BELIZE

DEPARTMENT OF

CIVIL AVIATION

BELIZE CIVIL AVIATION REGULATIONS
AERONAUTICAL CHARTS
BCAR 4

First issue
Revision: 0
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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

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Preamble

The BCAR 4 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.

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SECTION 1-REQUIREMENTS

Presentation and generalities

1 PRESENTATION

1.1 Section one of BCAR 4 is presented in double columns. Each page is identified by its edition or amendment date that was incorporated.

1.2 This section Font is arial 10.

2 INTRODUCTION

2.1.1 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, 56th amendment, 18 November 2010, issued and published by the International Civil Aviation Organization (ICAO).

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SUBPART A

CHAPTER 1 - DEFINITIONS, APPLICABILITY AND AVAILABILITY

BCAR ATS 1.1 Definitions

When the following terms are used in this regulation, they have the following meanings:

Aerodrome. A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft..

Aerodrome elevation. The elevation of the highest point of the landing area.

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

a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;

b) landing in precision approach and landing operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the category of the operation;

c) landing in approach and landing operations with vertical guidance, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H); and

d) landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions.

Aerodrome reference point. The designated geographical location of an aerodrome.

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

Aircraft stand. A designated area on an apron intended to be used for parking an aircraft.

Air defence identification zone. Special designated airspace of defined dimensions within which aircraft are required to comply with special identification and/or reporting procedures additional to those related to the provision of air traffic services (ATS).

Air traffic service. A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

Air transit route. A defined route for the air transiting of helicopters.

Airway. A control area or portion thereof established in the form of a corridor.

Altitude. The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).

Application. Manipulation and processing of data in support of user requirements (ISO 19104*).

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

Area minimum altitude (AMA). The minimum altitude to be used under instrument meteorological conditions (IMC) that provides a minimum obstacle clearance within a specified area, normally formed by parallels and meridians.

Area navigation (RNAV). A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.
(See IEM ATS 1.0)

Arrival routes. Routes identified in an instrument approach procedure by which aircraft may proceed from the en-route phase of flight to an initial approach fix.

ATS route. A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services.
(See IEM ATS 1.0)

ATS surveillance system. A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft
(See IEM ATS 1.0)

Bare Earth. Surface of the Earth including bodies of water and permanent ice and snow, and excluding vegetation and man-made objects.

Calendar. Discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day (ISO 19108*).
(See IEM ATS 1.0)

Canopy. Bare Earth supplemented by vegetation height.

Change-over point. The point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft.
(See IEM ATS 1.0)

Clearway. A defined rectangular area on the ground or water under the control of the appropriate authority selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.

Competent authority (CA): Civil Aviation authority or organization(s) or designated person(s) who have been coferred the necessary competence through the corresponding legal provisions.

Contour line. A line on a map or chart connecting points of equal elevation.

Culture. All man-made features constructed on the surface of the Earth, such as cities, railways and canals.

Cyclic redundancy checks (CRC). A mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data.

Danger area. An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Data product specification. Detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party (ISO 19131*).
(See IEM ATS 1.0)

Data quality. A degree or level of confidence that the data provided meet the requirements of the data user in terms of accuracy, resolution and integrity.

Data set. Identifiable collection of data (ISO 19101*).
(See IEM ATS 1.0)

Data set series. Collection of data sets sharing the same product specification (ISO 19115*).
(See IEM ATS 1.0)

Datum. Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities (ISO 19104*).
(See IEM ATS 1.0)

Digital Elevation Model (DEM). The representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum
(See IEM ATS 1.0)

Displaced threshold. A threshold not located at the extremity of a runway.

Electronic aeronautical chart display. An electronic device by which flight crews are enabled to execute, in a convenient and timely manner, route planning, route monitoring and navigation by displaying required information.

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

Ellipsoid height (Geodetic height). The height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.

Feature. Abstraction of real world phenomena (ISO 19101*).

(See IEM ATS 1.0)

Feature attribute. Characteristic of a feature (ISO 19101*).
(See IEM ATS 1.0)

Final approach. That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,

a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or

b) at the point of interception of the last track specified in the approach procedure; and

ends at a point in the vicinity of an aerodrome from which:

1) a landing can be made; or

2) a missed approach procedure is initiated.

Final approach and take-off area (FATO). A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by performance Class 1 helicopters, the defined area includes the rejected take-off area available.

Final approach fix or point. That fix or point of an instrument approach procedure where the final approach segment commences.

Final approach segment. That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

Flight information region. An airspace of defined dimensions within which flight information service and alerting service are provided.

Flight level. A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.
(See IEM ATS 1.0)

Geodesic distance. The shortest distance between any two points on a mathematically defined ellipsoidal surface.

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

Geoid. The equipotential surface in the gravity field of the Earth which coincides with the undisturbed mean sea level (MSL) extended continuously through the continents.
(See IEM ATS 1.0)

Geoid undulation. The distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid.
(See IEM ATS 1.0)

Glide path. A descent profile determined for vertical guidance during a final approach.

Gregorian calendar. Calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar (ISO 19108*).
(See IEM ATS 1.0)

Height. The vertical distance of a level, a point or an object considered as a point, measured from a specified datum.

Helicopter stand. An aircraft stand which provides for parking a helicopter and where ground taxi operations are completed or where the helicopter touches down and lifts off for air taxi operations.

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

Holding procedure. A predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance.

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

Human Factors principles. Principles which apply to aeronautical design, certification, training,

operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

Hypsometric tints. A succession of shades or colour gradations used to depict ranges of elevation.

Initial approach segment. That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.

Instrument approach procedure. A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply.

Intermediate approach segment. That segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, racetrack or dead reckoning track procedure and the final approach fix or point, as appropriate.

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

Isogonal. A line on a map or chart on which all points have the same magnetic variation for a specified epoch.

Isogriv. A line on a map or chart which joins points of equal angular difference between the North of the navigation grid and Magnetic North

Landing area. That part of a movement area intended for the landing or take-off of aircraft.

Landing direction indicator. A device to indicate visually the direction currently designated for landing and for take-off.

Level. A generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level.

Logon address. A specified code used for data link logon to an ATS unit.

Magnetic variation. The angular difference between True North and Magnetic North.
(See IEM ATS 1.0)

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

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

Metadata. Data about data (ISO 19115*).
(See IEM ATS 1.0)

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

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

Minimum sector altitude. The lowest altitude which may be used which will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an area contained within a sector of a circle of 46 km (25 NM) radius centred on a radio aid to navigation.

Missed approach point (MAPt). That point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed.

Missed approach procedure. The procedure to be followed if the approach cannot be continued.

Movement area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).

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

Required navigation performance (RNP) specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

Area navigation (RNAV) specification. A navigation specification based on area navigation that does not include therequirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.
(See IEM ATS 1.0)

Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

a) are located on an area intended for the surface movement of aircraft; or

b) extend above a defined surface intended to protect aircraft in flight; or

c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.
(See IEM ATS 1.0)

Obstacle clearance altitude (OCA) or obstacle clearance height (OCH). The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable used in establishing compliance with appropriate obstacle clearance criteria.
(See IEM ATS 1.0)

Obstacle free zone (OFZ). The airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.

Orthometric height. Height of a point related to the geoid, generally presented as an MSL elevation.

Performance-based navigation (PBN). Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.
(See IEM ATS 1.0)

Point light. A luminous signal appearing without perceptible length.

Portrayal. Presentation of information to humans (ISO 19117*).
(See IEM ATS 1.0)

Position (geographical). Set of coordinates (latitude and longitude) referenced to the mathematical reference ellipsoid which define the position of a point on the surface of the Earth.

Precision approach procedure. An instrument approach procedure utilizing azimuth and glide path information provided by ILS or PAR.

Procedure altitude/height. A specified altitude/height flown operationally at or above the minimum altitude/height and established to accommodate a stabilized descent at a prescribed descent gradient/angle in the intermediate/final approach segment.

Procedure turn. A manoeuvre in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track.
(See IEM ATS 1.0)

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

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

Reporting point. A specified (named) geographical location in relation to which the position of an aircraft can be reported.
(See IEM ATS 1.0)

Resolution. A number of units or digits to which a measured or calculated value is expressed and used.

Restricted area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

Reversal procedure. A procedure designed to enable aircraft to reverse direction during the initial approach segment of an instrument approach procedure. The sequence may include procedure turns or base turns.

Runway. A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

Runway-holding position. A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower.
(See IEM ATS 1.0)

Runway strip. A defined area including the runway and stopway, if provided, intended:

a) to reduce the risk of damage to aircraft running off a runway; and

b) to protect aircraft flying over it during take-off or landing operations.

Runway visual range (RVR). The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

Shoulder. An area adjacent to the edge of a pavement so prepared as to provide a transition between the pavement and the adjacent surface.

Significant point. A specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes.
(See IEM ATS 1.0)

Stopway. A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

Taxiing. Movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.

Taxi-route. A defined path established for the movement of helicopters from one part of a heliport to another. A taxi-route includes a helicopter air or ground taxiway which is centred on the taxi-route.

Taxiway. A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

a) *Aircraft stand taxilane.* A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.

b) *Apron taxiway.* A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron.

c) *Rapid exit taxiway.* A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.

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

Terrain. The surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles.
(See IEM ATS 1.0)

Threshold. The beginning of that portion of the runway usable for landing.

Touchdown and lift-off area (TLOF). A load bearing area on which a helicopter may touch down or lift off.

Touchdown zone. The portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway.

Track. The projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid).

Transition altitude. The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.

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

Visual approach procedure. A series of predetermined manoeuvres by visual reference, from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, a go-around procedure can be carried out.

Waypoint. A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:

Fly-by waypoint. A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure; or

Flyover waypoint. A waypoint at which a turn is initiated in order to join the next segment of a route or procedure.

BCAR 4 1.2 Applicability

BCAR 4 1.2.1 The specifications in this Regulation are applicable on and after its official publication.
(See IEM 4 1.2.1)

BCAR 4 1.2.2 All charts coming within the scope of this Regulation and bearing the aeronautical information date according to BCAR 4 1.2.1or later shall conform to the Standards relevant to the particular chart.

BCAR 4 1.2.2.1 All such charts should in addition conform to this regulation relevant to the particular chart.

BCAR 4 1.3 Availability

BCAR 4 1.3.1 Information

The Competent Authority shall provide all the necessary information regarding the territory under its responsibility when requested by another State or competent authority

BCAR 4 1.3.2 Charts

The competent authority shall ensure, where specified, the availability of charts by any means appropriate for a chart or a single sheet of a series of letters.
(See IEM 4 1.3.2)

BCAR 4 1.3.2.1 Reserved

BCAR 4 1.3.2.2 Reserved

BCAR 4 1.3.3 Guarantee and quality of charts

The charts are prepared taken all reasonable steps to ensure that the information they provide and aeronautical charts available are adequate and accurate and that they are maintained up to date by an adequate revision service.
(See IEM 4 1.3.3)

BCAR 4 1.3.4 Reserved

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SUBPART B

CHAPTER 2 - GENERAL SPECIFICATIONS

(See IEM 4 chapter 2)

BCAR 4 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 4 2.1.1 Human Factors principles

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 4 2.1.1)

BCAR 4 2.1.2 Requirements for charts

Letters must meet the following requirements:

a) Each type of chart shall provide information appropriate to the phase of flight to ensure the safe and expeditious operation of the aircraft.

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

c) 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.

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

e) 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.

f) The charts should be True North orientated.

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

BCAR 4 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 chapter heading as modified by application of any Standard contained therein, except that such title shall not include “ICAO” unless the chart conforms with all Standards specified in this Chapter 2 and any specified for the particular chart.

BCAR 4 2.3 Miscellaneous information

BCAR 4 2.3.1 The marginal note

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

BCAR 4 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:
(See IEM BCAR 4 2.3.2)
a) designation or title of the chart series;
b) name and reference of the sheet;
c) on each margin an indication of the adjoining sheet (when applicable).

