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REQUIREMENTS FOR AERONAUTICAL CHARTS (AAR-ACh)

“State Civil Aviation Agency”
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Baku

AZƏRBAYCAN RESPUBLİKASI
RƏQƏMSAL İNKİŞAF VƏ NƏQLİYYAT NAZİRLİYİ
DÖVLƏT MÜLKİ AVİASİYA AGENTLİYİ
PUBLİK HÜQUQİ ŞƏXS

ƏMR

“Aeronaviqasiya xəritələrinə dair tələblər” sənədinin 3-cü nəşrinə 1-ci dəyişikliyin təsdiq edilməsi haqqında

Beynəlxalq Mülki Aviasiya Təşkilatının (ICAO) 4 nömrəli Əlavəsinə (Annex 4 – “Aeronautical Charts”) edilmiş 62-ci və 63-cü düzəlişlərdən irəli gələn tələblərin nəzərə alınması və milli mülki aviasiya qanunvericiliyinin həmin dəyişikliklərə uyğunlaşdırılmasının təmin edilməsi məqsədilə, Azərbaycan Respublikası Prezidentinin 2025-ci il 21 fevral tarixli 341 nömrəli Fərmanı ilə təsdiq edilmiş “Dövlət Mülki Aviasiya Agentliyi” publik hüquqi şəxsin Nizamnaməsinin 2.1.3, 2.1.5, 3.1.6-cı və 4.10.6-cı yarımbəndlərini rəhbər tutaraq,

əmr edirəm:

1. “Aeronaviqasiya xəritələrinə dair tələblər” (“Requirements for Aeronautical Charts”) adlı sənədin 3-cü nəşrinə 1-ci dəyişiklik (bundan sonra – Tələblər) təsdiq edilsin.
2. Keyfiyyətə nəzarət sektoru bu Əmrlə birlikdə Tələblərin “Dövlət Mülki Aviasiya Agentliyi” publik hüquqi şəxsinin (bundan sonra – Agentlik) bütün şəxsi heyətinə çatdırılmasını təmin etsin.
3. İnzibati idarəetmə departamenti bu Əmr və onunla təsdiq edilmiş Tələblərin Agentliyin rəsmi internet informasiya ehtiyatında yerləşdirilməsini təmin etsin.
4. Aeronaviqasiya standartlarına və hava hərəkətinin idarə edilməsinə nəzarət (ANS) departamenti bu Əmrlə birlikdə Tələblərin aidiyyəti mülki aviasiya subyektlərinə müşayiət məktubu ilə çatdırılmasını təmin etsin.
5. Tələblərin “Azərbaycan Hava Yolları” QSC-nin “Azəraeronaviqasiya” Hava Hərəkəti İdarəsi tərəfindən tətbiqi üçün bu Əmrin qüvvəyə mindiyi tarixdən etibarən 1 (bir) aylıq keçid müddəti müəyyən edilsin.
6. Əmrin icrasına nəzarət Aeronaviqasiya standartlarına və hava hərəkətinin idarə edilməsinə nəzarət (ANS) departamenti müdirinin müavini Leyla Həsənovaya həvalə edilsin.

İdarə Heyəti sədrinin müavini,
İdarə Heyətinin sədri vəzifəsini
müvəqqəti icra edən **Bəhruz Məlikov**

Qurumun adı: Dövlət Mülki Aviasiya Agentliyi
Sənədin elektron imzalanma tarixi: 16.11.2026
Sənədin qeydiyyat nömrəsi: 3-27-102/3-2-70/2026/1
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Qeyd: 'Elektron imza və elektron sənəd haqqında' Azərbaycan Respublikası Qanununun 3-cü maddəsinə əsasən elektron imza əl imzası ilə bərabər hüquqi qüvvəyə malikdir.Elektron imza şəxsin kağız daşıyıcı üzərindəki möhürlə təsdiq edilmiş əl imzasına bərabər tutulur.

0. Administration and control of the document

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Date:	18.10.2026

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Date:	20.10.2026

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0.4. Distribution and control

Copy #	Type of Copy	Structural division	Location
Master	**(S)**	Quality control sector	SCAA Library/ Intranet
1	**(S)**	Quality control sector	Digital Control System

(S) Soft Copy – (electronic version)
(H) Hard Copy – (printed version)

Note: *Electronic and hard copies are considered "uncontrolled" if they are printed or not included into this distribution list.*

0.5. Records of amendments and revisions

Edition/Revision number	Effective date	Reason	Order
Edition № 02	12.MAY.2020		12.MAY.2020
Ed.02 Rev.01	09.APRIL.2021		09.APRIL.2021
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Ed.03 Rev.01	16.NOVEMBER.2026	ICAO AMDT 62 and 63 to Annex 4	3-27-102/3-2-70/2026

Edition: - *Release of a document having incorporated all previous revisions until the current version. New edition of a document will not show revised text in blue colour. Current edition of a document shown on each page in footer.*

Revision: *- A change made to a part of document, where it is reflected with blue text or accompanied with a vertical line on right side of a document. Basic information on revisions (number and date) given in the List of effective Pages and indicated in header of affected page and in context itself.*

0.6. Terms and definitions

When the following terms are used in the AAR-ACh for aeronautical charts, 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 . 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.

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.

Note 1: *The term ATS route is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.*

Note 2: *An ATS route is defined by route specifications that include an ATS route designator, the track to or from significant points (waypoints), distance between significant points, reporting requirements and, as determined by the appropriate ATS authority, the lowest safe altitude.*

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

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

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).

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.

Note: *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.*

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.

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 check (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*).

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

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 (or equivalent assurance level), traceability,timeliness, completeness and format.

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

Data set. Identifiable collection of data (ISO 19101*).

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

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

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

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

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*).

Feature attribute. Characteristic of a feature (ISO 19101*).

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

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.

Note 1: *A pressure type altimeter calibrated in accordance with the Standard Atmosphere:*

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

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

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

Note 2: *The terms "height" and "altitude", used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.*

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.

Note: *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. The distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid.

Note: *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.*

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*).

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

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.

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

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.

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

(a) routine data: 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;

(b) essential data: 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) critical data: 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.

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.

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

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*).

Note*: Data that describes and documents data.*

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

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.

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

Note 1*: The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.*

Note 2: *The term RNP, previously defined as "a statement of the navigation performance necessary for operation within a defined airspace", has been removed from this AAR-ACh as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this AAR-ACh 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 Doc 9613.*

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.

Note: *The term obstacle is used in this R-ACh 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). 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.

Note 1: *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.*

Note 2: *For convenience when both expressions are used they may be written in the form "obstacle clearance altitude/height" and abbreviated "OCA/H".*

Note 3: *See 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, and Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Part I, Section 4, Chapter 5, 5.4, for specific applications of this definition.*

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.

Note*: Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, and functionality needed for the proposed operation in the context of a particular airspace concept. Availability of a global navigation satellite system signal in space and/or some other navigation aid infrastructure is considered within the airspace concept in order to enable the navigation application.*

Point light. A luminous signal appearing without perceptible length.

Portrayal. Presentation of information to humans (ISO 19117*).

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 published altitude/height used in defining the vertical profile of a flight procedure, at or above the minimum obstacle clearance altitude/height where established.

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.

Note 1: *Procedure turns are designated "left" or "right" according to the direction of the initial turn.*

Note 2: *Procedure turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.*

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.

Note: *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".*

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.

Note*: In radiotelephony phraseologies, the expression "holding point" is used to designate the runway-holding position.*

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.

Note: *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-based navigation aids.*

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.

Note*: 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".*

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.

0.7. Abbreviations

ADA	Advisory Airspace
ADIZ	Air Defence Identification Zone
ADR	Advisory Route
ADS-B	Automatic Dependent Surveillance — Broadcast
AIM	Aeronautical Information Management
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
AIS	Aeronautical Information Services
AMA	Area Minimum Altitude
ANS	Air Navigation Services
ARP	Aerodrome Reference Point
ATC	Air Traffic Control
ATS	Air Traffic Services
ATS/MET	Air Traffic Services / Meteorological
ATZ	Aerodrome Traffic Zone
AWY	Airway
COP	Change-over Point
CRC	Cyclic Redundancy Check
CTA	Control Area
CTR	Control Zone
CWY	Clearway
DA/H	Decision Altitude/Height
DEM	Digital Elevation Model
DME	Distance Measuring Equipment
DTM	Digital Terrain Model
FAF	Final Approach Fix
FAP	Final Approach Point
FATO	Final Approach and Take-off Area
FIR	Flight Information Region
HRP	Heliport Reference Point
IAF	Initial Approach Fix
IF	Intermediate Approach Fix
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IMW	International Map of the World
ISO	International Organization for Standardization
MDA/H	Minimum Descent Altitude/Height
MEA	Minimum En-route Altitude
MOCA	Minimum Obstacle Clearance Altitude
MRP	ATS/MET Reporting Point
MSA	Minimum Sector Altitude
MSL	Mean Sea Level
NDB	Non-directional Radio Beacon
OCA	Obstacle Clearance Altitude
OCH	Obstacle Clearance Height
OCA/H	Obstacle Clearance Altitude/Height
OFZ	Obstacle Free Zone
OIS	Obstacle Identification Surface
PAR	Precision Approach Radar
PBN	Performance-based Navigation

PSR	Primary Surveillance Radar
QFE	Atmospheric pressure at aerodrome elevation (or runway threshold)
QNH	Altimeter setting to obtain elevation when on the ground
RNAV	Area Navigation
RNP	Required Navigation Performance
RVR	Runway Visual Range
SATVOICE	Satellite Voice Communications
SCAA	State Civil Aviation Agency
SID	Standard Instrument Departure
SSR	Secondary Surveillance Radar
STAR	Standard Instrument Arrival
SWY	Stopway
TAA	Terminal Arrival Altitude
TACAN	UHF Tactical Air Navigation Aid
TLOF	Touchdown and Lift-off Area
UHF	Ultra High Frequency
UTC	Coordinated Universal Time
VFR	Visual Flight Rules
VHF	Very High Frequency
VOR	VHF Omnidirectional Radio Range
VOR/DME	Collocated VOR and DME
VORTAC	Collocated VOR and TACAN
WGS-84	World Geodetic System — 1984
WPT	Waypoint

0.8. Terms shall, should, may

The following terms shall have the meaning outlined below:

“Shall” - An action verb in the imperative sense means that the application of a rule or procedure or provision is mandatory.

“Should” - Means that the application of a procedure or provision is recommended.

“May” - Means that the application of a procedure or provision is optional.

0.9. Administration and control

The PDF files will be locked and signed to prevent changes.

This document is regularly revised and amended. All personnel must be familiarized with all revisions done.

This document will be Amended and Revised in accordance with requirements of “Documentation and Control” procedure.

0.10. Foreword

0.10.1. These Requirements for Aeronautical Charts (hereinafter – AAR-ACh) are based on the standards and recommended practices stipulated in Annex 4 (entitled “Aeronautical Charts”) to the Chicago Convention on International Civil Aviation (as in force and amended from time to time by the Council of the International Civil Aviation Organization), and with such adaptations, as may be determined by the State Civil Aviation Agency (SCAA) to be applicable in Azerbaijan.

0.10.2. These AAR-ACh contains:

(a) All applicable in Civil Aviation charts.

