

**Kingdom of Saudi Arabia
General Authority of Civil Aviation**

GACA REGULATION

Section 4 Aeronautical Charts

Edition 4.0

FOREWORD

The following Regulations governing Air Navigation Services (ANS) are based on Articles 2, 3, 4, 5, 89, 90, 94, 175 and 177 of the Civil Aviation Act that has been approved by the Council of Ministers Resolution No. 185 dated 17/07/1426H and issued by the Royal Decree No. M/44 dated 18/07/1426H. (23/08/2005G), and are in accordance with ICAO Annex 4 Aeronautical Charts and its related documents.

The promulgation of this regulation is based on the authority granted in Article 179 of the Civil Aviation Act, and is issued under the authority of the President, General Authority of Civil Aviation, as a duly delegated representative of the GACA Board of Directors, in accordance with Order No.T-41, dated 30/12/1429H (28/12/2008G).

The General Authority of Civil Aviation is responsible for the preparation and distribution of all regulations in sufficient quantities so that all service providers and aircraft operators based in the Kingdom of Saudi Arabia are able to obtain an authentic copy prior to the effective date of the Regulation.

APPROVED:

Original Signed by

Fahad Bin Abdullah Al-Saud
President, General Authority of Civil Aviation

Effective Date: 13 November 2014

CONTENT RULES**1) Organization Structure:**

- a) GACA has established an Air Navigation System Safety Division (ANS Safety) within the Safety Department (SD) of the Safety and Air Transport Sector (S&AT) with the following responsibilities:
1. Ensure and enforce compliance with the applicable regulations and procedures of GACAR Section 4 including the identification of conditions and circumstances under which Air Navigation Services Sector – Aeronautical Information Services (GACA-ANS AIS) are allowed to deal with, and resolve, events involving certain deviations internally, within the context of the ANS safety management system (SMS);
 2. Perform safety oversight functions include audits, inspections, investigations and data analysis;
 3. Conduct on site facilities audits based on pre-established annual audit program and frequent inspections of areas of greater safety concern or need, as identified by the analysis of data, or as instructed by senior management;
 4. Ensure the capture and storage of data on safety risks and deviations;
 5. Perform analysis of the stored data and actively exchange safety information with the concerned departments within Air navigation services;
 6. Organize internal training, communication and dissemination of safety information; and
 7. Promote dissemination of safety information to support, within GACA-ANS Services, the development of an organizational culture that fosters an effective and efficient Safety Management System
- b) Under current arrangements for the provision of AIS in Kingdom of Saudi Arabia, the GACA is responsible for carrying out the aeronautical chart production activity. GACA has delegated this activity to GACA-ANS AIS Department.
- c) The Aeronautical Charts Section, a unit within the AIS Department, is responsible for the production of all aeronautical charts and graphics required for inclusion in KSA AIP.
- d) This regulation cover all the charts produced by GACA-ANS AIS Department and are based on the provisions of ICAO Annex 4. When the content of this regulation do not cover any item related to the production of charts, the AIS Department shall apply the Standards and Recommended Practices of ICAO Annex 4 and its related Documents and guidance materials.

Rules of Construction:

- a) To avoid any misunderstanding within this regulation, certain words are to be interpreted as having specific meanings when they are used, unless the context requires otherwise:
 - (1) Words importing the singular include the plural;
 - (2) Words importing the plural include the singular; and
 - (3) Words importing the masculine gender include the feminine.
- b) In this regulation, the following protocol is used:
 - (1) The words "**shall**" and "**must**" indicate that compliance is compulsory;
 - (2) The word "**should**" indicates a recommendation. It does not mean that compliance is optional but rather that, where insurmountable difficulties exist, the GACA- S&AT may accept an alternative means of compliance, provided that an acceptable safety assurance from the Air Navigation Services shows that the safety requirements will not be reduced below that intended by the requirement.
 - (3) The word "**Can**" or "**May**" is used in a permissive sense to do the act prescribed, and the words "no person may * * *" or "a person may not * * *" mean that no person is required, authorized, or permitted to do the act prescribed;
 - (4) The word "**will**" is used to express the future; and
 - (5) The word "**includes**" means "**includes but is not limited to**".