BCAR 4 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 4 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 4 2.4 Symbols

BCAR 4 2.4.1 Chart symbols

The Symbols used shall conform to those listed in Appendix 2 - 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 are not available at present of a symbol, the Administrator must choose an appropriate symbol, if not cause confusion with any existing cartographic symbol or impair the legibility of the chart.
(See IEM BCAR 4 2.4.1)

BCAR 4 2.4.1.1 The size and prominence of symbols and the thickness and spacing of lines

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.

BCAR 4 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 4 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 4 2.4.4 Significant points

In the elaboration of aeronautical charts must be ensured that the symbols shown are in the manner specified in paragraphs BCAR 4 2.4.2 and BCAR 4 2.4.3 and Appendix 2 Symbols cartographic set out in this BCAR.

BCAR 4 2.4.5 Reserved

BCAR 4 2.5 Units of measurement

BCAR 4 2.5.1 Distances shall be derived as geodesic distances.

BCAR 4 2.5.2 Distances shall be expressed in either kilometres or nautical miles or both, provided the units are clearly differentiated.

BCAR 4 2.5.3 Altitudes, elevations and heights shall be expressed in either metres or feet or both, provided the units are clearly differentiated.

BCAR 4 2.5.4 Linear dimensions on aerodromes and short distances shall be expressed in metres.

BCAR 4 2.5.5 The order of resolution of distances, dimensions, elevations and heights shall be that as specified for a particular chart.
BCAR 4 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 4 2.5.7 Conversion scales (kilometres/nauticalmiles, 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 4 2.6 Scale and projection

BCAR 4 2.6.1 For charts of large areas, the name and basic parameters and scale of the projection shall be indicated.

BCAR 4 2.6.2 For charts of small areas, a linear scale only shall be indicated.

BCAR 4 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 4 2.8 Spelling of geographical names

BCAR 4 2.8.1 The symbols of the Roman alphabet shall be used for all writing.

BCAR 4 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 4 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 4 2.8.4 Reserved

BCAR 4 2.9 Abbreviations

BCAR 4 2.9.1 Abbreviations shall be used on aeronautical charts whenever they are appropriate.

BCAR 4 2.9.2 Where applicable, abbreviations should be selected from the Procedures for Air Navigation Services Abbreviations and Codes (ICAO Doc 8400).

BCAR 4 2.10 Political boundaries

BCAR 4 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 4 2.10.2 Where the territory of more than one State appears on a chart, the names identifying the countries shall be indicated.
(See IEM BCAR 4 2.10.1)

BCAR 4 2.11 Colours

Colours used on charts should conform to Appendix 3 — Colour Guide.

BCAR 4 2.12 Relief

BCAR 4 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.

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

BCAR 4 2.12.3 Where spot elevations are used, they shall be shown for selected critical points.

BCAR 4 2.12.3.1 The value of spot elevations of doubtful accuracy shall be followed by the sign ±.

BCAR 4 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.

BCAR 4 2.14 Air traffic services airspaces

BCAR 4 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 Appendix 2 — Chart Symbols.

BCAR 4 2.14.2 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 should be on the face or reverse of each chart.

BCAR 4 2.15 Magnetic variation

BCAR 4 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 4 2.15.2 When magnetic variation is shown on a chart, the values shown should be those for the year nearest to the date of publication that is divisible by 5, i.e. 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 should be quoted.
(See IEM BCAR 4 2.15.2)

BCAR 4 2.15.3 For instrument procedure charts, the publication of a magnetic variation change should be completed within a maximum of six AIRAC cycles.

BCAR 4 2.15.4 In large terminal areas with multiple aerodromes, a single rounded value of magnetic variation should be applied so that the procedures that service multiple aerodromes use a single,

common variation value.

BCAR 4 2.16 Typography

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

BCAR 4 2.17 Aeronautical data

BCAR 4 2.17.1 All the necessary measures to introduce a properly organized quality system shall be taken into consideration containing procedures, processes and resources necessary to implement quality management at each function stage as outlined in BCAR 15 3.1.7. The execution of such quality management shall be made demonstrable for each function stage, when required. In addition, 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 4 2.17.1)

BCAR 4 2.17.2 The order of chart resolution of aeronautical data shall be that as specified for a particular chart and as presented in a tabular form in Appendix 6 of this BCAR.

BCAR 4 2.17.3 Integrity of aeronautical data is maintained throughout the data process from survey/origin to the next intended user. Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classification and data integrity level shall apply:

a) critical data, integrity level 1×10^{-8}: there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;

b) essential data, integrity level 1×10^{-5}: there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and

c) routine data, integrity level 1×10^{-3}: there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

BCAR 4 2.17.4 Aeronautical data quality requirements related to the integrity and data classification shall be as provided in Tables 1 to 6 in Appendix 6.

BCAR 4 2.17.5 Electronic aeronautical data sets shall be protected by the inclusion in the data sets of a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets. This shall apply to the protection of all integrity levels of data sets as specified in BCAR 4 2.17.3.
(See IEM BCAR 4 2.17.5)

BCAR 4 2.18 Common reference systems

BCAR 4 2.18.1 Horizontal reference system

BCAR 4 2.18.1.1 World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system. Published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

BCAR 4 2.18.1.2 Geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in BCAR ATS, Chapter 2, and BCAR 14, Volumes I and II, Chapter 2, shall be identified by an asterisk.

BCAR 4 2.18.1.3 The order of chart resolution of geographical coordinates shall be that specified for a particular chart series and in accordance with Appendix 6, Table 1.

BCAR 4 2.18.2 Vertical reference system

BCAR 4 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.

BCAR 4 2.18.2.2 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.

BCAR 4 2.18.2.3 The order of chart resolution of elevation and geoid undulation shall be that specified for a particular chart series and in accordance with Appendix 6, Table 2.

BCAR 4 2.18.3 Temporary reference system

BCAR 4 2.18.3.1 The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system.

BCAR 4 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 Aeronautical Information Publication (AIP).

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SUBPART C

CHAPTER 3 - AERODROME OBSTACLE CHART - TYPE A (OPERATING LIMITATIONS)

BCAR 4 3.1 Function

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

BCAR 4 3.2 Availability

BCAR 4 3.2.1 shall be made available in the manner prescribed in BCAR 4 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.

BCAR 4 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 AIP.

BCAR 4 3.3 Units of measurement

BCAR 4 3.3.1 Elevations shall be shown to the nearest half-metre or to the nearest foot.

BCAR 4 3.3.2 Linear dimensions shall be shown to the nearest half-metre.

BCAR 4 3.4 Coverage and scale

BCAR 4 3.4.1 The extent of each plan shall be sufficient to cover all obstacles.
(See IEM BCAR 4 3.4.1)

BCAR 4 3.4.2 The horizontal scale shall be within the range of 1:10 000 to 1:15 000.

BCAR 4 3.4.3 As far as possible horizontal scale should be 1:10 000.
(See IEM BCAR 4 3.4.3)

BCAR 4 3.4.4 The vertical scale shall be ten times the horizontal scale.

BCAR 4 3.4.5 Linear scales. Horizontal and vertical linear scales showing both metres and feet shall be included in the charts.

BCAR 4 3.5 Format

BCAR 4 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 4 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 4 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 4 3.5.3.1 The vertical grid should have intervals of 30 m (100 ft) and the horizontal grid should have intervals of 300 m (1 000 ft).

BCAR 4 3.5.4 the chart shall include:

a) a box for recording the operational data specified in BCAR 4 3.8.3;

b) a box for recording amendments and dates thereof.

BCAR 4 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 4 3.7 Magnetic variation

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

BCAR 4 3.8 Aeronautical data

BCAR 4 3.8.1 Obstacles

BCAR 4 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 that obstacles lying wholly below the shadow of other obstacles as defined in BCAR 4 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 4 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 4 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 4 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 4 3.8.2 Take-off flight path area

BCAR 4 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 4 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 4 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 4 3.8.1.1 and BCAR 4 3.8.1.2 shall be reduced to 1.0 per cent or less.
(See IEM BCAR 4 3.8.2.2)

BCAR 4 3.8.3 Declared distances

BCAR 4 3.8.3.1 The following information for each direction of each runway shall be entered in the space provided:
(See IEM BCAR 4 3.8.3.1)

a) take-off run available;

b) accelerate-stop distance available;

c) take-off distance available;

d) landing distance available.

BCAR 4 3.8.3.2 Where a declared distance is not provided because a runway is usable in one direction only, that runway should be identified as “not usable for take-off, landing or both”.

BCAR 4 3.8.4 Plan and profile views

BCAR 4 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 4 3.8.4.1)

BCAR 4 3.8.4.1.1 The nature of the runway and stopway surfaces should be indicated.

BCAR 4 3.8.4.1.2 Stopways should be identified as such and should be shown by a broken line.

BCAR 4 3.8.4.1.3 When stopways are shown, the length of each stopway shall be indicated.

BCAR 4 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 4 3.8.4.2)

BCAR 4 3.9 Accuracy

BCAR 4 3.9.1 The order of accuracy attained shall be shown on the chart.

BCAR 4 3.9.2 The horizontal dimensions and the elevations of the runway, stopway and clearway to be printed on the chart should be determined to the nearest 0.5 m (1 ft).

BCAR 4 3.9.3 The order of accuracy of the field work and the precision of chart production should 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 4 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

CHAPTER 4 - AERODROME OBSTACLE CHART — TYPE B

BCAR 4 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 4 4.2 Availability

BCAR 4 4.2.1 Aerodrome Obstacle Charts — ICAO Type B should be made available, in the manner prescribed in BCAR 4 1.3.2.

BCAR 4 4.2.2 When a chart combining the specifications of Chapters B and C is made available, it shall be called the Aerodrome Obstacle Chart — (Comprehensive).

BCAR 4 4.3 Units of measurement

BCAR 4 4.3.1 Elevations shall be shown to the nearest half-metre or to the nearest foot.

BCAR 4 4.3.2 Linear dimensions shall be shown to the nearest half-metre.

BCAR 4 4.4 Coverage and scale

BCAR 4 4.4.1 The extent of each plan shall be sufficient to cover all obstacles.
(See IEM BCAR 4 4.4.1)

BCAR 4 4.4.2 The horizontal scale shall be within the range of 1:10 000 to 1:20 000.

BCAR 4 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 4 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 surface specified in BCAR 14, Volumen I, Chapter 4;

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 4 4.5)

BCAR 4 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 4 4.7 Culture and topography

BCAR 4 4.7.1 Drainage and hydrographic details shall be kept to a minimum.

BCAR 4 4.7.2 Buildings and other salient features associated with the aerodrome shall be shown. Wherever possible, they shall be shown to scale.

BCAR 4 4.7.3 All objects, either cultural or natural, that project above the take-off and approach surfaces specified in BCAR 4 4.9 or the clearing and marking surfaces specified in BCAR 14, Volume I, Chapter 4, shall be shown.

BCAR 4 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 4 7.4)

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 4 4.9 Aeronautical data

BCAR 4 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 4 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 4 4.9.1)

n) any additional obstacles, as determined by BCAR 3.8.1.1 including the obstacles in the shadow of an obstacle, which would otherwise be exempted.
(See IEM BCAR 4 4. 9.1)

BCAR 4 4.9.1.1 The nature of the runway and stopway surfaces should be given.

BCAR 4 4.9.1.2 Wherever practicable, the highest object or obstacle between adjacent approach areas within a radius of 5 000 m (15 000 ft) from the aerodrome reference point should be indicated in a prominent manner.

BCAR 4 4.9.1.3 The extent of tree areas and relief features, part of which constitute obstacles, should be shown.

BCAR 4 4.10 Accuracy

BCAR 4 4.10.1 The order of accuracy attained shall be shown on the chart.

BCAR 4 4.10.2 The horizontal dimensions and the elevations of the movement area, stopways and clearways to be printed on the chart should be determined to the nearest 0.5 m (1 ft).