(b) Aeronautical charts standards, recommended practices and guidance materials pertaining to the preparing charts.

0.10.3. From time to time, the SCAA will supplement the aeronautical Charts standards and requirements stipulated in AAR-ACh. Where appropriate, such directives will be incorporated into this AAR-ACh by amendment.

0.10.4. Amendments to this AAR-ACh are the responsibility of the SCAA Chairman of the Board (Note: In the event of the temporary absence of the Chairman of the Board, his/her powers shall be exercised by a person from among the Deputy Chairman of the Board.

0.10.5. Readers shall forward advice of errors, inconsistencies or suggestions for improvement to the Oversight Air Navigation Standards and Air Traffic Management (ANS) Department at the address below:

State Civil Aviation Agency of the Republic of Azerbaijan

AZ1095, Azerbaijan, Baku, Azadliq ave.11.

0.11. Applicability

0.11.1. Aeronautical Charts for Azerbaijan Republic are produced by Air Navigation Service provider.

0.11.2. This document contains the specifications for seventeen types of aeronautical charts for which an international need for uniformity has been established. Of these charts the production/availability of six types of charts is mandatory, six non-mandatory and for four types of charts the production is “conditional”.

0.12. Availability

0.12.1. *Information.* Service provider shall on request by another State provide all information relating to its own territory that is necessary to enable the Standards of this document to be met.

0.12.2. *Charts.* Service provider shall, when so specified, ensure the availability of charts or single sheet of a chart series.

***Note**: The availability of charts includes specified electronic charts.*

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

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

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

1. General specifications

The requirements contained in this chapter are applicable to all aeronautical charts in this document unless otherwise stated in the specifications of the chart concerned.

1.1. Operational requirements for charts

For the purposes of AAR-ACh, 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.

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

Note: *Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (Doc 9683).*

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

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

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

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

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

1.1.7. The basic sheet size of the charts shall be 210 x 148 mm (8.27 x 5.82 in) (A5), or 297 x 210 mm (11.7 x 8.3 in) (A4) or 297 x 420 mm (11.7 x 16.5 in) (A3).

1.2. Titles

The title of a chart or chart series prepared in accordance with the specifications contained in this AAR-ACh 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 1 and any specified for the particular chart.

1.3. Miscellaneous Information

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

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

(a) designation or title of the chart series;

***Note**: The title may be abbreviated*.

(b) name and reference of the sheet;

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

1.3.3. 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.

1.3.4. 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.

1.4. Symbols

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

***Note**: 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.*

1.4.2. 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.

1.4.3. 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.

1.4.4. Service provider shall ensure that symbols are shown in the manner specified in 1.4.2, 1.4.3 and Appendix 2 — ICAO Chart Symbols, symbol number 121.

1.5. Units of Measurement

1.5.1. Distances shall be derived as geodesic distances.

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

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

1.5.4. Linear dimensions on aerodromes and short distances shall be expressed in metres.

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

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

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

1.6. Scale and Projection

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

1.6.2. For charts of small areas, a linear scale only shall be indicated.

1.7. Date of Validity of Aeronautical Information

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

1.8. Spelling of Geographical Names

1.8.1. The symbols of the Roman alphabet shall be used for all writing.

1.8.2. The names of places and of geographical features in countries which officially use varieties of the Roman alphabet shall be accepted in their official spelling, including the accents and diacritical marks used in the respective alphabets.

1.8.3. 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.

1.8.4. In areas where romanized names have not been officially produced or adopted, and outside the territory of Azerbaijan Republic, names shall be transliterated from the non-Roman alphabet form by the system generally used by the producing agency.

1.9. Abbreviations

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

1.9.2. Where applicable, abbreviations shall be selected from the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (Doc 8400).

1.10. Political Boundaries

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

1.10.2. Where the territory of more than one State appears on a chart, the names identifying the countries shall be indicated.

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

1.11. Colours

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

1.12. Relief

1.12.1. 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.

***Note**: 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.*

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

1.12.3. Where spot elevations are used, they shall be shown for selected critical points.

1.12.3.1. The value of spot elevations of doubtful accuracy shall be followed by the sign ±.

1.13. 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.

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

1.14. Air traffic Services Airspaces

1.14.1. 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 — ICAO Chart Symbols.

1.14.2. On charts used for visual flight, those parts of the ATS Airspace Classes table (Appendix 4) in AAR-ATS rules applicable to the airspace depicted on the chart shall be on the face or reverse of each chart.

1.15. Magnetic Variation

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

1.15.2. When magnetic variation is shown on a chart, the values shown shall be those for the year nearest to the date of publication that is divisible by 5, i.e. 2010, 2015, etc. In exceptional cases where the current value would be more than one degree different, after applying the calculation for annual change, an interim date and value shall be quoted.

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

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

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

1.16. Typography

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

1.17. Aeronautical Data

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

Note*: Specifications governing the quality system are given in AAR - AIS, Chapter 3.*

1.17.2. Service provider shall ensure that the order of chart resolution of aeronautical data shall be that as specified for a particular chart

Note: *Specifications concerning the chart resolution for aeronautical data are contained in AIM Manual, Appendix 1.*

1.17.3. Service provider shall ensure that integrity of aeronautical data is maintained throughout the data process from origination to distribution to the next intended user.

Note: Specifications concerning the integrity classification related to aeronautical data are provided in AIM Manual, Appendix 1.

1.17.4. Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets.

Note: *Detailed specifications concerning digital data error detection techniques are contained in AIM Manual.*

1.18. Common Reference Systems

1.18.1. Horizontal reference system

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

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

1.18.1.2. Geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in *AAR – ATS Chapter 2*, and AAR – AS Chapter 6, shall be identified by an asterisk.

1.18.1.3. The chart resolution of geographical coordinates shall be that specified for a particular chart series.

Note 1: *Specifications concerning he 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 AAR – ATS* Chapter 2*; and for aerodrome/heliport-related positions, in AAR – AS Chapter 6, .*

Note 2: *Specifications concerning the accuracy and integrity classification of WGS-84-related aeronautical data are contained in AIM Manual, Appendix 1.*

1.18.2. Vertical reference system

1.18.2.1. 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.

Note 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.*

Note 2*: Gravity-related heights (elevations) are also referred to as orthometric heights while distances of points above the ellipsoid are referred to as ellipsoidal heights.*

1.18.2.2. 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.

Note 1: *Specifications concerning the determination and reporting (accuracy of field work and data integrity) of elevation and geoid undulation at specific positions at aerodromes/heliports are given in AAR – AS Chapter 6.*

Note 2.: *Specifications concerning the accuracy and integrity classification of elevation and geoid undulation at specific positions at aerodromes/heliports are contained in AIM Manual, Appendix 1.*

1.18.2.3. The chart resolution of elevation and geoid undulation shall be that specified for a particular chart series.

Note: *Specifications concerning the chart resolution of elevation and geoid undulation are contained in AIM Manual, Appendix 1.*

1.18.3. Temporal reference system

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

1.18.3.2. 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).

2. AERODROME OBSTACLE CHART – ICAO TYPE A (OPERATING LIMITATIONS)

2.1. 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 AAR – OPS 1 and ICAO Doc 8168 (PANS – OPS vol. II).

2.2. Availability

2.2.1. Aerodrome Obstacle Charts — ICAO Type A (Operating Limitations) shall be made available in the manner prescribed in 0.12.2 for all aerodromes regularly used by international civil aviation, except for those aerodromes where there are no obstacles in the take-off flight path areas or where the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) is provided in accordance with Chapter 5.

2.2.2. 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.

2.3. Units of Measurement

2.3.1. Elevations shall be shown to the nearest half-metre or to the nearest foot.

2.3.2. Linear dimensions shall be shown to the nearest half-metre.

2.4. Coverage and Scale

2.4.1. The extent of each plan shall be sufficient to cover all obstacles.

***Note**: 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.*

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

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

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

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

2.5. Format

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

2.5.2. 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.

2.5.3. 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.

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

2.5.4. The chart shall include:

(a) a box for recording the operational data specified in 2.8.3.;

(b) a box for recording amendments and dates thereof.

2.6. Identification

2.6.1. 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).

2.7. Magnetic Variation

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

2.8. Aeronautical Data

2.8.1. **Obstacles**

2.8.1.1. 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 2.8.1.2 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.

2.8.1.2. 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 2.8.1.1. 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.

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

2.8.2. **Take-off flight path area**

2.8.2.1. 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.

2.8.2.2. 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 2.8.2.1 c). shall be increased to not less than 12.0 km (6.5 NM) and the slope of the plane surface specified in 2.8.1.1 and 2.8.1.2 shall be reduced to 1.0 per cent or less.

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

2.8.3. Declared distances

2.8.3.1. The following information for each direction of each runway shall be entered in the space provided:

(a) take-off run available;

(b) accelerate-stop distance available;

(c) take-off distance available;

(d) landing distance available.

***Note:** In AAR – AS Chapter 6, para 6.2.8 requirement is given on declared distances.*

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

2.8.4. Plan and profile views

2.8.4.1. 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.

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

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

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

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

2.8.4.2. 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.

***Note:** An obstacle profile consisting of a line joining the tops of each obstacle and representing the shadow created by successive obstacles may be shown.*

2.9. Accuracy

2.9.1. The order of accuracy attained shall be shown on the chart.

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

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

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

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

2.9.4. *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.

3. AERODROME OBSTACLE CHART – ICAO TYPE B

3.1. 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.

3.2. Availability

3.2.1. Aerodrome Obstacle Charts — ICAO Type B should be made available, in the manner prescribed in 1.12.2 for all aerodromes regularly used by international civil aviation except for those aerodromes where the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) is provided in accordance with Chapter 5.

3.2.2. When a chart combining the specifications of Chapters 2 and 3 is made available, it shall be called the Aerodrome Obstacle Chart — ICAO (Comprehensive).

3.3. Units of Measurement

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

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

3.4. Coverage and Scale

3.4.1. The extent of each plan shall be sufficient to cover all obstacles.

***Note**: 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.*

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

3.4.3. 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.

3.5. Format

The charts shall include:

(a) any necessary explanation of the projection used;

(b) any necessary identification of the grid used;

(c) a notation indicating that obstacles are those which penetrate the surfaces specified in AAR – AS Chapter 10;

(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.

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

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, and the name of the aerodrome.

3.7. Culture and Topography

3.7.1. Drainage and hydrographic details shall be kept to a minimum.

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

3.7.3. All objects, either cultural or natural, that project above the take-off and approach surfaces specified in 3.9 or the clearing and marking surfaces specified AAR – AS Chapter 10, shall be shown.

3.7.4. 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.

***Note:** Geographical names of features may be shown if of significance.*

3.8. 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.

3.9. Aeronautical Data

3.9.1. 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;

***Note**: The take-off area is described in 2.8.2.1. The approach area consists of an area on the surface of the earth lying directly below the approach surface as specified in AAR – AS Chapter 10.*

(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;

***Note:** This does not exclude the necessity for indicating critical spot elevations within the take-off and approach areas.*

(n) any additional obstacles, as determined by 2.8.1.1 including the obstacles in the shadow of an obstacle, which would otherwise be exempted.