AMENDMENT PROCEDURE

The existing General Authority of Civil Aviation Regulations (GACAR) will be periodically reviewed to reflect the latest updates of International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs); it will be also amended to reflect the latest aviation safety provisions issued by GACA and other regional and international Civil Aviation organizations. A complete revised edition incorporating all amendments will be published every three years from the original effective date of this regulation. The amendment procedure shall be as follows:

1. When the General Authority of Civil Aviation (GACA) receives an amendment to any of the current ICAO Annexes that can affect the provisions of this regulation, it will be forwarded by the Vice President of International Organization Affairs to the Assistant Vice President, Safety and Air Transport (S&AT) who in turn will forward it to Aviation Regulation Department to coordinate with the concerned department to study and comments, taking into account the ICAO deadline for the reply.
2. When any GACA department or stakeholder proposes an amendment to this regulation, it will send a letter with the proposed amendment including a clear justification and argument for such amendment. Following the receipt of an amendment proposal, the S&AT will analyze this proposal and forward its comments and any proposed decision action to the S&AT Assistant Vice President.
3. An accepted amendment proposal will be prepared as draft amendment to the GACAR-Section 4 and forwarded to the originator of the amendment proposal and concerned GACA department (s) for further review and comment within a specified timeline.
4. All accepted amendments will be drafted in the form of Notices of Proposed Amendments (NPA) and forwarded to all concerned parties including stakeholders for comment within a two-month reply period. The NPA shall indicate the proposed Amendment's effective date.
5. Following the receipt of NPA replies, the S&AT will analyze the comments received and produce a new draft in consultation with the concerned GACA department. The final draft will be submitted to President of the General Authority of Civil Aviation for formal approval prior to publication.
6. The Amendment's effective date will take into account the comments of all the concerned parties and stakeholders.
7. Any differences between the GACAR Section 4 new amendment and ICAO Annex 4 Standards and Recommended Practices will be forwarded to ICAO as a Difference and published as it is in the Aeronautical Information Publication (AIP).
8. All concerned parties and stakeholders will be provided a copy of the new amendment and will be requested to update their copy of the GACAR Section 4 accordingly.
9. It is the responsibility of all concerned parties to keep their copy of GACAR-Section 4 and other GACA regulation publication up to date.

SUPPLEMENTARY REGULATIONS

From time to time it will be necessary to issue regulations which supplement or augment the GACAR Regulations. The following procedures will apply:

1. Supplementary regulations will be issued in the form of a GACA Regulation Circular (RC).
2. The GACA Regulation Circular will be approved by the President.
3. The process for preparation and publishing of the GACA Regulation Circular will be addressed in the GACA Quality System Manual.

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AMENDMENT RECORD

* This edition incorporates all ICAO amendments to annex 4 up to and including amendment 58

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LIST OF CURRENT DIFFERENCES TO ICAO SARPS

GACA Regulation Section 4 is based on ICAO Annex 4. The following is a list of differences between the GACA Regulation and the ICAO Standards and Recommended Practices (SARPS). Differences have been notified to ICAO and are also published in the KSA Aeronautical Information Publication (AIP-GEN 1.7).

ICAO Annex 4 – Aeronautical Charts – Amendment 56		
SARP Identifier	Regulation Reference	Difference
Annex 4 : Chapter 1	1.1	Air transit route term is not used GACAR Section 11.
Annex 4 : Chapter 1	1.1	RNP type: defined as RNP specification within GACAR Section 11.
Annex 4 : Chapter 1	1.2.2.1	GACA does not conform to only few numbers of recommendations practices.
Annex 4 : Chapter 2	2.1.8	The GACA sheet size of the charts is 210 mm x 297 mm (A4) size.
Annex 4: Chapter 2	2.18.2.2	Geoid undulation is not shown on charts produced by GACA.
Annex 4: Chapter 3	3.9.1	Order of accuracy attained is not shown.
Annex 4: Chapter 4	4.1	GACA does not produce an Aerodrome Obstacle Chart - ICAO type B.
Annex 4: Chapter 5	5.1	GACA does not produce an Aerodrome terrain and obstacle chart - ICAO (electronic)
Annex 4: Chapter 11	11.4	The GACA sheet size of the charts is 210 mm x 297 mm (A4) size.
Annex 4: Chapter 11	11.10.2.5	Heights may be related to THR elevation or Touchdown zone elevation.
Annex 4: Chapter 11	11.10.8.6	The Threshold crossing height (TCH) or the Reference Datum Height (RDH) can be shown.
Annex 4: Chapter 11	11.10.7.2	Only the minimum descent altitude/height (MDA/H) or decision altitude/height (DA/H) are shown.
Annex 4: Chapter 12	12.1	The Visual Approach Chart - ICAO is not produced by GACA.
Annex 4: Chapter 13	13.5	The annual change of magnetic variation is not shown.
Annex 4: Chapter 13	13.6.1	b. Geoid undulations are not shown; b.. Geographical coordinates of geometric centre of touchdown and lift-off area are not shown. k. The boundaries of the air traffic control services are not shown.
Annex 4: Chapter 14	14.5.2	The annual change is not shown.
Annex 4: Chapter 14	14.6	a. Apron elevation to the nearest meter or foot is not shown. g. . Geographical coordinates in degrees, minutes, seconds and hundreds of seconds for appropriate taxiway center line points are not shown. h. The boundaries of the air traffic control services are not shown.
Annex 4: Chapter 15	15.5.2	The annual change of magnetic variation is not shown.
Annex 4: Chapter 15	15.6	a. Apron elevation to the nearest meter or foot is not shown. f. Geographical coordinates in degrees, minutes, seconds and hundreds of seconds for appropriate taxiway center line points are not shown. g. The boundaries of the air traffic control services are not shown.
Annex 4: Chapter 17	17.1	The aeronautical chart - ICAO 1:500 000 is not produced by GACA.
Annex 4: Chapter 18	18.1	The aeronautical navigation chart - ICAO small scale is not produced by GACA.
Annex 4: Chapter 19	19.1	The plotting chart - ICAO is not produced by GACA.
Annex 4: Chapter 20	20.1	The electronic aeronautical chart display - ICAO is not produced by GACA.