BCAR 4 4.10.3 The order of accuracy of the field work and the precision of chart production should 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 4 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

CHAPTER 5 - AERODROME TERRAIN AND OBSTACLE CHART — (ELECTRONIC)

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SUBPART F

CHAPTER 6 - PRECISION APPROACH TERRAIN

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SUBPART G

CHAPTER 7 - ENROUTE CHART

BCAR 4 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 4 7.1)

BCAR 4 7.2 Availability

BCAR 4 7.2.1 shall be made available in the manner prescribed in BCAR 4 1.3.2 for all areas where flight information regions have been established.
(See IEM BCAR 4 7.2.1)

BCAR 4 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 4 7.3 Coverage and scale
(See IEM BCAR 4 7.3)

BCAR 4 7.3.1 Layout of sheet lines should be determined by the density and pattern of the ATS route structure.

BCAR 4 7.3.2 Large variations of scale between adjacent charts showing a continuous route structure shall be avoided.

BCAR 4 7.3.3 An adequate overlap of charts shall be provided to ensure continuity of navigation.

BCAR 4 7.4 Projection

BCAR 4 7.4.1 A conformal projection on which a straight line approximates a great circle should be used.

BCAR 4 7.4.2 Parallels and meridians shall be shown at suitable intervals.

BCAR 4 7.4.3 Graduation marks shall be placed at consistent intervals along selected parallels and meridians.

BCAR 4 7.5 Identification

Each sheet shall be identified by chart series and number.

BCAR 4 7.6 Culture and topography

BCAR 4 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 4 7.6.2 Within each quadrilateral formed by the parallels and meridians, the area minimum altitude shall be shown, except as provided for in BCAR 4 7.6.3.

BCAR 4 7.6.3 In areas of high latitude where it is determined by the appropriate authority that True North orientation of the chart is impractical, the area minimum altitude should be shown within each quadrilateral formed by reference lines of the graticule (grid) used.

BCAR 4 7.6.4 Where charts are not True North orientated, this fact and the selected orientation used shall be clearly indicated.

BCAR 4 7.7 Magnetic variation

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

BCAR 4 7.8 Bearings, tracks and radials

BCAR 4 7.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in BCAR 4 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 4 7.8.2 Reserved

BCAR 4 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 4 7.9 Aeronautical data

BCAR 4 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 4 7.9.1)

BCAR 4 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 4 7.9.3 Air traffic services system

BCAR 4 7.9.3.1 Where appropriate, the components of the established air traffic services system shall be shown.

BCAR 4 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;

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 4 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 4 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;

l) air defence identification zone (ADIZ) properly identified.
(See IEM BCAR 4 7.9.3.1.1(l))

BCAR 4 7.9.4 Reserved

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SUBPART H

CHAPTER 8 - AREA CHART

BCAR 4 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 4 8.1(c))

BCAR 4 8.2 Availability

BCAR 4 8.2.1 The Area Chart shall be made available in the manner prescribed in BCAR 4 1.3.2 where the air traffic services routes or position reporting requirements are complex and cannot be adequately shown on an Enroute Chart .

BCAR 4 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.

Under certain conditions, a Standard Departure Chart — Instrument (SID) and a Standard Arrival Chart — Instrument (STAR) may have to be provided (see Chapter 9 and chapter 10).

BCAR 4 8.3 Coverage and scale

BCAR 4 8.3.1 The coverage of each chart shall extend to points that effectively show departure and arrival routes.

BCAR 4 8.3.2 The chart shall be drawn to scale and a scale-bar shown.

BCAR 4 8.4 Projection

BCAR 4 8.4.1 A conformal projection on which a straight line approximates a great circle should be used.

BCAR 4 8.4.2 Parallels and meridians shall be shown at suitable intervals.

BCAR 4 8.4.3 Graduation marks shall be placed at consistent intervals along the neat lines, as appropriate.

BCAR 4 8.5 Identification

The chart shall be identified by a name associated with the airspace portrayed.
(See IEM BCAR 4 8.5)

BCAR 4 8.6 Culture and topography

BCAR 4 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 4 8.6.2 To improve situational awareness in areas where significant relief exists, all relief exceeding 300 m (1 000 ft) above the elevation of the primary aerodrome should be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, should be shown printed in black. Obstacles should also be shown.
(See IEM BCAR 4 8.6.2)

BCAR 4 8.7 Magnetic variation

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

BCAR 4 8.8 Bearings, tracks and radials

BCAR 4 8.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in BCAR 4 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 4 8.8.2 Reserved

BCAR 4 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 4 8.9 Aeronautical data

BCAR 4 8.9.1 Aerodromes

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

BCAR 4 8.9.2 Prohibited, restricted and danger areas

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

BCAR 4 8.9.3 Area minimum altitudes

Area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians.
(See IEM BCAR 4 8.9.3)

BCAR 4 8.9.4 Air traffic services system

BCAR 4 8.9.4.1 The components of the established relevant air traffic services system shall be shown.

BCAR 4 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 4 8.9.4(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 4 8.9.4(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 4 8.9.4(m))

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

o) communication facilities listed with their channels and, if applicable, logon address.

p) an indication of "flyover" significant points.

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SUBPART I

CHAPTER 9 - STANDARD DEPARTURE CHART INSTRUMENT (SID)

BCAR 4 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 4 9.1)

BCAR 4 9.2 Availability

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

BCAR 4 9.3 Coverage and scale

BCAR 4 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 4 9.3.1)

BCAR 4 9.3.2 the chart should be drawn to scale.

BCAR 4 9.3.3 If the chart is drawn to scale, a scale-bar shall be shown.

BCAR 4 9.3.4 When the chart is not drawn to scale, the annotation “NOT TO SCALE” shall be shown and the symbol for scalebreak shall be used on tracks and other aspects of the chart which are too large to be drawn to scale.

BCAR 4 9.4 Projection

BCAR 4 9.4.1 A conformal projection on which a straight line approximates a great circle should be used.

BCAR 4 9.4.2 When the chart is drawn to scale, parallels and meridians should be shown at suitable intervals.

BCAR 4 9.4.3 Graduation marks shall be placed at consistent intervals along the neat lines.

BCAR 4 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 4 9.5)

BCAR 4 9.6 Culture and topography

BCAR 4 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 4 9.6.2 To improve situational awareness in areas where significant relief exists, the chart should be drawn to scale and all relief exceeding 300 m (1 000 ft) above the aerodrome elevation should be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, should be shown printed in black. Obstacles should also be shown.
(See IEM BCAR 4 9.6.2)

BCAR 4 9.7 Magnetic variation

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

BCAR 4 9.8 Bearings, tracks and radials

BCAR 4 9.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in

BCAR 4 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 4 9.8.1)

BCAR 4 9.8.2 Reserved

BCAR 4 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 4 9.9 Aeronautical data

BCAR 4 9.9.1 Aerodromes

BCAR 4 9.9.1.1 The aerodrome of departure shall be shown by the runway pattern.

BCAR 4 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 4 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 4 9.9.3 Minimum sector altitude

BCAR 4 9.9.3.1 The established minimum sector altitude, based on a navigation aid associated with the procedure shall be shown with a clear indication of the sector to which it applies.

BCAR 4 9.9.3.2 Where the minimum sector altitude has not been established, the chart shall be drawn to scale and area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians. Area minimum altitudes shall also be shown in those parts of the chart not covered by the minimum sector altitude.
(See IEM BCAR 4 9.9.3.2)

BCAR 4 9.9.4 Air traffic services system

BCAR 4 9.9.4.1 The components of the established relevant air traffic services system shall be shown.

BCAR 4 9.9.4.1.1 The components shall comprise the following:

a) a graphic portrayal of each standard departure 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 departure is provided, established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;
(See IEM BCAR 4 9.9.4.1.1(a)(6))

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

1) plain language name;

2) identification;

3) frequency;

4) geographical coordinates in degrees, minutes and seconds;

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

c) the name-codes of the significant points not marked by the position of a radio navigation aid, their geographical coordinates in degrees, minutes and seconds and the bearing to the nearest tenth of a degree and distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference radio navigation aid;

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 4 9.9.4.1.1(f))

g) area speed restrictions, where established;

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

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

j) radio communication procedures, including:

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

2) frequency;

3) transponder setting, where appropriate;

k) an indication of “flyover” significant points.

BCAR 4 9.9.4.2 A textual description of standard departure route(s) — instrument (SID) and relevant communication failure procedures should be provided and should, whenever feasible, be shown on the chart or on the same page which contains the chart.

BCAR 4 9.9.4.3 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, 2.1, on the verso of the chart or as a separate, properly referenced sheet.
(See IEM BCAR 4 9.9.4.3)

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SUBPART J

CHAPTER 10 - STANDARD ARRIVAL CHART —INSTRUMENT (STAR) —

BCAR 4 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 4 10.1)

BCAR 4 10.2 Availability

The Standard Arrival Chart — Instrument (STAR) — 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 4 10.3 Coverage and scale

BCAR 4 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 4 10.3.2 The chart should be drawn to scale.

BCAR 4 10.3.3 If the chart is drawn to scale, a scale-bar shall be shown.

BCAR 4 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 4 10.4 Projection

BCAR 4 10.4.1 A conformal projection on which a straight line approximates a great circle should be used.

BCAR 4 10.4.2 When the chart is drawn to scale, parallels and meridians should be shown at suitable intervals.

BCAR 4 10.4.3 Graduation marks shall be placed at consistent intervals along the neat lines.

BCAR 4 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 ICAO *Procedures for Air Navigation Services* — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part I, Section 4, Chapter 2.

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

BCAR 4 10.6 Culture and topography

BCAR 4 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 4 10.6.2 To improve situational awareness in areas where significant relief exists, the chart should be drawn to scale and all relief exceeding 300 m (1 000 ft) above the aerodrome elevation should be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, should be shown printed in black. Obstacles should also be shown.
(See IEM BCAR 4 10.6.2)

BCAR 4 10.7 Magnetic variation

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

BCAR 4 10.8 Bearings, tracks and radials

BCAR 4 10.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in

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 4 10.8.1)

BCAR 4 10.8.2 In areas of high latitude, where it is determined by the appropriate authority that referenceto Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, should be used.

BCAR 4 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 4 10.9 Aeronautical data

BCAR 4 10.9.1 Aerodromes

BCAR 4 10.9.1.1 The aerodrome of landing shall be shown by the runway pattern.

BCAR 4 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 4 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 4 10.9.3 Minimum sector altitude

BCAR 4 10.9.3.1 The established minimum sector altitude shall be shown with a clear indication of the sector to which it applies.

BCAR 4 10.9.3.2 Where the minimum sector altitude has not been established, the chart shall be drawn to scale and area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians. Area minimum altitudes shall also be shown in those parts of the chart not covered by the minimum sector altitude.
(See IEM BCAR 4 10.9.3.2)

BCAR 4 10.9.4 Air traffic services system

BCAR 4 10.9.4.1 The components of the established relevant air traffic services system shall be shown.

BCAR 4 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 tothe nearest higher 50 m or 100 ft, clearly identified;
(See IEM BCAR 4 10.9.4.1.1(a)(6))

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

1) plain language name;

2) identification;

3) frequency;

4) geographical coordinates in degrees, minutes and seconds;

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

c) the name-codes of the significant points not marked by the position of a radio navigation aid, their geographical coordinates in degrees, minutes and seconds and the bearing to the nearest tenth of a degree and distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference radio navigation aid;

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

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

i) radio communication procedures, including:

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

2) frequency;

3) transponder setting, where appropriate;

j) an indication of “flyover” significant waypoints.

BCAR 4 10.9.4.2 A textual description of standard arrival route(s) — instrument (STAR) and relevant communication failure procedures should be provided and should, whenever feasible, be shown on the chart or on the same page which contains the chart.