***Note:** The specifications in AAR – AS Chapter 10, are minimum requirements. Where the competent authority has established lower surfaces, they may be used in the determination of obstacles.*

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

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

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

3.10. Accuracy

3.10.1. The order of accuracy attained shall be shown on the chart.

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

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

(a) Take-off and approach areas:

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

(b) Other areas:

1. horizontal distances: 5 m (15 ft) within 5 000 m (15 000 ft) of the aerodrome reference point and 12 m (40 ft) beyond that area;
2. vertical distances: 1 m (3 ft) within 1 500 m (5 000 ft) of the aerodrome reference point increasing at a rate of 1 per 1 000.

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

4. AERODROME TERRAIN AND OBSTACLE CHART – ICAO (ELECTRONIC)

4.1. Function

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

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

(b) support the following air navigation applications:

1. instrument procedure design (including circling procedure);
2. aerodrome obstacle restriction and removal; and
3. provision of source data for the production of other aeronautical charts.

4.2. Availability

4.2.1. Aerodrome Terrain and Obstacle Charts — ICAO (Electronic) shall be made available in the manner prescribed in 0.12.2, for aerodromes regularly used by international civil aviation.

Note 1: *Where the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) is made available, the Aerodrome Obstacle Chart — ICAO Type A (Operating Limitations) and the Aerodrome Obstacle Chart — ICAO Type B are not required (see 2.2.1 and 3.2.1).*

Note 2: *The information required by the Precision Approach Terrain Chart — ICAO may be provided in the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic). Where this occurs, the Precision Approach Terrain Chart — ICAO is not required (see 5.2.1).*

4.2.2. Aerodrome Terrain and Obstacle Charts — ICAO (Electronic) shall be made available in the manner prescribed in 0.12.2 for all aerodromes regularly used by international civil aviation.

4.2.3. The Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) shall also be made available in hard copy format upon request.

Note: *For specifications regarding hard copy printed output, see 4.7.7 .*

4.2.4. The ISO 19100 series of standards for geographic information shall be used as a general data modeling framework.

Note: *The use of the ISO 19100 series of standards for geographic information supports the interchange and use of the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) among different users.*

4.3. Identification

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

4.4. Chart Coverage

The extent of each chart shall be sufficient to cover Area 2 as specified in AAR - AIS, Chapter 5.

4.5. Chart Content

4.5.1. General

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

***Note**: ISO Standard 19117 contains a definition of the schema describing the portrayal mechanism of feature-based geographic information, while ISO Standard 19109 contains rules for application schema. Spatial geometry and associated topological relationships are defined in ISO Standard 19107.*

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

4.5.2. Terrain feature

4.5.2.1. The terrain feature, and associated attributes, to be portrayed and database-linked to the chart shall be based on the terrain data sets which satisfy the requirements of AAR - AIS, Chapter 5.

***Note:** Specifications concerning terrain data sets are contained in AIM Manual, Chapter 5 and Appendices 1, 6 and 8*

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

***Note:** In accordance with AAR - AIS, Chapter 5 and AIM Manual, Chapter 5 and Appendices 1 and 8, the DEM for Area 2 post spacing (grid) is specified at 1 arc second (approximately 30 m).*

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

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

4.5.2.5. The portrayed terrain feature shall be linked to the following associated attributes in the database(s):

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

(b) surface type;

(c) contour line values, if provided; and

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

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

Note: *Specifications concerning terrain attributes are contained in AIM Manual, Appendix 6, Table A6-1.*

4.5.3. Obstacle features

4.5.3.1. Obstacle features, and associated attributes, portrayed or database-linked to the chart shall be based on obstacle data sets which satisfy the requirements of AAR - AIS, Chapter 5

Note: *Specifications concerning obstacle data sets are contained in AIM Manual, Chapter 5 and Appendices 1, 6 and 8.*

4.5.3.2. Each obstacle shall be portrayed by an appropriate symbol and obstacle identifier.

4.5.3.3. The portrayed obstacle feature shall be linked to the following associated attributes in the database(s):

(a) horizontal position in geographic coordinates and associated elevation;

(b) obstacle type; and

(c) obstacle extent, if appropriate.

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

Note: *Specifications concerning obstacle attributes are contained in AIM Manual, Appendix 6, Table A6-2.*

4.5.4. Aerodrome features

4.5.4.1. Aerodrome features, and associated attributes, portrayed and database-linked to the chart shall be based on aerodrome data which satisfy the requirements of AAR - AIS, Chapter 5.

Note: *Specifications concerning aerodrome features and associated attributes are contained in AIM Manual, Chapter 5 and Appendix 1.*

4.5.4.2. The following aerodrome features shall be portrayed by an appropriate symbol:

(a) aerodrome reference point;

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

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

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

(a) geographical coordinates of the aerodrome reference point;

(b) aerodrome magnetic variation, year of information and annual change;

***Note**: Magnetic variation may be database-linked to the aerodrome reference point.*

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

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

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

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

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

4.5.5. **Radio navigation aid features**

Each radio navigation aid feature located within the chart coverage shall be portrayed by an appropriate symbol.

***Note**: Navigation aid feature attributes may be linked to the portrayed navigation aid features in the database(s).*

4.6. Accuracy and Resolution

4.6.1. The order of accuracy of aeronautical terrain and obstacle data shall be in accordance with its intended use.

***Note:** Specifications concerning the accuracy of aeronautical, terrain and obstacle data are contained in the AIM Manual Appendix 1.*

4.6.2. The aeronautical terrain and obstacle data resolution shall be commensurate with the actual data

Note: *Specifications concerning the order of resolution for aeronautical, terrain and obstacle data are provided in the AIM Manual, Appendix 1.*

4.7. Electronic Functionality

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

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

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

4.7.4. The chart shall include its own “reader” software.

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

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

***Note**: An electronic chart format with user-selectable information layers is the preferred method of presentation for most aerodrome features.*

4.7.7. It shall be possible to print the chart in hard copy format according to the content specifications and scale determined by the user.

***Note 1:** Printed output may consist of “tiled” sheets or specific selected areas according to user requirements.*

***Note 2:** Feature attribute information available through database link may be supplied separately on appropriately referenced sheets.*

4.8. Chart Data Product Specifications

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

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

***Note:** ISO Standard 19131 specifies the requirements and outline of data product specifications for geographic information.*

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

4.8.4. The data content of the chart data product specifications shall clearly identify the type of coverage and/or imagery and shall provide a narrative description of each.

***Note:** ISO Standard 19123 contains schema for coverage geometry and functions.*

4.8.5. The chart data product specifications shall include information that defines the reference systems used. This shall include the spatial reference system (horizontal and

vertical) and, if appropriate, temporal reference system. The chart data product specifications shall identify the data quality requirements. This shall include a statement on acceptable conformance quality levels and corresponding data quality measures. This statement shall cover all the data quality elements and data quality sub-elements, even if only to state that a specific data quality element or sub-element is not applicable.

Note: *ISO Standard 19113 contains quality principles for geographic information while ISO Standard 19114 covers quality evaluation procedures.*

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

4.8.7. The chart data product specifications shall contain information on how data are portrayed on the chart, as detailed in 4.5.1.1. The chart data product specifications shall also contain data product delivery information which shall include delivery formats and delivery medium information.

4.8.8. The core chart metadata elements shall be included in the chart data product specifications. Any additional metadata items required to be supplied shall be stated in the product specifications together with the format and encoding of the metadata.

Note 1*: ISO Standard 19115 specifies requirements for geographic information metadata.*

Note 2*: The chart data product specifications document the chart data product which is implemented as data set. Those data sets are described by metadata.*

5. PRECISION APPROACH TERRAIN CHART- ICAO

5.1. Function

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

5.2. Availability

5.2.1. The Precision Approach Terrain Chart — ICAO shall be made available in the manner prescribed in 0.12.2 for all precision approach runways Categories II and III at aerodromes used by international civil aviation, except where the requisite information is provided in the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) in accordance with Chapter 5.

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

5.3. Scale

5.3.1. The horizontal scale shall be 1:2 500, and the vertical scale 1:500.

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

5.4. Identification

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

5.5. Plan and Profile Information

5.5.1. The chart shall include:

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

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

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

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

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

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6. ENROUTE CHART – ICAO

6.1. Function

This chart shall provide flight crews with information to facilitate navigation along ATS routes in compliance with air traffic services procedures.

***Note**: Simplified versions of these charts are appropriate for inclusion in Aeronautical Information Publications to complement the tabulation of communication and navigation facilities.*

6.2. Availability

6.2.1. The Enroute Chart — ICAO shall be made available in the manner prescribed in 0.12.2 for all areas where flight information regions have been established.

***Note**: Under certain conditions, an Area Chart — ICAO may have to be provided (see Chapter 8.)*

6.2.2. 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.

6.3. Coverage and Scale

***Note 1:** A uniform scale for charts of this type cannot be specified due to the varying degree of congestion of information in certain areas.*

***Note 2:** A linear scale based on the mean scale of the chart may be shown.*

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

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

6.3.3. An adequate overlap of charts shall be provided to ensure continuity of navigation.

6.4. Projection

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

6.4.2. Parallels and meridians shall be shown at suitable intervals.

6.4.3. Graduation marks shall be placed at consistent intervals along selected parallels and meridians.

6.5. Identification

Each sheet shall be identified by chart series and number.

6.6. Culture and Topography

6.6.1. 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.

6.6.2. Within each quadrilateral formed by the parallels and meridians, the area minimum altitude shall be shown.

***Note 1**: Quadrilaterals formed by the parallels and meridians normally correspond to the whole degree of latitude and longitude. Regardless of the chart scale being used, the area minimum altitude relates to the consequent quadrilateral.*

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

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

6.7. Magnetic Variation

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

6.8. Bearings, Tracks and Radials

6.8.1. Bearings, tracks and radials shall be magnetic, except as provided for in 6.8.2. Where bearings and tracks are additionally provided as true values for PBN segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g. 290° (294.9°T).

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

6.9. Aeronautical Data

6.9.1. Aerodromes

All aerodromes used by international civil aviation to which an instrument approach can be made shall be shown.

***Note**: Other aerodromes may be shown.*

6.9.2. 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.

6.9.3. Air traffic services system

6.9.3.1. Where appropriate, the components of the established air traffic services system shall be shown.

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;

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

(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;

***Note**: Overall distances between radio navigation aids may also be shown.*

(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;

***Note**: 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.*

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

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

(l) air defence identification zone (ADIZ) properly identified.

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

6.9.4. Supplementary information

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

***Note 1**: For specifications of these charts, see Chapters 7, 8 and 9.*

***Note 2**: Departure routes normally originate at the end of a runway; arrival routes normally terminate at the point where an instrument approach is initiated.*

6.9.4.2. Where established, altimeter setting regions shall be shown and identified.

7. AREA CHART — ICAO

7.1. 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.

***Note**: The function described in 7.1 c) may be satisfied by a separate chart or an inset on an Enroute Chart — ICAO.*

7.2. Availability

7.2.1. The Area Chart — ICAO shall be made available in the manner prescribed in 0.12.2 where the air traffic services routes or position reporting requirements are complex and cannot be adequately shown on an Enroute Chart — ICAO.

7.2.2. 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.