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CHAPTER 1 – DEFINITIONS**1.1. Definitions**

When the following terms are used in this regulation, they shall 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; and
- 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 defense 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 taxiway

A defined path on the surface established for the air taxiing of helicopters.

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 path on the surface established for the air transiting of helicopters.

Airway

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

Altitude

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

Application

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

Apron

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

Area minimum altitude (AMA)

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

Area navigation (RNAV)

A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

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 channeling the flow of traffic as necessary for the provision of air traffic services.

ATS surveillance system

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

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.

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).

Data quality

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

Data set

Identifiable collection of data (ISO 19101).

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.

Displaced threshold

A threshold not located at the extremity of a runway.

DEFINITIONS

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).

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 maneuver to hover or landing is completed and from which the take-off maneuver 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

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.

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.

Geoid undulation

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

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).

Height

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

Helipoint reference point (HRP).

The designated location of a helipoint or a landing location.

Helicopter stand

An aircraft stand which provides for parking a helicopter and, where air-taxiing operations are contemplated, the helicopter touchdown and lift-off.

Heliport

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

Holding procedure

A predetermined maneuver, 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 color 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 maneuvers 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.

Maneuvering 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).

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 maneuvering area and the apron(s).

Navigation specification

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

Required Navigation performance (RNP) specification

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

Area navigation (RNAV) specification

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

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.

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”.

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

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

Procedure turn

A maneuver 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

Airspace of defined dimensions, above the land areas or territorial waters of a KSA, 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. 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”.

Resolution

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

Restricted area

Airspace of defined dimensions, above the land areas or territorial waters of a KSA, 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

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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. 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.

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 centered 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

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.

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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 maneuvers 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