BCAR 4 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 4 10.9.4.3)

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SUBPART K

CHAPTER11 - INSTRUMENT APPROACH CHART

BCAR 4 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 4 11.1)

BCAR 4 11.2 Availability

BCAR 4 11.2.1 Instrument Approach Charts — shall be made available for all aerodromes used by international civil aviation where instrument approach procedures have been established by the State of Belize.

BCAR 4 11.2.2 A separate Instrument Approach Chart —shall normally be provided for each precision approach procedure established by the State of Belize.

BCAR 4 11.2.3 A separate Instrument Approach Chart —shall normally be provided for each non-precision approach procedure established by the State of Belize.
(See IEM BCAR 4 11.2.3)

BCAR 4 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 4 11.2.4)

BCAR 4 11.2.5 Instrument Approach Charts shall be revised whenever information essential to safe operation becomes out of date.

BCAR 4 11.3 Coverage and scale

BCAR 4 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 4 11.3.2 The scale selected shall ensure optimum legibility consistent with:

a) the procedure shown on the chart;

b) sheet size.

BCAR 4 11.3.3 A scale indication shall be given.

BCAR 4 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 4 11.3.3.2 A distance scale should be shown directly below the profile.

BCAR 4 11.4 Format

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

BCAR 4 11.5 Projection

BCAR 4 11.5.1 A conformal projection on which a straight line approximates a great circle shall be used.

BCAR 4 11.5.2 Graduation marks should be placed at consistent intervals along the neat lines.

BCAR 4 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.

The identification of the instrument approach procedure is provided by the procedures specialist.

BCAR 4 11.7 Culture and topography

BCAR 4 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 4 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 4 11.7.2)

BCAR 4 11.7.3 In areas where relief is lower than specified in BCAR 4 11.7.2, all relief exceeding 150 m (500 ft) above the aerodrome elevation should be shown by smoothed contour lines, contour values and layer tints printed in brown.
Appropriate spot elevations, including the highest elevation within each top contour line, should also be shown printed in black.
(See IEM BCAR 4 11.7.3)

BCAR 4 11.8 Magnetic variation

BCAR 4 11.8.1 The magnetic variation should be shown.

BCAR 4 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 4 11.9 Bearings, tracks and radials

BCAR 4 11.9.1 Bearings, tracks and radials shall be magnetic, except as provided for in BCAR 4 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 4 11.9.1)

BCAR 4 11.9.2 Reserved

BCAR 4 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 4 11.10 Aeronautical data

BCAR 4 11.10.1 Aerodromes

BCAR 4 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 4 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 4 11.10.1.3 The aerodrome elevation shall be shown to the nearest metre or foot in a prominent position on the chart.

BCAR 4 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 4 11.10.2 Obstacles

BCAR 4 11.10.2.1 Obstacles shall be shown on the plan view of the chart. (See IEM BCAR 4 11.10.2.1)

BCAR 4 11.10.2.2 If one or more obstacles are the determining factor of an obstacle clearance altitude/height, those obstacles should be identified.

BCAR 4 11.10.2.3 The elevation of the top of obstacles shall be shown to the nearest (next higher) metre or foot.

BCAR 4 11.10.2.4 The heights of obstacles above a datum other than mean sea level (see BCAR 4 11.10.2.3) should be shown. When shown, they should be given in parentheses on the chart.

BCAR 4 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 4 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 4 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 4 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 4 11.10.4 Radio communication facilities and navigation aids

BCAR 4 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 4 11.10.4.2 The initial approach fix (IAF), the intermediate approach fix (IF), the final approach fix (FAF) (or final approach point (FAP) for an ILS approach procedure), the missed approach point (MAPt), where established, and other essential fixes or points comprising the procedure shall be shown and identified.

BCAR 4 11.10.4.3 The final approach fix (or final approach point for an ILS approach procedure) should be identified with its geographical coordinates in degrees, minutes and seconds.

BCAR 4 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 4 11.10.4.5 Radio communication frequencies, including call signs that are required for the execution of the procedures shall be shown.

BCAR 4 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 4 11.10.5 Minimum sector altitude or terminal arrival altitude

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

BCAR 4 11.10.6 Portrayal of procedure tracks

BCAR 4 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 4 11.10.6.2 The plan view should show the distance to the aerodrome from each radio navigation aid concerned with the final approach.

BCAR 4 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 and procedure altitudes/heights, 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 4 11.10.6.4 Heights required by procedures should be shown in parentheses, using the height datum selected in accordance with BCAR 4 11.10.2.5.

BCAR 4 11.10.6.5 The profile view should 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 4 11.10.6.5)

BCAR 4 11.10.7 Aerodrome operating minima

BCAR 4 11.10.7.1 Aerodrome operating minima when established by the Competent Authority of Belize shall be shown.

BCAR 4 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 DL 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 4 11.10.8 Supplementary information

BCAR 4 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 4 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 4 11.10.8.3 For procedures in which DME is not required for use in the final approach segment but where a suitably located DME is available to provide advisory descent profile information, a table showing the altitudes/heights should be included.

BCAR 4 11.10.8.4 A rate of descent table should be shown.

BCAR 4 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 4 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 4 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 4 11.10.8.8 If the final approach descent gradient/angle for any type of instrument approach procedure exceeds the maximum value specified in the ICAO Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part I, Section 4, Chapter 5, a cautionary note shall be included.

BCAR 4 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 4 11.10.9)

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SUBPART L

CHAPTER12 - VISUAL APPROACH CHART

BCAR 4 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 4 12.2 Availability

The Visual Approach Chart shall be made available in the manner prescribed in BCAR 4 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 4 12.3 Scale

BCAR 4 12.3.1 The scale shall be sufficiently large to permit depiction of significant features and indication of the aerodrome layout.

BCAR 4 12.3.2 The scale should not be smaller than 1:500 000.
(See IEM BCAR 4 12.3.2)

BCAR 4 12.3.3 When an Instrument Approach Chart is available for a given aerodrome, the Visual Approach Chart should be drawn to the same scale

BCAR 4 12.4 Format

The sheet size should be 210 × 148 mm (8.27 × 5.82 in).
(See IEM BCAR 4 12.4)

BCAR 4 12.5 Projection

BCAR 4 12.5.1 A conformal projection on which a straight line approximates a great circle shall be used.

BCAR 4 12.5.2 Graduation marks should be placed at consistent intervals along the neat lines.

BCAR 4 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 4 12.7 Culture and topography

BCAR 4 12.7.1 Natural and cultural landmarks shall be shown (e.g. bluffs, cliffs, sand dunes, cities, towns, roads, railroads, isolated lighthouses).

BCAR 4 12.7.1.1 Geographical place names should be included only when they are required to avoid confusion or ambiguity.

BCAR 4 12.7.2 Shore lines, lakes, rivers and streams shall be shown.

BCAR 4 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 4 12.7.4 When shown, spot elevations should be carefully selected.
(See IEM BCAR 4 12.7.4)

BCAR 4 12.7.5 The figures relating to different reference levels shall be clearly differentiated in their presentation.

BCAR 4 12.8 Magnetic variation

The magnetic variation shall be shown.

BCAR 4 12.9 Bearings, tracks and radials

BCAR 4 12.9.1 Bearings, tracks and radials shall be magnetic except as provided for in BCAR 4 12.9.2.

BCAR 4 12.9.2 Reserved

BCAR 4 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 4 12.10 Aeronautical data

BCAR 4 12.10.1 Aerodromes

BCAR 4 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 4 12.10.1.2 The aerodrome elevation shall be shown in a prominent position on the chart.

BCAR 4 12.10.2 Obstacles

BCAR 4 12.10.2.1 Obstacles shall be shown and identified.

BCAR 4 12.10.2.2 The elevation of the top of obstacles shall be shown to the nearest (next higher) metre or foot.

BCAR 4 12.10.2.3 The heights of obstacles above the aerodrome elevation should be shown.

BCAR 4 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 4 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 4 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 4 12.10.5 Visual approach information

BCAR 4 12.10.5.1 Visual approach procedures shall be shown where applicable.

BCAR 4 12.10.5.2 Visual aids for navigation shall be shown as appropriate.

BCAR 4 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 isplacement, i.e. left or right, shall be shown.

BCAR 4 12.10.6 Supplementary information

BCAR 4 12.10.6.1 Radio navigation aids together with their frequencies and identifications shall be shown as appropriate.

BCAR 4 12.10.6.2 Radio communication facilities with their frequencies shall be shown as appropriate.

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SUBPART M

CHAPTER13 - AERODROME/HELIPORT CHART

BCAR 4 13.1 Function

This chart shall provide flight crews with information which will facilitate the ground movement of aircraft:

a) from the aircraft stand to the runway; and

b) from the runway to the aircraft stand;

and helicopter movement:

a) from the helicopter stand to the touchdown and lift-off area and to the final approach and take-off area;

b) from the final approach and take-off area to the touchdown and lift-off area and to the helicopter stand;

c) along helicopter ground and air taxiways; and

d) along air transit routes;

it shall also provide essential operational information at the aerodrome/heliport.

BCAR 4 13.2 Availability

BCAR 4 13.2.1 The Aerodrome/Heliport Chart shall be made available in the manner prescribed in BCAR 4 1.3.2 for all aerodromes/heliports regularly used by international civil aviation.

BCAR 4 **13.2.2** The Aerodrome/Heliport Chart should be made available also, in the manner prescribed in BCAR 4 1.3.2, for all other aerodromes/heliports available for use by international civil aviation.
(See IEM BCAR 4 13.2.2)

BCAR 4 13.3 Coverage and scale

BCAR 4 13.3.1 The coverage and scale shall be sufficiently large to show clearly all the elements listed in BCAR 4 13.6.1.

BCAR 4 13.3.2 A linear scale shall be shown.

BCAR 4 13.4 Identification

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

BCAR 4 13.5 Magnetic variation

True and Magnetic North arrows and magnetic variation to the nearest degree and annual change of the magnetic variation shall be shown.

BCAR 4 13.6 Aerodrome/heliport data

BCAR 4 13.6.1 This chart shall show:

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 4 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 4 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 4 13.6.1(g))

h) where established, hot spot locations with additional information properly annotated;
(See IEM BCAR 4 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;

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 4 13.6.2 In addition to the items in BCAR 4 13.6.1 relating to heliports, the chart shall show:

a) heliport type;
(See IEM BCAR 4 13.6.2)

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

CHAPTER 14 - AERODROME GROUND MOVEMENT CHART

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SUBPART O

CHAPTER 15 - AIRCRAFT PARKING/DOCKING CHART

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SUBPART P

CHAPTER 16 - WORLD AERONAUTICAL CHART 1:1 000 000

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SUBPART Q

CHAPTER 17 - AERONAUTICAL CHART — 1:500 000

BCAR 4 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 4 17.1)

BCAR 4 17.2 Availability

The Aeronautical Chart — 1:500 000 should be made available in the manner prescribed in BCAR 4 1.3.2 for all areas delineated in ICAO Annex 4 Appendix 5.

BCAR 4 17.3 Scales

BCAR 4 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 4 17.3.1.1 The length of the linear scale should be not less than 200 mm (8 in).

BCAR 4 17.3.2 A conversion scale (metres/feet) shall be shown in the margin.

BCAR 4 17.4 Format

BCAR 4 17.4.1 The title and marginal notes shall be in one of the working languages of ICAO.
(See IEM BCAR 4 17.4.1)

BCAR 4 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 4 17.4.3 The method of folding should 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 4 17.4.4 Whenever practicable, sheets should be quarter sheets of the World Aeronautical Chart — ICAO 1:1 000 000(is covered by chapter 16 of ICAO Annex 4). An appropriate index to adjacent sheets, showing the relationship between the two chart series, should be included on the face of the chart or on the reverse side.
(See IEM BCAR 4 17.4.4)

BCAR 4 17.4.5 Overlaps should be provided by extending the chart area on the top and right side beyond the area given on the index. This overlap area should contain all aeronautical, topographical, hydrographical and cultural information. The overlap should extend up to 15 km (8 NM), if possible, but in any case from the limiting parallels and meridians of each chart to the neat line.