***Note**: Under certain conditions, a Standard Departure Chart — Instrument (SID) — ICAO and a Standard Arrival Chart — Instrument (STAR) — ICAO may have to be provided (see Chapters 8 and 9).*

7.3. Coverage and Scale

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

7.3.2. The chart shall be drawn to scale and a scale-bar shown.

7.4. Projection

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

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

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

7.5. Identification

The chart shall be identified by a name associated with the airspace portrayed.

***Note**: The name may be that of the air traffic services centre, the name of the largest city or town situated in the area covered by the chart or the name of the city that the aerodrome serves. Where more than one aerodrome serves the city or town, the name of the aerodrome on which the procedures are based shall be added.*

7.6. Culture and Topography

7.6.1. 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.

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

***Note 1**: 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.*

***Note 2**: 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.*

***Note 3**: Appropriate spot elevations and obstacles are those provided by the procedures specialist.*

7.7. Magnetic Variation

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

7.8. Bearings, Tracks and Radials

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

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

7.9. Aeronautical Data

7.9.1. Aerodromes

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

7.9.2. Prohibited, restricted and danger areas

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

7.9.3. Area minimum altitudes

Area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians.

***Note 1:** Quadrilaterals formed by the parallels and meridians normally correspond to the whole degree of latitude and longitude. Regardless of the chart scale being used, the area minimum altitude relates to the consequent quadrilateral.*

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

7.9.4. Air traffic services system

7.9.4.1. The components of the established relevant air traffic services system shall be shown.

7.9.4.1.1 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;

Note*: Overall distances between radio navigation aids may also be shown.*

(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;

Note*: 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.*

(l) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 metres or 100 feet (see *AAR – ATS, 2.2*2);

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

***Note 1**: Where ATS surveillance systems are used to vector aircraft to or from significant points on a published standard departure or arrival route or to issue clearance for descent below the minimum sector altitude during arrival, the relevant procedures may be shown on the Area Chart — ICAO unless excessive chart clutter will result.*

***Note 2**: Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — ICAO may be provided (see Chapter 21), in which case the elements indicated by 7.9.4.1.1, l), need not be duplicated on the Area Chart — ICAO.*

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

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

(p) an indication of “flyover” significant points.

8. STANDARD INSTRUMENT DEPARTURE CHART — INSTRUMENT (SID) — ICAO

8.1. 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.

***Note 1**: Provisions governing the identification of standard departure routes are in AAR – ATS, Appendix 3; guidance material relating to the establishment of such routes is contained in the Air Traffic Services Planning Manual (Doc 9426).*

***Note 2**: Provisions governing obstacle clearance criteria and details of the minimum information to be published are contained in the Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Volume II, Part II.*

8.2. Availability

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

8.3. Coverage and Scale

8.3.1. 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.

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

8.3.2. The chart shall be drawn to scale.

8.3.3. If the chart is drawn to scale, a scale-bar shall be shown.

8.3.4. 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.

8.4. Projection

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

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

8.4.3. Graduation marks shall be placed at consistent intervals along the neat lines.

8.5. 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 (Doc 8168), Volume II, Part I, Section 3, Chapter 5.

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

8.6. Culture and Topography

8.6.1. 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.

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

***Note 1**: 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.*

***Note 2:** 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.*

***Note 3**: Appropriate spot elevations and obstacles are those provided by the procedures specialist.*

8.7. Magnetic Variation

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

8.8. Bearings, Tracks and Radials

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

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

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

8.9. Aeronautical Data

8.9.1. Aerodromes

8.9.1.1. The aerodrome of departure shall be shown by the runway pattern.

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

8.9.2. 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.

8.9.3. Minimum sector altitude

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

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

***Note 1**: Quadrilaterals formed by the parallels and meridians normally correspond to the half degree of latitude and longitude. Regardless of the chart scale being used, the area minimum altitude relates to the consequent quadrilateral.*

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

8.9.4. **Air traffic services system**

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

8.9.4.1.1 The components shall comprise the following:

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

1. for departure procedures designed specifically for helicopters, the term “CAT H” shall be depicted in the departure chart plan view;
2. route designator;
3. significant points defining the route;
4. track or radial to the nearest degree along each segment of the route;
5. distances to the nearest kilometre or nautical mile between significant points;
6. minimum obstacle clearance altitudes, along the route or route segments and altitudes required by the procedure to the nearest higher 50 m or 100 ft and flight level restrictions where established;
7. where the chart is drawn to scale and vectoring on departure is provided, established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;

***Note 1**: Where ATS surveillance systems are used to vector aircraft to or from significant points on a published standard departure route, the relevant procedures may be shown on the Standard Departure Chart — Instrument (SID) — ICAO unless excessive chart clutter will result.*

***Note 2**: Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — ICAO may be provided (see Chapter 20), in which case the elements indicated by 8.9.4.1.1 a) 6), need not be duplicated on the Standard Departure Chart — Instrument (SID) — ICAO.*

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

1. when the radio navigation aid is used for conventional navigation:
   i. plain language name;
   ii. identification;

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

2. when the radio navigation aid is used as a significant point for area navigation:
i. plain language name; and
ii. identification;

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

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

i. name-code;

ii. geographical coordinates in degrees, minutes and seconds;

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

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

v. identification of the reference radio navigation aid;

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

i. name-code;

(d) applicable holding patterns;

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

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

***Note**: In accordance with Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Volume II, information on close-in obstacles is provided by the procedures specialist.*

(g) area speed restrictions, where established;

(h) for PBN procedures, a PBN requirementsbox;

Note.— Refer to the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part III, Section 5 for information on a PBN requirements box.

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

(j) radio communication procedures, including:

1. call sign(s) of ATS unit(s);
2. frequency and, if applicable, SATVOICE number;

3. transponder setting, where appropriate;

(k) an indication of “flyover” significant points.

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

8.9.4.3. Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the Procedures for Air Navigation Services — Aircraft Operations (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.

***Note**: Appropriate data are those provided by the procedures specialist.*

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9. STANDARD ARRIVAL CHART — INSTRUMENT (STAR) — ICAO

9.1. 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.

***Note 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.*

***Note 2**: Provisions governing the identification of standard arrival routes are in AAR – ATS, Appendix 3; guidance material relating to the establishment of such routes is contained in the Air Traffic Services Planning Manual (Doc 9426).*

9.2. Availability

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

9.3. Coverage and Scale

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

9.3.2. The chart shall be drawn to scale.

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

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

9.4. Projection

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

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

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

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 arrival route(s) — instrument as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Volume II, Part I, Section 4, Chapter 2.

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

9.6. Culture and Topography

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.

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

***Note 1**: 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.*

***Note 2**: 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.*

***Note 3**: Appropriate spot elevations and obstacles are those provided by the procedures specialist.*

9.7. Magnetic Variation

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

9.8. Bearings, Tracks and Radials

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

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

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

9.9. Aeronautical Data

9.9.1. Aerodromes

9.9.1.1. The aerodrome of landing shall be shown by the runway pattern.

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

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.

9.9.3. Minimum sector altitude

9.9.3.1. The established minimum sector altitude shall be shown with a clear indication of

the sector to which it applies.

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

***Note 1**: Quadrilaterals formed by the parallels and meridians normally correspond to the half degree of latitude and longitude. Regardless of the chart scale being used, the area minimum altitude relates to the consequent quadrilateral.*

Note 2: Refer to the Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Volume II, Part I, Section 2, Chapter 1, 1.8, for method for determination of area minimum altitude.

9.9.4. Air traffic services system

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

10.9.4.1.1 The components shall comprise the following:

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

1. route designator;
2. significant points defining the route;
3. track or radial to the nearest degree along each segment of the route;
4. distances to the nearest kilometre or nautical mile between significant points;
5. minimum obstacle clearance altitudes, along the route or route segments and altitudes required by the procedure to the nearest higher 50 m or 100 ft and flight level restrictions where established;
6. where the chart is drawn to scale and vectoring on arrival is provided, established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;

***Note 1:** Where ATS surveillance systems are used to vector aircraft to or from significant points on a published standard arrival route or to issue clearance for descent below the minimum sector altitude during arrival, the relevant procedures may be shown on the Standard Arrival Chart — Instrument (STAR) — ICAO unless excessive chart clutter will result.*

***Note 2:** Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — ICAO may be provided (see Chapter 20), in which case the elements indicated by 9.9.4.1.1 a) 6), need not be duplicated on the Standard Arrival Chart — Instrument (STAR) — ICAO.*

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

1. when the radio navigation aid is used for conventional navigation:
   i. plain language name;
   ii. identification;
   iii. Morse code;
   iv. frequency;
   v. geographical coordinates in degrees, minutes and seconds and;

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

2. when the radio navigation aid is used as a significant point for area navigation:
   i. plain language name; and
   ii. identification;

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

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

   i. name-code;

   ii. geographical coordinates in degrees, minutes and seconds;

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

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

   v. identification of the reference radio navigation aid;

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

   i. name-code;

(d) applicable holding patterns;

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

(f) area speed restrictions, where established;

(g) for PBN procedures, a PBN requirements box;

Note.— Refer to the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part III, Section 5 for information on a PBN requirements box.

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

(i) radio communication procedures, including:

1. call sign(s) of ATS unit(s);
2. frequency and, if applicable, SATVOICE number;
3. transponder setting, where appropriate;

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

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

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

9.9.4.3. Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the Procedures for Air Navigation Services — Aircraft Operations (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.

***Note**: Appropriate data are those provided by the procedures specialist*

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10. INSTRUMENT APPROACH CHART — ICAO

10.1. 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.

***Note**: 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 (Doc 8168).*

10.2. Availability

10.2.1. Instrument Approach Charts — ICAO shall be made available for all aerodromes used by international civil aviation where instrument approach procedures have been established by the State concerned.

10.2.2. A separate Instrument Approach Chart — ICAO shall normally be provided for each precision approach procedure established by the State.

10.2.3. A separate Instrument Approach Chart — ICAO shall normally be provided for each non-precision approach procedure established by the State.

***Note**: 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.*

10.2.4. 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.

***Note**: For categories of aircraft, see Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Volume II, Part I, Section 4, Chapter 9.*

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

10.3. Coverage and Scale

10.3.1. 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.

10.3.2. The scale selected shall ensure optimum legibility consistent with:

(a) the procedure shown on the chart;

(b) sheet size.

10.3.3. A scale indication shall be given.

10.3.3.1. 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.

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

10.4. Format

The sheet size shall be 210 x 148 mm (8.27 x 5.82 in) or 297 x 210 mm (11.7 x 8.3 in).

10.5. Projection

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

10.5.2. Graduation marks shall be placed at consistent intervals along the neat lines.

10.6. 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 Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Volume II, Part I, Section 4, Chapter 9.

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

10.7. Culture and Topography

10.7.1. Culture and topographic information pertinent to the safe execution of the instrument approach procedure, including the missed approach procedure, associated holding procedures and visual maneuvering (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.

10.7.2. 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.

***Note 1:** 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.*

***Note 2:** 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.*

***Note 3:** Appropriate spot elevations are those provided by the procedures specialist.*

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

***Note 1**: 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.*

***Note 2:** 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.*

***Note 3:** Appropriate spot elevations are those provided by the procedures specialist.*

10.8. Magnetic Variation

10.8.1. The magnetic variation shall be shown.

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

10.9. Bearings, Tracks and Radials

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

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

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

10.10. Aeronautical Data

10.10.1. Aerodromes

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

10.10.1.2. 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.

