clearances issued by air traffic control units are safe in this respect. When an IFR flight is vectored or is given a direct routing which takes the aircraft off an ATS route, the PANS-ATM, Chapter 8, 8.6.5.2, applies.

IEM BCAR 04 21.5 Identification
(See BCAR 04 21.5)

The name may be that of the city which the aerodrome serves or, when the procedures apply to more than one aerodrome, that of the air traffic services centre or the largest city or town situated in the area covered by the chart.

IEM BCAR 04 21.6.2 Culture and topography
(See BCAR 04 21.6.2)

Appropriate spot elevations and obstacles are those provided by the Procedures Specialist.

IEM BCAR 04 21.9.3.1 (c) Air traffic services system
(See BCAR 04 21.9.3.1(c))

Routes used in the vectoring of aircraft to and from the significant points may be shown.

IEM BCAR 04 21.9.3.1(e)(2)
(See BCAR 04 21.9.3.1(e)(2))

In congested areas, geographical coordinates may be omitted in the interest of legibility.