BCAR 4 17.5 Projection

BCAR 4 17.5.1 A conformal (orthomorphic) projection shall be used.

BCAR 4 17.5.2 The projection of the World Aeronautical Chart — ICAO 1:1 000 000 (is covered by chapter 16 of ICAO Annex 4) should be used.

BCAR 4 17.5.3 Parallels shall be shown at intervals of 30′.

BCAR 4 17.5.3.1 Meridians shall normally be shown at intervals of 30′.
(See IEM BCAR 4 17.5.3.1)

BCAR 4 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 4 17.5.4.1 The length of the graduation marks should be approximately 1.3 mm (0.05 in) for the 1′ ntervals, 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 4 17.5.5 All meridians and parallels shown shall be numbered in the borders of the chart.

BCAR 4 17.5.5.1 Each meridian and parallel should be numbered within the body of the chart whenever this data is required operationally.

BCAR 4 17.5.6 The name and basic parameters of the projection shall be indicated in the margin.

BCAR 4 17.6 Identification

BCAR 4 17.6.1 Each sheet shall be identified by a name which should be that of the principal town or of a main geographical feature appearing on the sheet.

BCAR 4 17.6.1.1 Where applicable, sheets should 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 4 17.7 Culture and topography

BCAR 4 17.7.1 Built-up areas

BCAR 4 17.7.1.1 Cities, towns and villages shall be selected and shown according to their relative importance to visual air navigation.

BCAR 4 17.7.1.2 Cities and towns of sufficient size should be indicated by the outline of their built-up areas and not of their established city limits.

BCAR 4 17.7.2 Railroads

BCAR 4 17.7.2.1 All railroads having landmark value shall be shown.

— In congested areas, some railroads may be omitted in the interest of legibility.
— Railroads may be named.
— Rail stations may be shown.

BCAR 4 17.7.2.2 Tunnels shall be shown when they serve as prominent landmarks.
A descriptive note may be added, if necessary, to accentuate this feature.

BCAR 4 17.7.3 Highways and roads

BCAR 4 17.7.3.1 Road systems shall be shown in sufficient detail to indicate significant patterns from the air.
Roads under construction may be shown.

BCAR 4 17.7.3.2 Roads should not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.
The numbers or names of important highways may be shown.

BCAR 4 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, should be shown.
Descriptive notes may be added.

BCAR 4 17.7.5 Political boundaries

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

BCAR 4 17.7.6 Hydrography

BCAR 4 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), salt lakes, glaciers and ice caps shall be shown.

BCAR 4 17.7.6.2 The tint covering large open water areas should be kept very light.
A narrow band of darker tone may be used along the shore line to emphasize this feature.

BCAR 4 17.7.6.3 Reefs and shoals, including rocky ledges, tidal flats, isolated rocks, sand,

gravel, stone and all similar areas, should be shown by symbols when of significant landmark value.
Groups of rocks may be shown by a few representative rock symbols within the area.

BCAR 4 17.7.7 Contours

BCAR 4 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 4 17.7.7.2 The values of the contours used shall be shown.

BCAR 4 17.7.8 Hypsometric tints

BCAR 4 17.7.8.1 When hypsometric tints are used, the range of elevations for the tints shall be shown.

BCAR 4 17.7.8.2 The scale of the hypsometric tints used on the chart shall be shown in the margin.

BCAR 4 17.7.9 Spot elevations

BCAR 4 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 4 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 4 17.7.9.3 The spot elevation of the highest point on any sheet should be cleared of hypsometric tinting.

BCAR 4 17.7.10 Incomplete or unreliable relief

BCAR 4 17.7.10.1 Areas that have not been surveyed for contour information shall be labelled "Relief data incomplete".

BCAR 4 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 should be used with caution."

BCAR 4 17.7.11 Escarpments

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

BCAR 4 17.7.12 Wooded areas

BCAR 4 17.7.12.1 Wooded areas should be shown.

On high latitude charts, the approximate extreme northern or southern limits of tree growth may be shown.
BCAR 4 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 4 17.7.13 Date of topographic information

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

BCAR 4 17.8 Magnetic variation

BCAR 4 17.8.1 Isogonic lines shall be shown.

BCAR 4 17.8.2 The date of the isogonic information shall be indicated in the margin.

BCAR 4 17.9 Aeronautical data

BCAR 4 17.9.1 General

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

BCAR 4 17.9.2 Aerodromes

BCAR 4 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 4 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 4 17.9.2.3 Abandoned aerodromes which are still recognizable as aerodromes from the air shall be shown and identified as abandoned.

BCAR 4 17.9.3 Obstacles

BCAR 4 17.9.3.1 Obstacles shall be shown.

Shall be shown objects of a height of 100 m (300 ft) or more above ground are normally regarded as obstacles.

BCAR 4 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 4 17.9.4 Prohibited, restricted and danger areas

Prohibited, restricted and danger areas shall be shown.

BCAR 4 17.9.5 Air traffic services system

BCAR 4 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 4 17.9.5.2 Where appropriate, the air defence identification zone (ADIZ) shall be shown and properly identified. ADIZ procedures may be described in the chart legend.

BCAR 4 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 4 17.9.7 Supplementary information

BCAR 4 17.9.7.1 Aeronautical ground lights together with their characteristics or their identifications or both shall be shown.

BCAR 4 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

CHAPTER 18 - AERONAUTICAL NAVIGATION CHART SMALL SCALE

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SUBPART S

CHAPTER 19 - PLOTTING CHART

Reserved

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SUBPART T

CHAPTER 20 - ELECTRONIC AERONAUTICAL CHART DISPLAY

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SUBPART U

CHAPTER 21 - ATC SURVEILLANCE MINIMUM ALTITUDE CHART

BCAR 4 21.1 Function

BCAR 4 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 4 21.1.1)

BCAR 4 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 4 21.2 Availability

The ATC Surveillance Minimum Altitude Chart should be made available, in the manner prescribed in BCAR 4 1.3.2, where vectoring procedures are established and minimum vectoring altitudes cannot be shown adequately on the Area Chart, Standard Departure Chart — Instrument (SID) or Standard Arrival Chart — Instrument (STAR).

BCAR 4 21.3 Coverage and scale

BCAR 4 21.3.1 The coverage of the chart shall be sufficient to effectively show the information associated with vectoring procedures.

BCAR 4 21.3.2 The chart shall be drawn to scale.

BCAR 4 21.3.3 The chart should be drawn to the same scale as the associated Area Chart.

BCAR 4 21.4 Projection

BCAR 4 21.4.1 A conformal projection on which a straight line approximates a geodesic line should be used.

BCAR 4 21.4.2 Graduation marks should be placed at consistent intervals along the neat lines, as appropriate.

BCAR 4 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 4 21.5)

BCAR 4 21.6 Culture and topography

BCAR 4 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 4 21.6.2 Appropriate spot elevations and obstacles shall be shown.

Appropriate spot elevations and obstacles are those provided by the procedures specialist.

BCAR 4 21.7 Magnetic variation

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

BCAR 4 21.8 Bearings, tracks and radials

BCAR 4 21.8.1 Bearings, tracks and radials shall be magnetic, except as provided for in 21.8.2.

BCAR 4 21.8.2 In areas of high latitude, where it is determined by the appropriate authority that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, should be used.

BCAR 4 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 4 21.9 Aeronautical data

BCAR 4 21.9.1 Aerodromes

BCAR 4 21.9.1.1 All aerodromes that affect the terminal routings shall be shown. Where appropriate, a runway pattern symbol shall be used.

BCAR 4 21.9.1.2 The elevation of the primary aerodrome to the nearest metre or foot shall be shown.

BCAR 4 21.9.2 Prohibited, restricted and danger areas

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

BCAR 4 21.9.3 Air traffic services system

BCAR 4 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 4 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 4 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 4 21.9.3.2 A textual description of relevant communication failure procedures should be provided and should, whenever feasible, be shown on the chart or on the same page that contains the chart.

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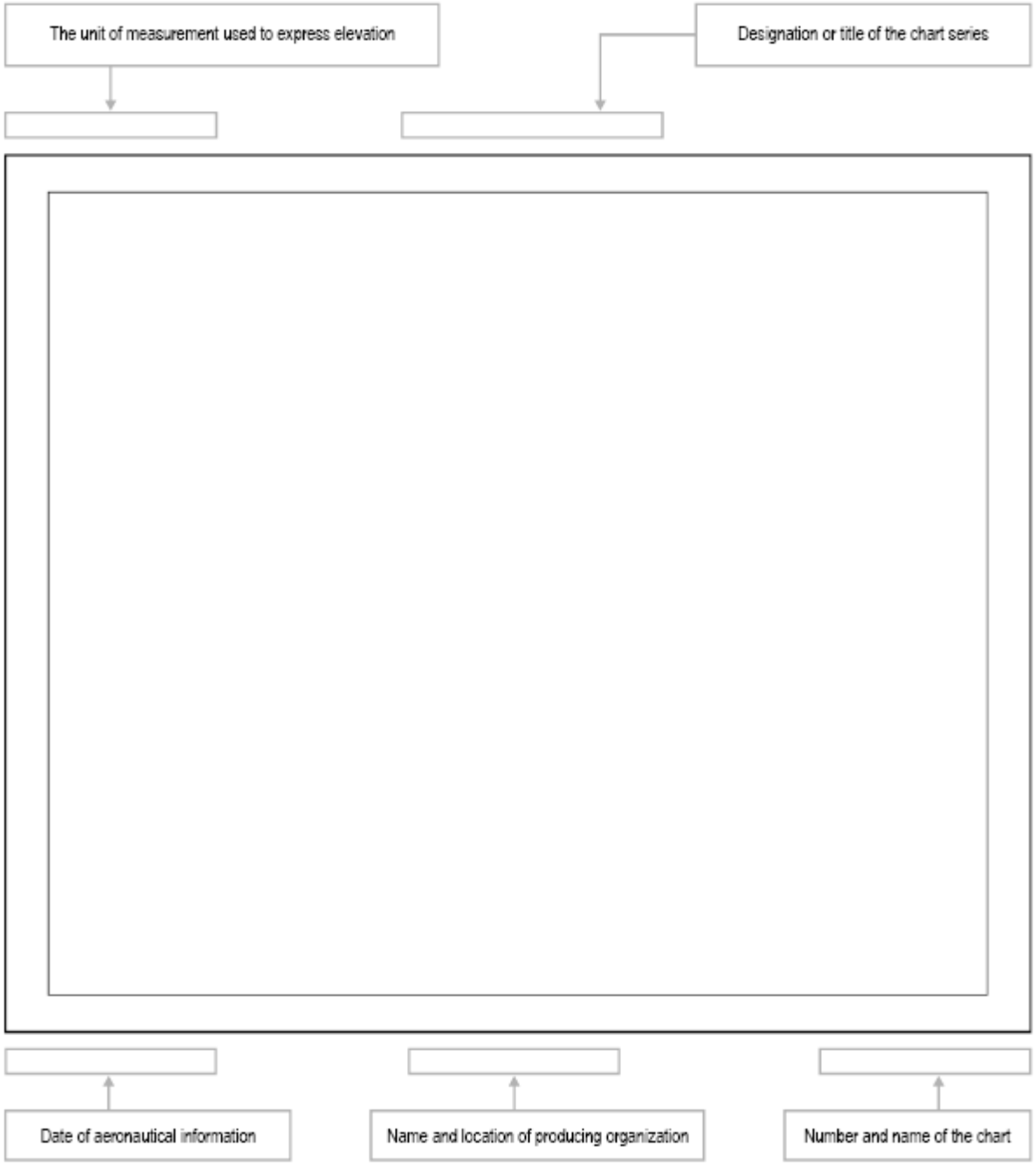
APPENDIX 1 - MARGINAL NOTE LAYOUT



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APPENDIX 2 - CHART SYMBOLS

1. CATEGORY INDEX

	Symbol No.
Shoals	41
Shore line (reliable)	19
Shore line (unreliable)	20
Small river (perennial)	24
Spring, well or water hole	37
Swamp	35
Tidal flats	21
Unusual water features appropriately labelled	46
Wash	40
CULTURE (47–83)	
Built-up Areas (47–50)	
Buildings	50
City or large town	47
Town	48
Village	49
Railroads (51–56)	
Railroad (single track)	51
Railroad (two or more tracks)	52
Railroad (under construction)	53
Railroad bridge	54
Railroad station	56
Railroad tunnel	55
Highways and Roads (57–62)	
Dual highway	57
Primary road	58
Road bridge	61
Road tunnel	62
Secondary road	59
Trail	60
Miscellaneous (63–83)	
Boundaries (international)	63
Church	80
Coast guard station	73
Dam	67
Fence	65
Ferry	68
Forest ranger station	76
Fort	79
Lookout tower	74
Mine	75
Mosque	81
Nuclear power station	72
Oil or gas field	70
Outer boundaries	64
Pagoda	82

2. ALPHABETICAL INDEX

Symbol No.