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

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

10.10.2. Obstacles

10.10.2.1. Obstacles shall be shown on the plan view of the chart.

***Note**: Appropriate obstacles are those provided by the procedures specialist.*

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

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

10.10.2.4. The heights of obstacles above a datum other than mean sea level (see 10.10.2.3) shall be shown. When shown, they shall be given in parentheses on the chart.

10.10.2.5. 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.

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

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

10.10.3. 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.

10.10.4. Radio communication facilities and navigation aids

10.10.4.1. 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.

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

10.10.4.3. 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.

10.10.4.4. When the final approach fix is used for conventional navigation (or final approach point for an ILS approach procedure) it shall be identified with its geographical coordinates in degrees, minutes and seconds.

10.10.4.5. 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.

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

10.10.4.7. 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.

10.10.5. 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.

10.10.6. Portrayal of procedure tracks

10.10.6.1. 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.

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

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

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

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

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

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

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

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

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

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

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

10.10.6.4. Heights required by procedures shall be shown in parentheses, using the height datum selected in accordance with 10.10.2.5 .

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

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

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

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

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

10.10.7. Aerodrome operating minima

10.10.7.1. Aerodrome operating minima when established by the State shall be shown.

10.10.7.2. 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.

10.10.8. Supplementary information

10.10.8.1. 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.

10.10.8.2. 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.

10.10.8.3. 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.

10.10.8.4. A rate of descent table shall be shown

10.10.8.5. 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.

10.10.8.6. 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

10.10.8.7. 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.

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

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

10.10.8.10. For approach procedures having PBN segments, a PBN requirements box shall be included.

Note.— Refer to the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II, Part III, Section 5 for information on a PBN requirements box.

10.10.9. Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Volume II, Part III,

Section 5, Chapter 2, 2.3, for PBN procedures and Volume II, Part I, Section 4, Chapter 9, 9.4.1.3, for non-PBN procedures, on the verso of the chart or as a separate, properly referenced sheet.

***Note**: Appropriate data are those provided by the procedures specialist.*

11. VISUAL APPROACH CHART — ICAO

11.1. 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.

11.2. Availability

The Visual Approach Chart — ICAO shall be made available in the manner prescribed in 0.12.2 , 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.

11.3. Scale

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

11.3.2. The scale shall not be smaller than 1:500 000.

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

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

11.4. Format

The sheet size shall be 210 x 148 mm (8.27 x 5.82 in) (A5) or 297 x 210 mm (11.7 x 8.3 in) (A4).

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

11.5. Projection

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

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

11.6. Identification

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

11.7. Culture and Topography

11.7.1. Natural and cultural landmarks shall be shown (e.g. bluffs, cliffs, sand dunes, cities,

towns, roads, railroads, isolated lighthouses).

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

11.7.2. Shore lines, lakes, rivers and streams shall be shown

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

11.7.4. When shown, spot elevations shall be carefully selected

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

11.7.5. The figures relating to different reference levels shall be clearly differentiated in their presentation.

11.8. Magnetic Variation

The magnetic variation shall be shown.

11.9. Bearings, Tracks and Radials

11.9.1. Bearings, tracks and radials shall be magnetic.

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

11.10. Aeronautical Data

11.10.1. Aerodromes

11.10.1.1. 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.

11.10.1.2. The aerodrome elevation shall be shown in a prominent position on the chart

11.10.2. Obstacles

11.10.2.1. Obstacles shall be shown and identified.

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

11.10.2.3. The heights of obstacles above the aerodrome elevation shall be shown.

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.

11.10.3. Prohibited, restricted and danger areas

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

11.10.4. Designated airspace

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

11.10.5. Visual approach information

11.10.5.1. Visual approach procedures shall be shown where applicable.

11.10.5.2. Visual aids for navigation shall be shown as appropriate.

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

11.10.6. Supplementary information

11.10.6.1. Radio navigation aids together with their frequencies and identifications shall be shown as appropriate.

11.10.6.2. Radio communication facilities with their frequencies shall be shown as appropriate

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12. AERODROME/HELIPORT CHART — ICAO

12.1. 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.

12.2. Availability

12.2.1. The Aerodrome/Heliport Chart — ICAO shall be made available in the manner prescribed in 0.12.2 for all aerodromes/heliports regularly used by international civil aviation.

12.2.2. The Aerodrome/Heliport Chart — ICAO should be made available also, in the manner prescribed in 0.12.2 , for all other aerodromes/heliports available for use by international civil aviation.

***Note**: Under certain conditions, an Aerodrome Ground Movement Chart — ICAO and an Aircraft Parking/Docking Chart — ICAO may have to be provided (see Chapters 13 and 14); in which case, the elements portrayed on these supplementary charts need not be duplicated on the Aerodrome/Heliport Chart — ICAO.*

12.3. Coverage and Scale

12.3.1. The coverage and scale shall be sufficiently large to show clearly all the elements listed in 12.6.1.

12.3.2. A linear scale shall be shown.

12.4. 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.

12.5. Magnetic Variation

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

12.6. Aerodrome/Heliport Data

12.6.1. 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;

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

(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;

***Note**: Bearing strengths or aircraft type restrictions may be shown in tabular form on the face or verso of the chart.*

(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;

***Note**: Bearing strengths or aircraft type restrictions may be shown in tabular form on the face or verso of the chart.*

(h) where established, hot spot locations with additional information properly annotated;

***Note**: Additional information regarding hot spots may be shown in tabular form on the face or verso of the chart.*

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

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

(k) the boundaries of the air traffic control service;

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

(m) approach and runway lighting;

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

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

(p) obstacles to taxiing;

(q) aircraft servicing areas and buildings of operational significance;

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

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

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

12.6.3. In addition to the items in 12.6.1 relating to heliports, the chart shall show:

(a) heliport type;

(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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13. AERODROME GROUND MOVEMENT CHART — ICAO

13.1. Function

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

13.2. Availability

The Aerodrome Ground Movement Chart — ICAO should be made available in the manner prescribed in 0.12.2 where, due to congestion of information, details necessary for the ground movement of aircraft along the taxiways to and from the aircraft stands cannot be shown with sufficient clarity on the Aerodrome/Heliport Chart — ICAO.

13.3. Coverage and Scale

13.3.1. The coverage and scale shall be sufficiently large to show clearly all the elements listed in 13.6.

13.3.2. A linear scale shall be shown.

13.4. Identification

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

13.5. Magnetic Variation

13.5.1. A True North arrow shall be shown.

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

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

13.6. Aerodrome Data

13.6.1. This chart shall show in a similar manner all the information on the Aerodrome/Heliport Chart — ICAO relevant to the area depicted, including:

(a) apron elevation to the nearest metre or foot;

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

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

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

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

***Note**: Additional information regarding hot spots may be shown in tabular form on the face or verso of the chart.*

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

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

(h) the boundaries of the air traffic control service;

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

(j) obstacles to taxiing;

(k) aircraft servicing areas and buildings of operational significance;

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

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

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

14. AIRCRAFT PARKING/DOCKING CHART — ICAO

14.1. Function

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

14.2. Availability

The Aircraft Parking/Docking Chart — ICAO shall be made available in the manner prescribed in 0.12.2 , where, due to the complexity of the terminal facilities, the information cannot be shown with sufficient clarity on the Aerodrome/Heliport Chart — ICAO or on the Aerodrome Ground Movement Chart — ICAO.

14.3. Coverage and Scale

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

14.3.2. A linear scale shall be shown.

14.4. Identification

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

14.5. Magnetic Variation

14.5.1. A True North arrow shall be shown.

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

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

14.6. Aerodrome Data

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

(a) apron elevation to the nearest metre or foot;

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

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

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

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

***Note**: Additional information regarding hot spots may be shown in tabular form on the face or verso of the chart.*

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

(g) the boundaries of the air traffic control service;

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

(i) obstacles to taxiing;

(j) aircraft servicing areas and buildings of operational significance;

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

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

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

15.1. Function

This chart shall provide information to satisfy the requirements of visual air navigation.

***Note**: This chart may also serve:*

(a) as a basic aeronautical chart:

1. when highly specialized charts lacking visual information do not provide essential data;
2. to provide complete world coverage at a constant scale with a uniform presentation of planimetric data;
3. in the production of other charts required by international civil aviation;

(b) as a pre-flight planning chart.

15.2. Availability

15.2.1. The World Aeronautical Chart — ICAO 1:1 000 000 shall be made available in the manner prescribed in 0.12.2 for all areas delineated in Appendix 5.

***Note**: When operational or chart production considerations indicate that operational requirements can be effectively satisfied by Aeronautical Charts — ICAO 1:500 000 or Aeronautical Navigation Charts — ICAO Small Scale, either of these charts may be made available instead of the basic 1:1 000 000 chart.*

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

15.3. Scales

15.3.1. 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.

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

15.3.2. A conversion scale (metres/feet) shall be shown in the margin.

15.4. Format

15.4.1. The title and marginal notes shall be in one of the working languages of ICAO.

***Note**: The language of the publishing country may be used in addition to the ICAO working language.*

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

15.4.3. The method of folding shall be as follows:

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

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

Note 1: *The area covered by a sheet may vary from the lines shown to satisfy particular requirements.*

Note 2: *The value of adopting identical sheet lines for ICAO 1:1 000 000 Charts and the corresponding sheet of the International Map of the World (IMW), provided aeronautical requirements are not compromised, is recognized.*

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

15.5. Projection

15.5.1. The charts shall be use:

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

15.5.2. Graticules and graduations shall be shown as follows:

(a) Parallels:

Latitude	*Distance between parallels*	*Graduations on parallels*
0° to 72°	30’	1’

(b) Meridians:

Latitude	*Distance between meridians*	*Graduations on meridians*
0° to 52°	30’	1’

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

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

15.5.4. All meridians and parallels shown shall be numbered in the borders of the chart. In addition, each parallel shall be numbered within the body of the chart in such a manner that the parallel can be readily identified when the chart is folded.

Note*: Meridians may be numbered within the body of the chart.*

15.5.5. The name and basic parameters of the projection shall be indicated in the margin.

15.6. Identification

Sheet numbering shall be in conformity with the index in Appendix 5.

***Note**: The corresponding International Map of the World (IMW) sheet number may also be shown.*

15.7. Culture and Topography

15.7.1. Built-up areas

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

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

15.7.2. Railroads

15.7.2.1. All railroads having landmark value shall be shown.

***Note 1**: In congested areas, some railroads may be omitted in the interest of legibility.*

***Note 2**: Railroads may be named where space permits.*

15.7.2.2. Important tunnels shall be shown.

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

15.7.3. Highways and roads

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

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

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

15.7.4. Landmarks

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

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

15.7.5. Political boundaries

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

15.7.6. **Hydrography**

15.7.6.1. 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.

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

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

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

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

15.7.7. **Contours**

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

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

15.7.8. **Hypsometric tints**

15.7.8.1. When hypsometric tints are used, the range of elevations for the tints shall be shown.

15.7.8.2. The scale of the hypsometric tints used on the chart shall be shown in the margin.

15.7.9. **Spot elevations**

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

15.7.9.2. 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.

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

15.7.10. **Incomplete or unreliable relief**

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

15.7.10.2. 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.”

15.7.11. Escarpments

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

15.7.12. Wooded areas

15.7.12.1. Wooded areas shall be shown.

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

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

15.7.13. Date of topographic information

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

15.8. Magnetic Variation

15.8.1. Isogonic lines shall be shown.

15.8.2. The date of the isogonic information shall be indicated in the margin.

15.9. Aeronautical Data

15.9.1. General

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

15.9.2. Aerodromes

15.9.2.1. 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.

15.9.2.2. 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.

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

15.9.3. Obstacles

15.9.3.1. Obstacles shall be shown.

***Note**: Objects of a height of 100 m (300 ft) or more above ground are normally regarded as obstacles.*

15.9.3.2. When considered of importance to visual flight, prominent transmission lines, permanent cable car installations and wind turbines, which are obstacles, shall

be shown.

15.9.4. Prohibited, restricted and danger areas

Prohibited, restricted and danger areas shall be shown.

15.9.5. Air traffic services system

15.9.5.1. 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.

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

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

15.9.6. 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.

15.9.7. Supplementary information

15.9.7.1. Aeronautical ground lights together with their characteristics or their identifications or both shall be shown.

15.9.7.2. 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.

16. AERONAUTICAL CHART — ICAO 1:500 000

16.1. 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.

***Note 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.

***Note 2**: 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.*

***Note 3**: Where States produce charts of this series covering their national territories, the entire area being portrayed is usually treated on a regional basis.*

16.2. Availability

The Aeronautical Chart — ICAO 1:500 000 should be made available in the manner prescribed in 0.12.2 for all areas delineated in Appendix 5.

***Note:** The selection of this scale as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000 is covered by 15.2.1 and 15.2.2 16.2.2.*

16.3. Scales

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

— KILOMETRES,

— NAUTICAL MILES,

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

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

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

16.4. Format

16.4.1. The title and marginal notes shall be in one of the working languages of ICAO.

***Note**: The language of the publishing country or any other language may be used in addition to the ICAO working language.*

16.4.2. 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.

16.4.3. 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.

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

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

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

16.5. Projection

16.5.1. A conformal (orthomorphic) projection shall be used.

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

16.5.3. Parallels shall be shown at intervals of 30’.

16.5.3.1. Meridians shall normally be shown at intervals of 30’.

***Note**: At high latitudes, this interval may be increased.*

16.5.4. 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.

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

16.5.5. All meridians and parallels shown shall be numbered in the borders of the chart.

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

16.5.6. The name and basic parameters of the projection shall be indicated in the margin.

16.6. Identification

16.6.1. 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.

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

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

16.7. Culture and Topography

16.7.1. Built-up areas

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

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

16.7.2. Railroads

16.7.2.1. All railroads having landmark value shall be shown.

Note 1: *In congested areas, some railroads may be omitted in the interest of legibility.*

Note 2*: Railroads may be named.*

Note 3: *Rail stations may be shown.*

16.7.2.2. Tunnels shall be shown when they serve as prominent landmarks.

Note*: A descriptive note may be added, if necessary, to accentuate this feature.*

16.7.3. Highways and roads

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

Note*: Roads under construction may be shown.*

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

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

16.7.4. Landmarks

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

importance for visual air navigation, shall be shown.

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

16.7.5. Political boundaries

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

***Note**: Other boundaries may be shown.*

16.7.6. Hydrography

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

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

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

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

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

16.7.7. Contours

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

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

16.7.8. Hypsometric tints

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

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

16.7.9. Spot elevations

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

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

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

16.7.10. **Incomplete or unreliable relief**

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

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

"WARNING — THE RELIABILITY OF RELIEF INFORMATION ON THIS CHART IS DOUBTFUL AND ELEVATIONS SHOULD BE USED WITH CAUTION."

16.7.11. **Escarpments**

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

16.7.12. **Wooded areas**

16.7.12.1. Wooded areas shall be shown.

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

16.7.13. **Date of topographic information**

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

16.8. Magnetic Variation

16.8.1. Isogonic lines shall be shown.

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

16.9. Aeronautical Data

16.9.1. **General**

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

16.9.2. **Aerodromes**

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

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

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

16.9.3. **Obstacles**

16.9.3.1. Obstacles shall be shown.

***Note**: Objects of a height of 100 m (300 ft) or more above ground are normally regarded as obstacles.*

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

16.9.4. **Prohibited, restricted and danger areas**

Prohibited, restricted and danger areas shall be shown.

16.9.5. **Air traffic services system**

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

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

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

16.9.6. **Radio navigation aids**

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

16.9.7. **Supplementary information**

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

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

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

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

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

17. AERONAUTICAL NAVIGATION CHART — ICAO SMALL SCALE

17.1. Function

This chart shall:

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

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

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

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

17.2. Availability

The Aeronautical Navigation Chart — ICAO Small Scale should be made available in the manner prescribed in 0.12.2 for all areas delineated in Appendix 5.

***Note**: The selection of this scale as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000 is covered by 15.2.1 and 15.2.2.*

17.3. Coverage and Scale

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

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

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

17.3.2. The scale shall be in the range of 1:2 000 000 to 1:5 000 000.

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

17.3.4. Linear scales for kilometres and nautical miles arranged in the following order:

— KILOMETRES,

— NAUTICAL MILES,

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

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

17.3.6. A conversion scale (metres/feet) shall be shown in the margin.

17.4. Format

17.4.1. The title and marginal notes shall be in one of the working languages of ICAO.

***Note**: The language of the publishing country or any other language may be used in addition to the ICAO working language.*

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

***Note**: There is no internationally agreed sheet numbering.*

17.5. Projection

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

17.5.1.1. The name and basic parameters of the projection shall be shown in the margin.

17.5.2. Parallels shall be shown at intervals of 1°.

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

17.5.3. Meridians shall be shown at intervals compatible with the latitude and the scale of the chart.

17.5.3.1. Graduations on the meridians shall be shown at intervals not exceeding 5'.

17.5.4. The graduation marks shall extend away from the Greenwich Meridian and from the Equator.

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

17.6. Culture and Topography

17.6.1. **Built-up areas**

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

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

17.6.2. **Railroads**

17.6.2.1. All railroads having landmark value shall be shown.

***Note**: In congested areas, some railroads may be omitted in the interest of legibility.*

17.6.2.2. Important tunnels shall be shown.

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

17.6.3. **Highways and roads**

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

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

17.6.4. Landmarks

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

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

17.6.5. Political boundaries

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

17.6.6. Hydrography

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

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

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

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

17.6.7. Contours

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

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

17.6.8. Hypsometric tints

17.6.8.1. When hypsometric tints are used, the range of elevations for the tints shall be shown.

17.6.8.2. The scale of the hypsometric tints used on the chart shall be shown in the margin.

17.6.9. Spot elevations

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

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

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

17.6.10. **Incomplete or unreliable relief**

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

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

"WARNING — THE RELIABILITY OF RELIEF INFORMATION ON THIS CHART IS DOUBTFUL AND ELEVATIONS SHOULD BE USED WITH CAUTION."

17.6.11. **Escarpments**

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

17.6.12. **Wooded areas**

Wooded areas of large extent shall be shown.

17.6.13. **Date of topographic information**

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

17.6.14. **Colours**

17.6.14.1. Subdued colours shall be used for the chart background to facilitate plotting.

17.6.14.2. Good colour contrast shall be ensured to emphasize features important to visual air navigation.

17.7. Magnetic Variation

17.7.1. Isogonic lines shall be shown.

17.7.2. The date of isogonic information shall be indicated in the margin.

17.8. Aeronautical Data

17.8.1. **Aerodromes**

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

17.8.2. Obstacles

Obstacles shall be shown.

17.8.3. Prohibited, restricted and danger areas

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

17.8.4. Air traffic services system

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

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

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

17.8.5. Radio navigation aids

***Note**: Radio aids to navigation may be shown by the appropriate symbol and named.*

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18. PLOTTING CHART — ICAO

18.1. Function

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

18.2. Availability

This chart should be made available, in the manner prescribed in 0.12.2 to cover major air routes over oceanic areas and sparsely settled areas used by international civil aviation.

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

18.3. Coverage and Scale

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

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

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

18.4. Format

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

18.5. Projection

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

18.5.2. Parallels and meridians shall be shown.

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

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

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

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

18.6. Identification

Each sheet shall be identified by chart series and number.

18.7. Culture and Topography

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

18.7.2. Spot elevations for selected features constituting a hazard to air navigation shall be shown.

18.7.3. Particularly hazardous or prominent relief features shall be emphasized.

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

18.8. Magnetic Variation

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

18.8.2. The date of the isogonic information shall be shown.

18.9. Aeronautical Data

18.9.1. The following aeronautical data shall be shown:

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

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

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

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

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

(f) ocean station vessels.

***Note**: Other aeronautical data may be shown provided that they do not detract from the legibility of essential information.*

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

19. ELECTRONIC AERONAUTICAL CHART DISPLAY — ICAO

19.1. Function

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

19.2. Information Available for Display

19.2.1. The Electronic Aeronautical Chart Display — ICAO shall be capable of displaying all aeronautical, cultural and topographic information required by Chapter 4 and Chapters 6 through 18.

***Note**: The Electronic Aeronautical Chart Display — ICAO may display supplementary information, in addition to that required for the equivalent paper chart, which may be considered useful for safe navigation.*

19.3. Display Requirements

19.3.1. Display categories

19.3.1.1. Information available for display shall be subdivided into the following categories:

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

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

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

19.3.2. Display mode and generation of neighboring area

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

***Note**: Other modes, such as static chart displays, may be available.*

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

19.3.3. Scale

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

19.3.4. Symbols

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

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

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

(c) do not impair the legibility of the display.

***Note**: Additional details for each symbol may be added according to the resolution of the output media, but any enhancements may not change the basic recognizability of the symbol.*

19.3.5. **Display hardware**

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

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

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

19.3.5.4. The display luminance shall be adjustable by the flight crew.

19.4. Provision and Updating of Data

19.4.1. The provision and updating of data for use by the display shall be in conformance with the aeronautical data quality system requirements.

***Note**: For aeronautical data quality system requirements, see Chapter 2, 2.17, and AAR - AIS, Chapter 3, 3.2.*

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

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

19.4.4. A record shall be kept of all updates, including date and time of application.

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

19.5. Performance Tests, Malfunction Alarms and Indications

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

19.5.2. A suitable alarm or indication of system malfunction shall be provided.

19.6. Back-up Arrangements

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

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

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

***Note**: A suitable back-up system may include the carriage of paper charts.*

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20. ATC SURVEILLANCE MINIMUM ALTITUDE CHART — ICAO

20.1. Function

20.1.1. 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.

Note: *The objectives of the air traffic control service as prescribed in AAR - ATS do not include prevention of collision with terrain. The procedures prescribed in the ATM Manual 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 ATM Manual, Chapter 8, 8.6.5.2, applies..*

20.1.2. 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.

20.2. Availability

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

20.3. Coverage and Scale

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

20.3.2. The chart shall be drawn to scale.

20.3.3. The chart shall be drawn to the same scale as the associated Area Chart — ICAO.

20.4. Projection

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

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

20.5. 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.