P

R

	Symbol No.
W	
Wash	40
Water	
Civil	85
Military	87
Joint civil and military	89
Water features appropriately labelled, unusual	46
Water hole (perennial or intermittent)	37
Waypoint — WPT	121
Well (perennial or intermittent)	37
Wind turbine, unlighted and lighted	140
Wind turbines, minor group and group in major area, lighted	141

TOPOGRAPHY

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 eskar	Alternative
10	Unusual land features appropriately labelled	Many Small Volcanoes; Rock Outcrop
	Active volcano	
11	Mountain pass	5395
12	Highest elevation on chart	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)	
24	Small river (perennial)	
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	

RAILROADS

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

HIGHWAYS AND ROADS

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

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	

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	

AERODROMES

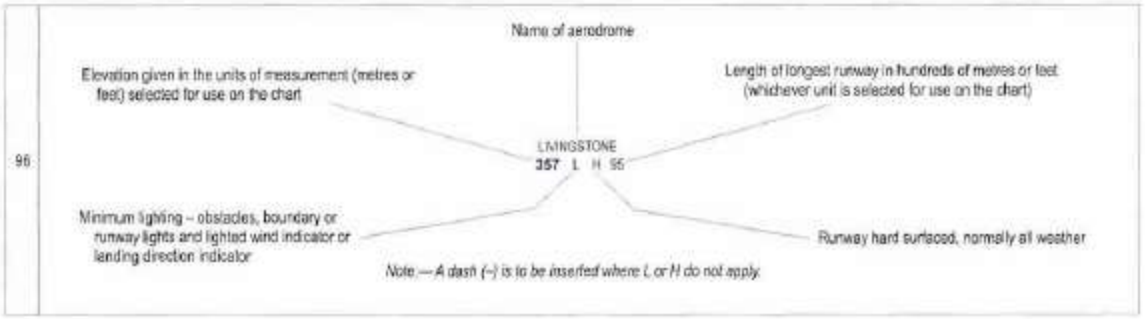
84	Civil	Land	
85	Civil	Water	
86	Military	Land	
87	Military	Water	
88	Joint civil and military	Land	
89	Joint civil and military	Water	
90	Emergency aerodrome or aerodrome with no facilities		
91	Abandoned or closed aerodrome		
92	Sheltered anchorage		
93	Aerodrome for use on charts on which aerodrome classification is not required e.g. Enroute Charts		
94	Heliport *Note.— Aerodrome for the exclusive use of helicopters*		

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 17.9.2.2)



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

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

VOR	
VOR/DME	
TACAN	
VORTAC	

- guidance matenal on the presentation of radio navigation aid data is given in theICAO 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	(R)
		compulsory, without radio communication requirement	(R)
		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.

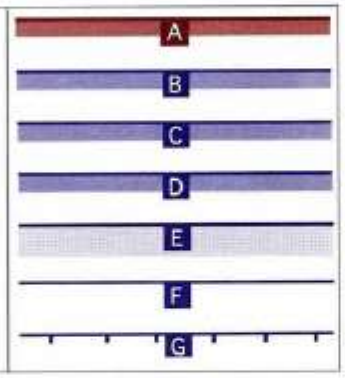
122	Change-over point COP To be superimposed on the appropriate route symbol at right angles to the route		26 36	123	ATS/MET reporting point MRP	Compulsory On request		124	Final approach fix FAF

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

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	
131	Lighted obstacle	
132	Group obstacles	
133	Lighted group obstacles	

134	Exceptionally high obstacle (optional symbol)	
135	Exceptionally high obstacle — lighted (optional symbol) *Note.— For obstacles having a height of the order of 300 m (1 000 ft) above terrain.*	

136 Elevation of top (italics) — 52 / (15) — Height above specified datum (upright type in parentheses)

MISCELLANEOUS

137	Prominent transmission line		140	Wind turbine — unlighted and lighted	
138	Isogonic line or isogonal	3° E	141	Wind turbines — minor group and group in major area, lighted	
139	Ocean station vessel (normal position)				

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

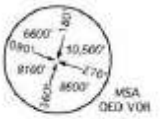
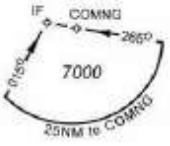
145	Hard surface runway		154	Point light	● / O
146	Pierced steel plank or steel mesh runway		155	Obstacle light	
147	Unpaved runway		156	Landing direction indicator (lighted)	
148	Stopway SWY		157	Landing direction indicator (unlighted)	T
149	Taxiways and parking areas		158	Stop bar	•••
150	Helicopter alighting area on an aerodrome	Ⓗ	159	Runway-holding position Pattern A Pattern B *Note.— For application, see Annex 14, Volume I, 5.2.10*	
151	Aerodrome reference point ARP		160	Intermediate holding position *Note.— For application, see Annex 14, Volume I, 5.2.11.*	
152	VOR check-point		161	Hot spot *Note.— Hot spot location to be circled.*	
153	Runway visual range (RVR) observation site				

SYMBOLS FOR AERODROME OBSTACLE CHARTS - TYPE A, B AND C

		Plan	Profile
162	Tree or shrub		Identification number
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)	

APPENDIX 3 - COLOUR GUIDE
(Ref. BCAR 4 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.)*

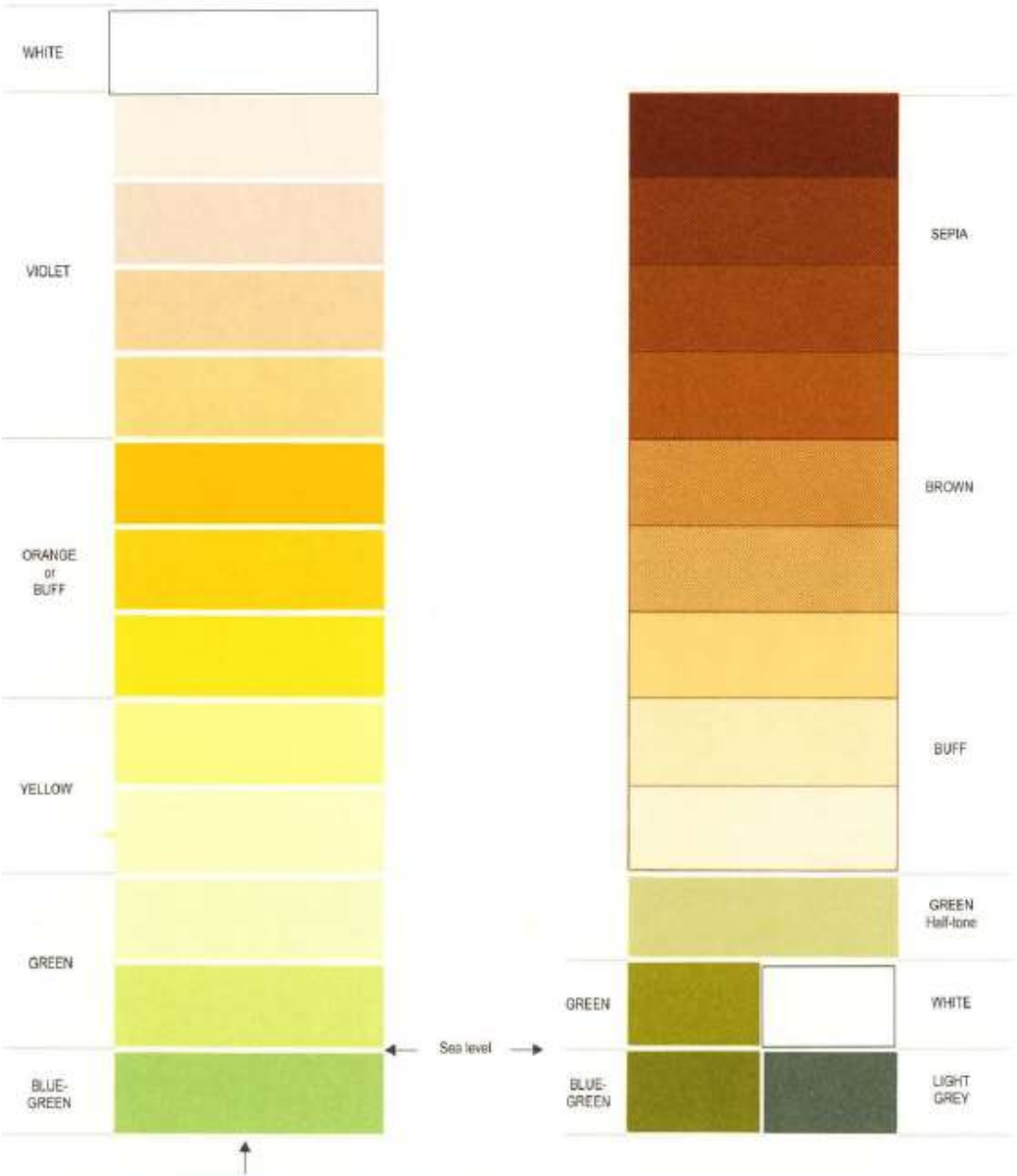
Woods		GREEN	
Areas which have not been surveyed for contour information or relief data are incomplete	Optional colours	GOLDEN BUFF	
		WHITE	

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.