Note*: 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.*

20.6. Culture and Topography

20.6.1. 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.

20.6.2. Appropriate spot elevations and obstacles shall be shown.

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

20.7. Magnetic Variation

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

20.8. Bearings, Tracks and Radials

20.8.1. Bearings, tracks and radials shall be magnetic.

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

20.9. Aeronautical Data

20.9.1. **Aerodromes**

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

20.9.1.2. The elevation of the primary aerodrome to the nearest metre or foot shall be shown.

20.9.2. **Prohibited, restricted and danger areas**

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

20.9.3. **Air traffic services system**

20.9.3.1. 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;

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

(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;

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

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.

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

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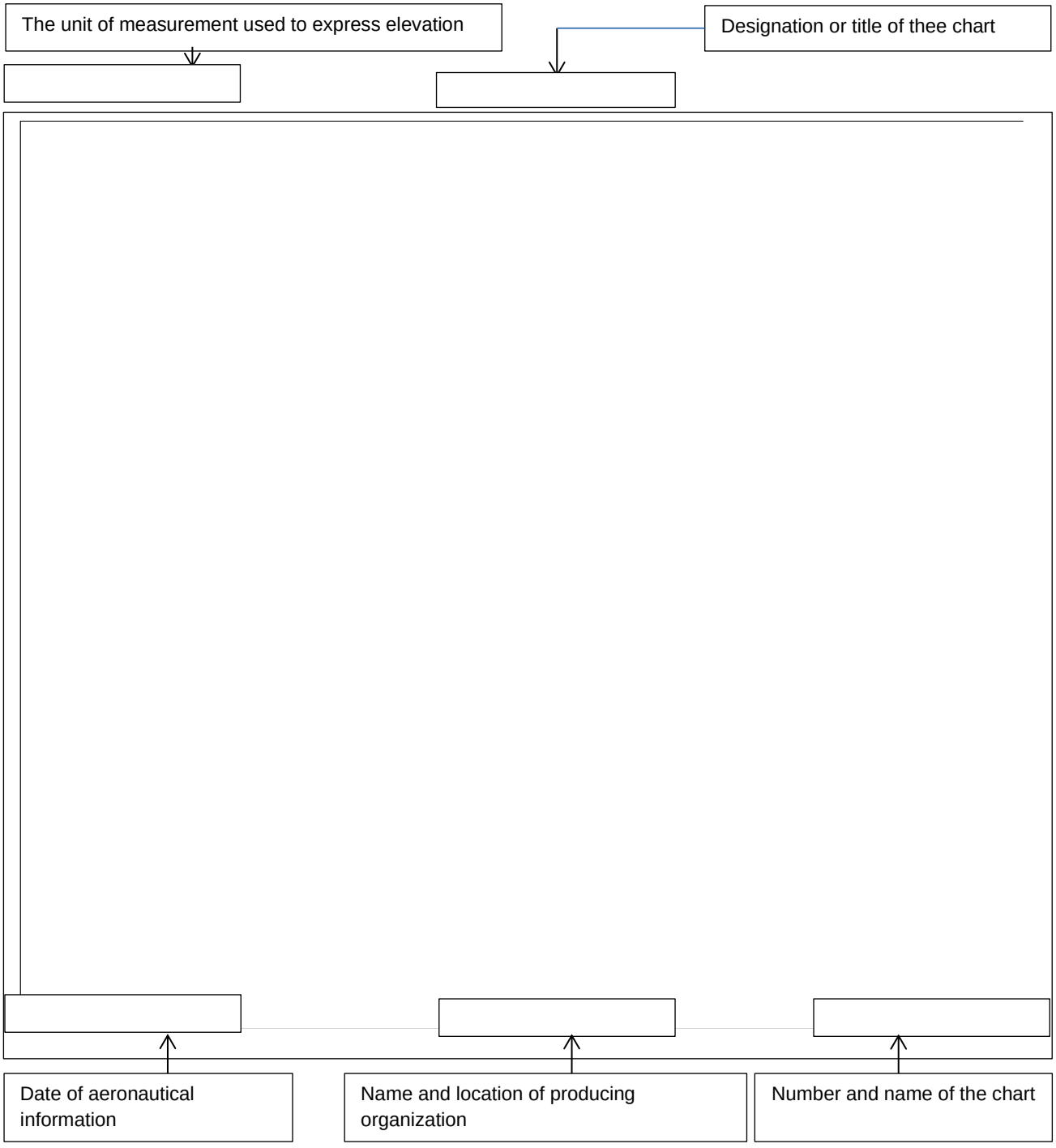
APPENDIX 1: MARGINAL NOTE LAYOUT



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APPENDIX 2: ICAO CHART SYMBOLS

	Symbol No.
TOPOGRAPHY (1–18)	
Approximate contours	2
Areas not surveyed for contour information or relief data incomplete	18
Bluff, cliff or escarpment	4
Coniferous trees	15
Contours	1
Gravel	8
Highest elevation on chart	12
Lava flow	5
Levee or esker	9
Mountain pass	11
Other trees	16
Palms	17
Relief shown by hachures	3
Sand area	7
Sand dunes	6
Spot elevation (of doubtful accuracy)	14
Spot elevation	13
Unusual land features appropriately labelled	10
HYDROGRAPHY (19–46)	
Abandoned canal	30
Canal	29
Charted isolated rock	44
Coral reefs and ledges	22
Danger line (2 m or one fathom line)	43
Dry lake bed	39
Falls	28
Glaciers and ice caps	42
Lakes (non-perennial)	32
Lakes (perennial)	31
Large river (perennial)	23
Rapids	27
Reservoir	38
Rice field	36
Rivers and streams (non-perennial)	25
Rivers and streams (unsurveyed)	26
Rock awash	45
Salt lake	33
Salt pans (evaporator)	34
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
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6	Sand dunes	
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8	Gravel		
9	Levee or esker	Alternative	
10	Unusual land features appropriately labelled		Many Small Volcanoes; Rock Outcrop
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11	Mountain pass		5395

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

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

HYDROGRAPHY

19	Shore line (reliable)	
20	Shore line (unreliable)	
21	Tidal flats	
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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

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48	Town	
49	Village	
50	Buildings	

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

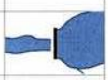
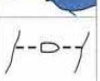
MISCELLANEOUS (Cont.)

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

RAILROADS

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

MISCELLANEOUS

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

AERODROMES

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

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

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

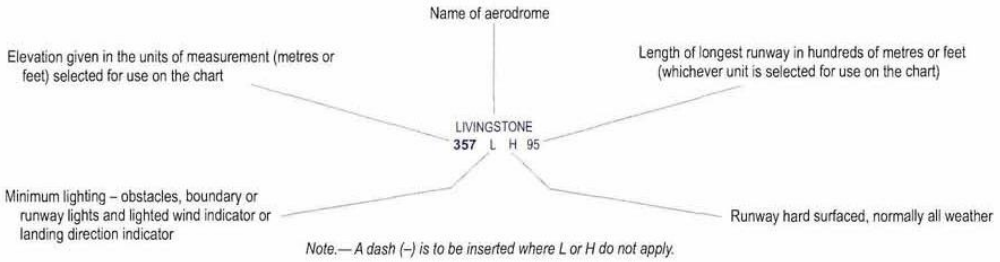
95	*Note.— Where required by the function of the chart, the runway pattern of the aerodrome may be shown in lieu of the aerodrome symbol, for example:*	

AERODROMES *(Cont.)*

AERODROME DATA IN ABBREVIATED FORM WHICH MAY BE IN ASSOCIATION WITH AERODROME SYMBOLS

(Reference: 16.9.2.2 and 17.9.2.2)

96



Note.— A dash (–) is to be inserted where L or H do not apply.

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 → KAV	
105	VOR radial	Radial bearing from, and identification of, VOR	R 090 KAV
106	UHF tactical air navigation aid	TACAN	
107	Collocated VOR and TACAN radio navigation aids	VORTAC	
108	Instrument landing system	ILS	PLAN VIEW; Electronic: FRONT COURSE, BACK COURSE; PROFILE; Electronic: GLIDE PATH
109	Radio marker beacon	Elliptical / Bone Shape	

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

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



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

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

VOR	
VOR/DME	
TACAN	
VORTAC	

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

AIR TRAFFIC SERVICES

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

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

Significant Point Functionality

			Significant point depiction for conventional navigation		Significant point depiction for area navigation			
		REPORTING FLY-BY/FLY-OVER	On request (NA)	Compulsory (NA)	On request fly-by	Compulsory fly-by	On request flyover	Compulsory flyover
121	Basic Symbols with functionality	VFR reporting point	△	▲	△	▲	△	▲
		Intersection INT	△	▲	△	▲	△	▲
		VORTAC						
		TACAN						
		VOR						
		VOR/DME						
		NDB						
		Waypoint WPT	Not used	Not used				

For details on use and meaning of these symbols, refer to paragraph 2.4

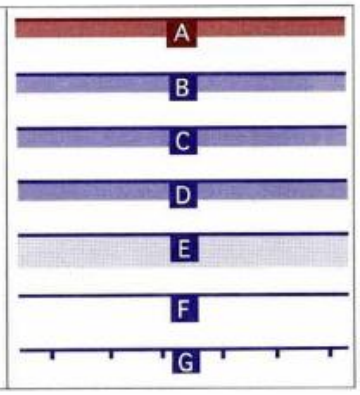
122	Change-over point To be superimposed on the appropriate route symbol at right angles to the route	COP	26 / 36	123	ATS/MET reporting point	MRP	Compulsory On request	124	Final approach fix FAF

AIR TRAFFIC SERVICES *(cont.)*

125	Procedure altitudes/flight levels	Altitude/flight level "window"	17 000 10 000	FL 220 10 000
		"At or above" altitude/flight level	7 000	FL 070
		"At or below" altitude/flight level	5 000	FL 050
		"At" altitude/flight level	3 000	FL 030
		"Recommended" altitude/flight level	5 000	FL 050
		"Expected" altitude/flight level	Expect 5 000	Expect FL 050

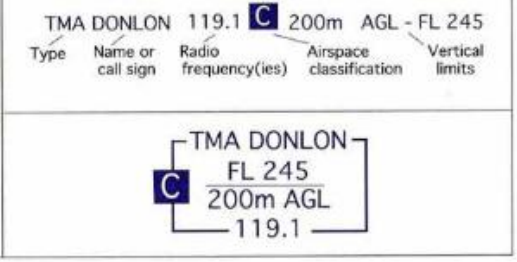
AIRSPACE CLASSIFICATIONS

126 Airspace classifications



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

127 Alternative



AIRSPACE RESTRICTIONS

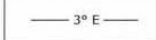
128	Restricted airspace (prohibited, restricted or danger area)		Common boundary of two areas	
	Note.—The angle and density of rulings may be varied according to scale and the size, shape and orientation of the area.			
129	International boundary closed to passage of aircraft except through air corridor			

OBSTACLES

130	Obstacle		134	Exceptionally high obstacle (optional symbol)
131	Lighted obstacle		135	Exceptionally high obstacle — lighted (optional symbol) *Note.— For obstacles having a height of the order of 300 m (1 000 ft) above terrain.*
132	Group obstacles		136	Elevation of top (italics) — *52* / (15) — Height above specified datum (upright type in parentheses)
133	Lighted group obstacles			

MISCELLANEOUS

137	Prominent transmission line		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

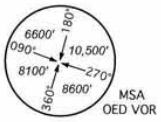
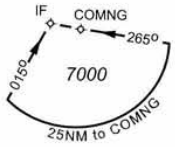
142	Marine light *Note 2.– Characteristics are to be indicated as follows:*	F Alt Alternating B Blue F Fixed	*Note 1.– Marine alternating lights are red and white unless otherwise indicated. Marine lights are white unless colours are stated.* Fl Flashing G Green Gp Group Occ Occulting R Red SEC Sector 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	
146	Pierced steel plank or steel mesh runway				
147	Unpaved runway		155	Obstacle light	
148	Stopway SWY		156	Landing direction indicator (lighted)	
149	Taxiways and parking areas		157	Landing direction indicator (unlighted)	
			158	Stop bar	
150	Helicopter alighting area on an aerodrome	H	159	Runway-holding position Pattern A Pattern B *Note.– For application, see Annex 14, Volume I, 5.2.10.*	
151	Aerodrome reference point ARP				
152	VOR check-point		160	Intermediate holding position *Note.– For application, see Annex 14, Volume I, 5.2.11.*	
153	Runway visual range (RVR) observation site		161	Hot spot *Note.– Hot spot location to be circled.*	

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

		Plan	Profile			Plan	Profile
162	Tree or shrub		Identification number	167	Terrain penetrating obstacle plane		
163	Pole, tower, spire, antenna, etc.			168	Escarpment		
164	Building or large structure			169	Stopway SWY		
165	Railroad			170	Clearway CWY		
166	Transmission line or overhead cable						

	PLAN VIEW		Electronic
171	Minimum sector altitude *Note.— This symbol may be modified to reflect particular sector shapes.*	MSA	
172	Terminal arrival altitude *Note.— This symbol may be modified to reflect particular TAA shapes.*	TAA	
173	Holding pattern		
174	Missed approach track		

PROFILE

175	Runway	
176	Radio navigation aid (type of aid and its use in the procedure to be annotated on top of the symbol)	
177	Radio marker beacon (type of beacon to be annotated on top of the symbol)	
178	Collocated radio navigation aid and marker beacon (type of aid to be annotated on top of the symbol)	
179	DME fix (distance from DME and the fix use in the procedure to be annotated on top of the symbol)	
180	Collocated DME fix and marker beacon (distance from DME and the type of beacon to be annotated on top of the symbol)	

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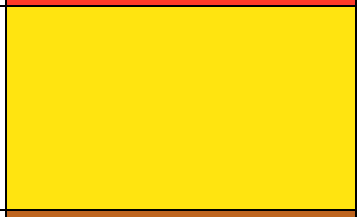
APPENDIX 3: COLOUR GUIDE

(Ref. 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: 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	
Lange non-perennial rivers and non-perennial lakes		BLUE Stipple	
Aeronautical data, except for Enroute and Area Charts -IC–O , 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	
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	GREEN	
			WHITE	
	BLUE-GREEN	Tint for areas below sea level	BLUE-GREEN	
			LIGHT GREY	

***Note**: Basic tints are identical to those specified for the international Map of the World*

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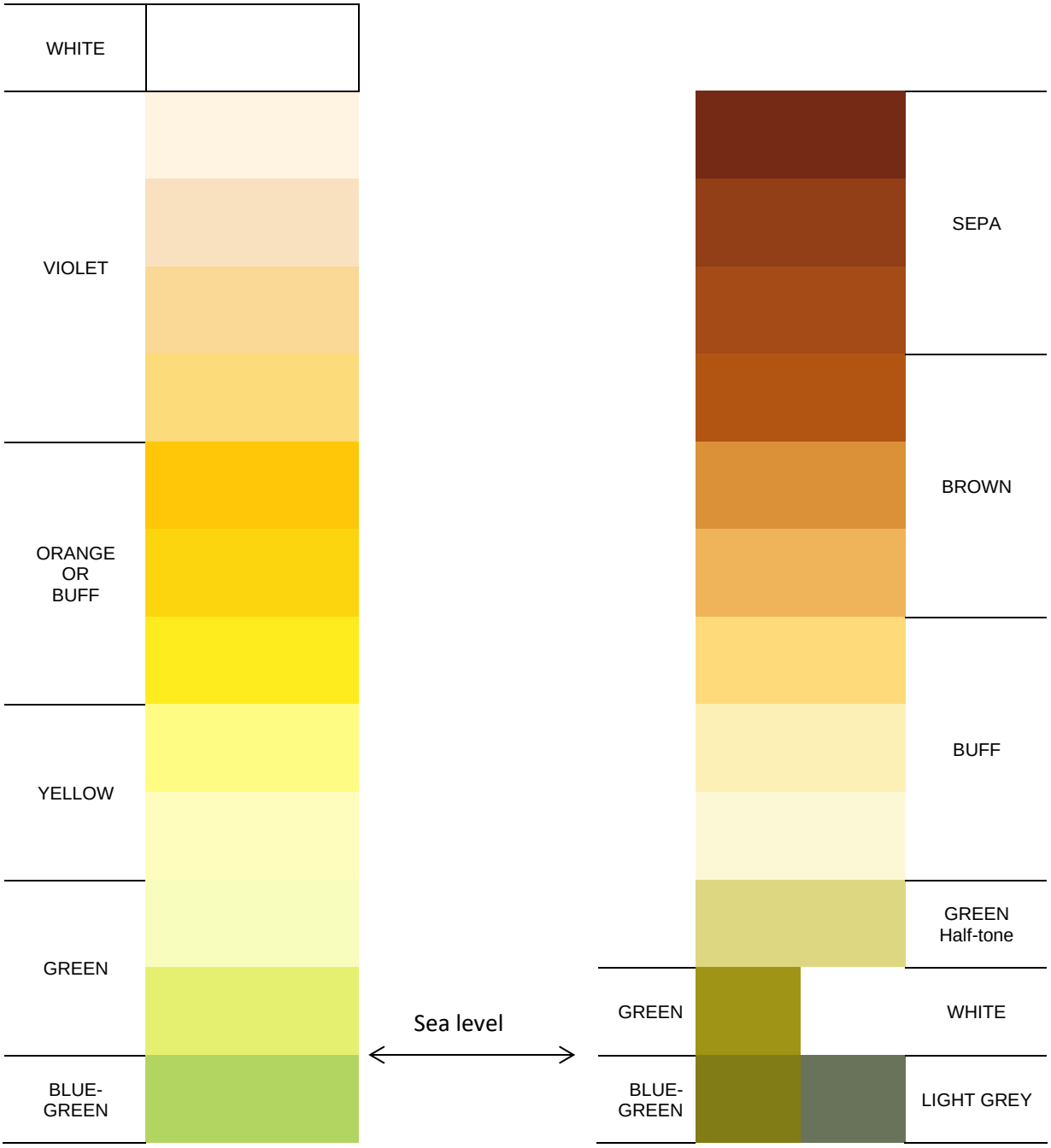
APPENDIX 4: HYPSOMETRIC TINT GUIDE

(Alternative systems, reference 2.12.2)



***Note 1**: These tints are identical to those specified for the International Map of the World.*

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

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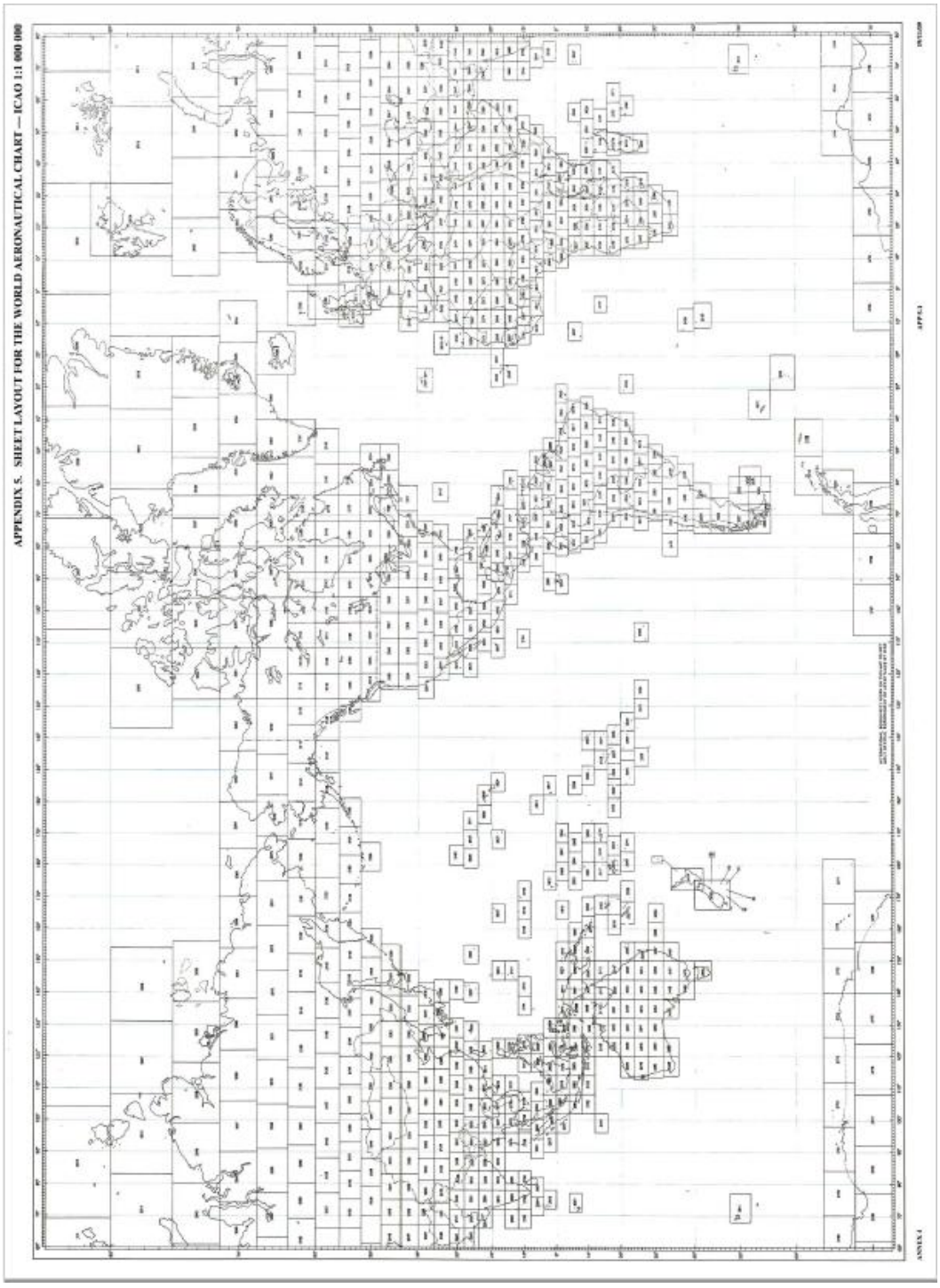
APPENDIX 5: SHEET LAYOUT FOR THE WORLD

AERONAUTICAL CHART – ICAO 1:1 000 000



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