APPENDIX 4 - HYPSOMETRIC TINT GUIDE
(Alternative systems, reference BCAR 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 - RESERVED

Reserved

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APPENDIX 6 - AERONAUTICAL DATA QUALITY REQUIREMENTS

Table 1. Latitude and longitude

Latitude and longitude	Chart resolution	Integrity / Classification
Flight information region boundary points	as plotted	1×10^{-3} / routine
P, R, D area boundary points (outside CTA/CTR boundaries)	as plotted	1×10^{-3} / routine
P, R, D area boundary points (inside CTA/CTR boundaries)	as plotted	1×10^{-5} / essential
CTA/ CTR boundary points	as plotted	1×10^{-5} / essential
En-route navaids, intersections and waypoints, and holding, and STAR/SID points	1 sec	1×10^{-5} / essential
Obstacles in Area 1 (the entire State territory)	as plotted	1×10^{-3} / routine
Aerodrome/heliport reference point	1 sec	1×10^{-3} / routine
Navaids located at the aerodrome/heliport	as plotted	1×10^{-5} / essential
Obstacles in Area 3	1/10 sec	1×10^{-5} / essential
Obstacles in Area 2	1/10 sec	1×10^{-5} / essential
Final approach fixes/points and other essential fixes/points comprising the instrument approach procedure	1 sec	1×10^{-5} / essential
Runway thresholds	1 sec	1×10^{-8} / critical
Taxiway centre line/parking guidance line points	1/100 sec	1×10^{-5} / essential
Runway end	1 sec	1×10^{-8} / critical
Runway holding position	1 sec	1×10^{-8} / critical
Taxiway intersection marking line	1 sec	1×10^{-5} / essential
Exit guidance line	1 sec	1×10^{-5} / essential
Apron boundaries (polygon)	1 sec	1×10^{-3} / routine
De-/anti-icing facility (polygon)	1 sec	1×10^{-3} / routine
Aircraft standpoints/INS checkpoints	1/100 sec	1×10^{-3} / routine
Geometric centre of TLOF or FATO thresholds, heliports	1 sec	1×10^{-8} / critical

See BCAR 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Table 2. Elevation/altitude/height

Elevation/altitude/height	Chart resolution	Integrity / Classification
Aerodrome/heliport elevation	1 m or 1 ft	1×10^{-5} / essential
WGS-84 geoid undulation at aerodrome/heliport elevation position	1 m or 1 ft	1×10^{-5} / essential
Runway or FATO threshold, non-precision approaches	1 m or 1 ft	1×10^{-5} / essential
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, non-precision approaches	1 m or 1 ft	1×10^{-5} / essential
Runway or FATO threshold, precision approaches	0.5 m or 1 ft	1×10^{-8} / critical
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, precision approaches	0.5 m or 1 ft	1×10^{-8} / critical
Threshold crossing height, precision approaches	0.5 m or 1 ft	1×10^{-8} / critical
Obstacle clearance altitude/height (OCA/H)	as specified in PANS-OPS (Doc 8168)	1×10^{-5} / essential
Obstacles in Area 1 (the entire State territory)	3 m (10 ft)	1×10^{-3} / routine
Obstacles in Area 2	1 m or 1 ft	1×10^{-5} / essential
Obstacles in Area 3	1 m or 1 ft	1×10^{-5} / essential
Distance measuring equipment (DME)	30 m (100 ft)	1×10^{-5} / essential
Instrument approach procedures altitude	as specified in PANS-OPS (Doc 8168)	1×10^{-5} / essential
Minimum altitudes	50 m or 100 ft	1×10^{-3} / routine

See BCAR 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Table 3. Gradients and angles

Type of gradient/angle	Chart resolution	Integrity / Classification
Non-precision final approach descent gradient	0.1 per cent	1×10^{-3} / critical
Final approach descent angle (Non-precision approach or approach with vertical guidance)	0.1 degree	1×10^{-3} / critical
Precision approach glide path/elevation angle	0.1 degree	1×10^{-3} / critical

Table 4. Magnetic variation

Magnetic variation	Chart resolution	Integrity / Classification
Aerodrome/heliport magnetic variation	1 degree	1×10^{-5} / essential

Table 5. Bearing

Bearing	Chart resolution	Integrity / Classification
Airway segments	1 degree	1×10^{-3} / routine
En-route and terminal fix formations	1/10 degree	1×10^{-3} / routine
Terminal arrival/departure route segments	1 degree	1×10^{-3} / routine
Instrument approach procedure fix formations	1/10 degree	1×10^{-5} / essential
ILS localizer alignment	1 degree	1×10^{-5} / essential
MLS zero azimuth alignment	1 degree	1×10^{-5} / essential
Runway and FATO bearing	1 degree	1×10^{-3} / routine

Table 6. Length/distance/dimension

Length/distance/dimension	Chart resolution	Integrity / Classification
Airway segment length	1 km or 1 NM	1×10^{-3} / routine
En-route fix formation distance	2/10 km (1/10 NM)	1×10^{-3} / routine
Terminal arrival/departure route segment length	1 km or 1 NM	1×10^{-5} / essential
Terminal and instrument approach procedure fix formation distance	2/10 km (1/10 NM)	1×10^{-5} / essential
Runway and FATO length, TLOF dimensions	1 m	1×10^{-8} / critical
Runway width	1 m	1×10^{-5} / essential
Stopway length and width	1 m	1×10^{-8} / critical
Landing distance available	1 m	1×10^{-8} / critical
Take-off run available	1 m	1×10^{-8} / critical
Take-off distance available	1 m	1×10^{-8} / critical
Accelerate-stop distance available	1 m	1×10^{-8} / critical
ILS localizer antenna-runway end, distance	as plotted	1×10^{-3} / routine
ILS glide slope antenna-threshold, distance along centre line	as plotted	1×10^{-3} / routine
ILS marker-threshold distance	2/10 km (1/10 NM)	1×10^{-5} / essential
ILS DME antenna-threshold, distance along centre line	as plotted	$1y10^{-5}$ / essential
MLS azimuth antenna-runway end, distance	as plotted	1×10^{-3} / routine
MLS elevation antenna-threshold, distance along centre line	as plotted	1×10^{-3} / routine
MLS DME/P antenna-threshold, distance along centre line	as plotted	1×10^{-5} / essential

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SECTION 2
IEM

SECTION 2 - ADVISORY CIRCULARS

1. GENERAL

1.1. If a specific parragraph does not have an IEM, it means that the parragraph does not need one.

2. PRESENTATION

2.1. The sequence after the abreviation IEM indicates the parragraph number of the refering BCAR-4.

2.2. The abreviations are defined as follows:

Interpretative and Explanatory Material (IEM) shows the ways or alternatives, but not necessarily the only posible way to comply with a specific paragraph of the BCAR-4.

SUBPART A

CHAPTER 1 - DEFINITIONS, APPLICABILITY AND AVAILABILITY

Area navigation (RNAV):

Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.

ATS route:

The term ATS route is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.

An ATS route is defined by route specifications that include an ATS route designator, the track to or fromsignificant points (waypoints), distance between significant points, reporting requirements and, as determined by the appropriate ATS authority, the lowest safe altitude.

ATS surveillance system:

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

Calendar:

*ISO 19108, Geographic information — Temporal schema

Change-over point:
Change-over points are established to provide the optimum balance in respect of signal strength and quality between facilities at all levels to be used and to ensure a common source of azimuth guidance for all aircraft operating along the same portion of a route segment.

Data product specification:

* ISO 19131, Geographic information — Data product specifications

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

Data set:

*ISO 19101, Geographic information — Reference model

Data set series:

*ISO 19115, Geographic information — Metadata

Datum:

*ISO 19104, Geographic information — Terminology

Digital Elevation Model (DEM):

Digital Terrain Model (DTM) is sometimes referred to as DEM.

Feature:

*ISO 19101, Geographic information — Reference model

Feature atribute :

*ISO 19101, Geographic information — Reference model

A feature attribute has a name, a data type and a value domain associated with it.

Flight level:

A pressure type altimeter calibrated in accordance with the Standard Atmosphere:

a) when set to a QNH altimeter setting, will indicate altitude;

b) when set to a QFE altimeter setting, will indicate height above the QFE reference datum;

c) when set to a pressure of 1 013.2 hPa, may be used to indicate flight levels.

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

Geoid:

The geoid is irregular in shape because of local gravitational disturbances (wind tides, salinity, current, etc.) and the direction of gravity is perpendicular to the geoid at every point.

Geoid undulation:

In respect to the World Geodetic System — 1984 (WGS-84) defined ellipsoid, the difference between the WGS-84 ellipsoidal height and orthometric height represents WGS-84 geoid undulation.

Gregorian calendar:

*ISO 19108, Geographic information — Temporal schema

In the Gregorian calendar, common years have 365 days and leap years 366 days divided into twelve sequential months.

Magnetic variation:

The value given indicates whether the angular difference is East or West of True North.

Metadata:

* ISO 19115 Geographic information — Metadata

Data that describes and documents data.

Navigation specification:

The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.

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

Obstacle:

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

Obstacle Clearance altitude (OCA) or Obstacle Clearance height (OCH):

Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.

For convenience when both expressions are used they may be written in the form “obstacle clearance altitude/height” and abbreviated “OCA/H”.

See ICAO Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Volume I, Part I, Section 4, Chapter 1, 1.5, and Volume II, Part I, Section 4, Chapter 5, 5.4, for specific applications of this definition.

Performance-based navigation (PBN):

Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.

Portrayal:

* ISO 19117. Geographic information — Portrayal

Procedure turn:

Procedure turns are designated “left” or “right” according to the direction of the initial turn.

Procedure turns may be designated as being made either in level flight or while descending, according to thecircumstances of each individual procedure

Reporting point:

There are three categories of reporting points: ground-based navigation aid, intersection and waypoint. In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground-based navigation aids. A reporting point can be indicated as “on request” or as “compulsory”.

Runway-holding position:

In radiotelephony phraseologies, the expression “holding point” is used to designate the runway-holding position.

Significant point:

There are three categories of significant points: ground-based navigation aid, intersection and waypoint. In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground-basednavigation aids.

Terrain:

In practical terms, depending on the method of data collection, terrain represents the continuous surface that exists at the bare Earth, the top of the canopy or something in-between, also known as “first reflective surface”

IEM BCAR 4 1.2.1 Applicability
(See BCAR 4 1.2.1)

Chapter 2, 2.4.4, and Chapter 5 are applicable on and after 18 November 2010.

IEM BCAR 4 1.3.2 Charts
(See BCAR 4 1.3.2)

The availability of charts includes specified electronic charts.

IEM BCAR 4 1.3.3 Guarantee and quality of charts
(See BCAR 4 1.3.3)

Guidance material on the preparation of aeronautical charts, including sample formats, is contained in the Aeronautical Chart Manual (Doc 8697).

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SUBPART B

CHAPTER 2 - GENERAL SPECIFICATIONS

IEM CHAPTER 2 General specification
(See CHAPTER 2)

The Standards and Recommended Practices contained in this chapter are applicable to all ICAO aeronautical charts unless otherwise stated in the specifications of the chart concerned.

IEM BCAR 4 2.1.1 Human Factors principles
(See BCAR 4 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 4 2.3.2 The marginal note
(See BCAR 4 2.3.2(a))
The title may be abbreviated.

IEM BCAR 4 2.4 Symbols
(See BCAR 4 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 4 2.10.2 Political boundaries
(See BCAR 4 2.10.2)

In the case of a dependent territory, the name of the sovereign may be added in brackets.

IEM BCAR 4 2.12.1 Relief
(See BCAR 4 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 4 2.13 Prohibited, restricted and danger areas
(See BCAR 4 2.13)

Nationality letters are those contained in Doc 7910 — Location Indicators.

IEM BCAR 4 2.15.2 Magnetic variation
(See BCAR 4 2.15.2)
The date and the annual change may be shown.

IEM BCAR 4 2.17.1 Magnetic variation
(See BCAR 4 2.17.1)

Specifications governing the quality system are given in BCAR 15, Chapter 3.

IEM BCAR 4 2.17.5 AERONAUTICAL DATA
(See BCAR 4 2.17.5)

Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity, protection and

traceability) is contained in the World Geodetic System — 1984 (WGS-84) Manual (Doc 9674). Supporting material in respect of the provisions of Appendix 6 related to chart resolution and integrity of aeronautical data is contained in RTCA Document DO-201A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-77 — Industry Requirements for Aeronautical Information.

IEM BCAR 4 2.18.1.1 Horizontal reference system
(See BCAR 4 2.18.1.1)

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

IEM BCAR 4 2.18.1.3 Horizontal reference system
(See BCAR 4 2.18.1.3)

Specifications governing the determination and reporting (accuracy of field work and data integrity) of WGS-84-related aeronautical coordinates for geographical positions established by air traffic services are given in BCAR ATS, Chapter 2, and Appendix 4, Table 1; and for aerodrome/heliport-related positions, in BCAR 14, Volumes I and II, Chapter 2, and in Table A5-1 of Appendix 5 and Table A1-1 of Appendix 1, respectively.

IEM BCAR 4 2.18.2.1 Vertical reference system
(See BCAR 4 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 4 2.18.2.2 Vertical reference system
(See BCAR 4 2.18.2.2)

Specifications governing 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, Volumes I and II, Chapter 2, and in Table A5-2 of Appendix 5 and Table A1-2 of Appendix 1, respectively.

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SUBPART C

CHAPTER 3 - AERODROME OBSTACLE CHART - TYPE A (OPERATING LIMITATIONS)

IEM BCAR 4 3.4.1 Coverage and scale
(See BCAR 4 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 4 3.4.3 Coverage and scale
(See BCAR 4 3.4.3)

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

IEM BCAR 4 3.8.2.2 Take-off flight path area
(See BCAR 4 3.8.2.2)

When a 1.0 per cent survey plane touches no obstacles, this plane may be lowered until it touches the first obstacle.

IEM BCAR 4 3.8.3.1 Take-off flight path area
(See BCAR 4 3.8.3.1)

In BCAR 14, Volume I, Attachment A, Section 3, guidance is given on declared distances.

IEM BCAR 4 3.8.4.1) the plan view shall show
(See BCAR 4 3.8.4.1)

This does not exclude the necessity for indicating critical spot elevations within the take-off flight path area.

IEM BCAR 4 3.8.4.2) The profile view
(See BCAR 4 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

CHAPTER 4 - AERODROME OBSTACLE CHART — TYPE B

IEM BCAR 4 4.4.1) Coverage and scale
(See BCAR 4 4.4.4.21)

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 4 4.5) Coverage and scale
(See BCAR 4 4.5(e))

Lines of latitude and longitude may be shown across the face of the chart.

IEM BCAR 4 4.7) Culture and topography
(See BCAR 4 4.7)

Geographical names of features may be shown if of significance.

IEM BCAR 4 4.9.1 Aeronautical data
(See BCAR 4 4.4.9.1(l))

The take-off area is described in BCAR 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, Volume I, Chapter 4.

IEM BCAR 4 4.9.1 Aeronautical data
(See BCAR 4 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 4 4.9.1 Aeronautical data
(See BCAR 4 4.9.1(n))

The specifications in BCAR 14, Volume I, Chapter 4, are minimum requirements. Where the competent authority has established lower surfaces, they may be used in the determination of obstacles.

SUBPART E

CHAPTER 5 - AERODROME TERRAIN AND OBSTACLE CHART — (ELECTRONIC)

Reserved

SUBPART F

CHAPTER 6 - PRECISION APPROACH TERRAIN CHART — ICAO

Reserved

SUBPART G

CHAPTER 7 - ENROUTE CHART

IEM BCAR 4 7.1 Function
(See BCAR 4 7.1)
Simplified versions of these charts are appropriate for inclusion in Aeronautical Information Publications to complement the tabulation of communication and navigation facilities.

IEM BCAR 4 7.2.1 Availability
(See BCAR 4 7.2.1)

Under certain conditions, an Area Chart may have to be provided. (See Chapter 8.)

IEM BCAR 4 7.3 Coverage and scale
(See BCAR 4 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 4 7.9.1 Aerodromes
(See BCAR 4 9.1)

Other aerodromes may be shown.

IEM BCAR 4 7.9.3.1.1(h) Air traffic services system
(See BCAR 4 7.9.3.1.1(h))

Overall distances between radio navigation aids may also be shown.

IEM BCAR 4 7.9.3.1.1(i) Air traffic services system
(See BCAR 4 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 4 7.9.3.1.1(l) Air traffic services system
(See BCAR 4 7.9.3.1.1(l))

ADIZ procedures may be described in the chart legend

.

SUBPART H

CHAPTER 8 - AREA CHART

IEM BCAR 4 8.1(c) Function
(See BCAR 4 8.1.(c))

The function described in BCAR 4 8.1 c) may be satisfied by a separate chart or an inset on an Enroute Chart.

IEM BCAR 4 8.5 Identification
(See BCAR 4 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 should be added.

IEM BCAR 4 8.6.2 Culture and topography
(See BCAR 4 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 Appendix 3 — Colour Guide for contours and topographic features.

Appropriate spot elevations and obstacles are those provided by the procedures specialist.

IEM BCAR 4 8.9.3 Area minimum altitudes
(See BCAR 4 8.9.3)

Depending on the selected chart scale, quadrilaterals formed by the parallels and meridians normally correspond to the whole degree of latitude and longitude.

IEM BCAR 4 8.9.4(j) Air traffic services system
(See BCAR 4 8.9.4(j))

Overall distances between radio navigation aids may also be shown.

IEM BCAR 4 8.9.4(k) Air traffic services system
(See BCAR 4 8.9.4(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 4 8.9.4(m) Air traffic services system
(See BCAR 4 8.9.4(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 unless excessive

chart clutter will result.

Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart may be provided (see Chapter 21), in which case the elements indicated by BCAR 4 8.9.4.1.1, l), need not be duplicated on the Area Chart.

SUBPART I

CHAPTER 9 - STANDARD DEPARTURE CHART INSTRUMENT (SID)

IEM BCAR 4 9.1 Function

(See BCAR 4 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 4 9.3.1 Coverage and scale

(See BCAR 4 9.3.1)

The departure route normally originates at the end of a runway.

IEM BCAR 4 9.5 Identification

(See BCAR 4 9.5)

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

IEM BCAR 4 9.6.2 Culture and topography

(See BCAR 4 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 Appendix 3 — Colour Guide for contours and topographic features.

Appropriate spot elevations and obstacles are those provided by the procedures specialist.

IEM BCAR 4 9.8.1 Bearings, tracks and radials

(See BCAR 4 9.8.1)

A note to this effect may be included on the chart.

IEM BCAR 4 9.9.3.2 Minimum sector altitude

(See BCAR 4 9.9.3.2)

Depending on the selected chart scale, quadrilaterals formed by the parallels and meridians normally correspond to the half-degree of latitude and longitude.

IEM BCAR 4 9.9.4.1.1(a)(6) Minimum sector altitude

(See BCAR 4 9.9.4.1.1(a)(6))

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) — unless excessive chart clutter will result.

Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — may be provided (see Chapter 21), in which case the elements indicated by BCAR 9.9.4.1.1, a) 6), need not be duplicated on the Standard Departure Chart — Instrument (SID) — .

IEM BCAR 4 9.9.4.1.1(f) Minimum sector altitude
(See BCAR 4 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 4 9.9.4.3 Aeronautical database requirements
(See BCAR 4 9.9.4.3)

Appropriate data are those provided by the procedures specialist

.

SUBPART J

CHAPTER 10 - STANDARD ARRIVAL CHART —INSTRUMENT (STAR) —

IEM BCAR 4 10.1 Function

(See BCAR 4 10.1)

Standard arrival routes — instrument are to be interpreted as including “standard descent profiles”, “continuous descent approach”, and other non-standard descriptions. In the case of a standard descent profile, the depiction of a cross-section is not required.

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 4 10.6.2 Culture and topography

(See BCAR 4 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 Appendix 3 —Colour Guide for contours and topographic features.

Appropriate spot elevations and obstacles are those provided by the procedures specialist.

IEM BCAR 4 10.8.1 Bearings, tracks and radials

(See BCAR 4 10.8.1)

A note to this effect may be included on the chart.

IEM BCAR 4 10.9.3.2 Minimum sector altitude

(See BCAR 4 10.9.3.2)

Depending on the selected chart scale, quadrilaterals formed by the parallels and meridians normally correspond to the half-degree of latitude and longitude.

IEM BCAR 4 10.9.4.1.1 Air traffic services system

(See BCAR 4 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) — unless excessive chart clutter will result.

Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — may be provided (see Chapter 21), in which case the elements indicated by BCAR 10.9.4.1.1, a) 6), need not be duplicated on the Standard Arrival Chart — Instrument (STAR) .

IEM BCAR 4 10.9.4.3 Aeronautical database requirements
(See BCAR 4 10.9.4.3)

Appropriate data are those provided by the procedures specialist.

SUBPART K

CHAPTER11 - INSTRUMENT APPROACH CHART

IEM BCAR 4 11.1 Function
(See BCAR 4 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 4 11.2.3 Availability
(See BCAR 4 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 4 11.2.4 Availability
(See BCAR 4 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 4 11.7.2 Culture and topography
(See BCAR 4 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 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 Culture and topography
(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 4 11.9.1 Bearings, tracks and radials
(See BCAR 4 11.9.1)

A note to this effect may be included on the chart.

IEM BCAR 4 11.10.2.1 Obstacles
(See BCAR 4 11.10.2.1)

Appropriate obstacles are those provided by the procedures specialist.

IEM BCAR 4 11.10.6.5 Portrayal of procedure tracks
(See BCAR 4 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 4 11.10.9 Aeronautical database requirements
(See BCAR 4 11.10.9)

Appropriate data are those provided by the procedures specialist.

SUBPART L

CHAPTER12 - VISUAL APPROACH CHART

IEM BCAR 4 12.3.2 Scale
(See BCAR 4 12.3.2)

A scale of 1:250 000 or 1:200 000 is preferred.

IEM BCAR 4 12.4 Format
(See BCAR 4 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 4 12.7.4 Culture and topography
(See BCAR 4 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

CHAPTER13 - AERODROME/HELIPORT CHART

IEM BCAR 4 13.2.2 Availability
(See BCAR 4 13.2.2)

Under certain conditions, an Aerodrome Ground Movement Chart and an Aircraft Parking/Docking Chart may have to be provided (see Chapters 14 and 15); in which case, the elements portrayed on these supplementary charts need not be duplicated on the Aerodrome/Heliport Chart.

IEM BCAR 4 13.6.1(d) Aerodrome/heliport data
(See BCAR 4 13.6.1(d))

Bearing strengths may be shown in tabular form on the face or verso of the chart.

IEM BCAR 4 13.6.1(e)Aerodrome/heliport data
(See BCAR 4 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 4 13.6.1(g) Aerodrome/heliport data
(See BCAR 4 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 4 13.6.1(h) Aerodrome/heliport data
(See BCAR 4 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 4 13.6.2) Aerodrome/heliport data
(See BCAR 4 13.6.2)

Heliport types are identified in ICAO Annex 14, Volume II, as surface-level, elevated or helideck.

SUBPART N

CHAPTER 14 - AERODROME GROUND MOVEMENT CHART

Reserved

SUBPART O

CHAPTER 15 - AIRCRAFT PARKING/DOCKING CHART

Reserved

SUBPART P

CHAPTER 16 - WORLD AERONAUTICAL CHART 1:1 000 000

Reserved

SUBPART Q

CHAPTER 17- AERONAUTICAL CHART — 1:500 000

IEM BCAR 4 17.1) Function
(See BCAR 4 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 produce charts of this series covering their national territories, the entire area being portrayed is usually treated on a regional basis.

IEM BCAR 4 17.2) Availability
(See BCAR 4 17.2)

The selection of this scale as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000 is covered by chapter 16 of ICAO Annex 4 (16.2.1 and 16.2.2).

IEM BCAR 4 17.4.1) Format
(See BCAR 4 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 4 17.4.4) Format
(See BCAR 4 17.4.4)

Sheet lines may be varied to satisfy particular requirements.

IEM BCAR 4 17.5.3.1) Projection
(See BCAR 4 17.5.3.1)

At high latitudes, this interval may be increased.

SUBPART R

CHAPTER 18 - AERONAUTICAL NAVIGATION CHART SMALL SCALE

Reserved

SUBPART S

CHAPTER 19 - PLOTTING CHART

Reserved

SUBPART T

CHAPTER 20 - ELECTRONIC AERONAUTICAL CHART DISPLAY

Reserved

SUBPART U

CHAPTER 21 - ATC SURVEILLANCE MINIMUM ALTITUDE CHART

IEM BCAR 4 21.1.1) Projection
(See BCAR 4 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 4 21.5) Identification
(See BCAR 4 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 4 21.9.3.1(c)) Identification
(See BCAR 4 21.9.3.1(c))

Routes used in the vectoring of aircraft to and from the significant points may be shown.

IEM BCAR 4 21.9.3.1(e)(2)) Identification
(See BCAR 4 21.9.3.1(e)(2))

In congested areas, geographical coordinates may be omitted in the interest of legibility.