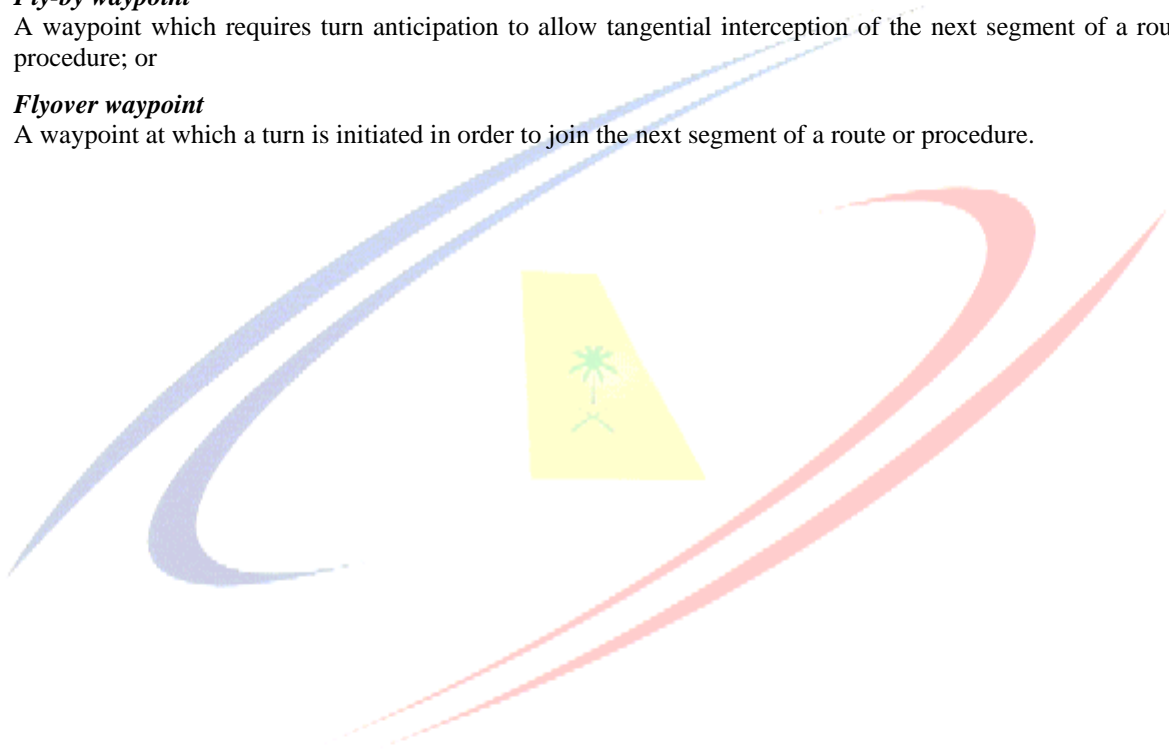
A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:

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.



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1.2 Abbreviations

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

ACC	Area Control Center or Area Control		better than prescribed values or conditions
ACFT	Aircraft		
ACL	Altimeter check location	CBA	Cross Border Area
ACN	Aircraft classification number	CCB	Common Control Boundary
AD	Aerodrome	CM	Centimeter
ADA	Advisory area	CNS	Communications, Navigation, Surveillance
ADF	Automatic direction finding equipment	COM	Communications
ADIZ	Air defense identification zone	COP	Change-over point
ADR	Advisory route	CRC	Cyclic redundancy check
AFIS	Aerodrome flight information service	CTA	Control area
AGA	Aerodromes, air routes and ground aids	CTL	Control
AGL	Above ground level	CTR	Control zone
AIC	Aeronautical information circular	D	Danger area
AIP	Aeronautical information publication	DA	Decision altitude
AIRAC	Aeronautical information regulation and control	D-ATIS	Digital automatic terminal information service
AIS	Aeronautical information services	DEG	Degrees
ALT	Altitude	DH	Decision height
ALTN	Alternate (aerodrome)	DIST	Distance
AMSL	Above mean sea level	DME	Distance measuring equipment
APCH	Approach	DVOR	Doppler VOR
APP	Approach control		
APV	Approach procedure with vertical guidance	E	East or eastern longitude
ARP	Aerodrome reference point	ELEV	Elevation
ASDA	Accelerate-stop distance available	F	
ATC	Air traffic control	FAF	Final approach fix
ATIS	Automatic terminal information service	FAP	Final approach point
ATS	Air traffic services	FIC	Flight information center
ATSP*	Air traffic services procedures	FIR	Flight information region
ATSU*	Air traffic services unit	FIS	Flight information service
ATZ	Aerodrome traffic zone	FL	Flight level
AVASIS	Abbreviated visual approach slope indicator system	FREQ	Frequency
AWY	Airway	FT	Feet
AZM	Azimuth	G	Green
B	Blue	GACA	General Authority of Civil Aviation
BA	Braking action	GACAR	GACA Regulation
BASE	Cloud base	GAT	General air traffic
BCN	Beacon (aeronautical ground light)	GEN	General
BCST	Broadcast	GND	Ground
BDRY	Boundary	GP	Glide path
BKN	Broken	GS	Ground speed
BLDG	Building	H	
BLW	Below	H24	Continuous day and night service
BRG	Bearing	HDG	Heading
BTN	Between	HEL	Helicopter
C	Degrees Celsius	HF	High frequency (3 to 30 MHz)
C/L	Center line	HGT	Height or height above
CAS	Calibrated air speed	HPA	HECTOPASCAL
CAT I-II-III	Associated with an approach type.	Hz	Hertz (cycle per second)
CAVOK	Visibility, cloud and present weather	I	
		IAC	Instrument approach chart
		IAF	Initial approach fix

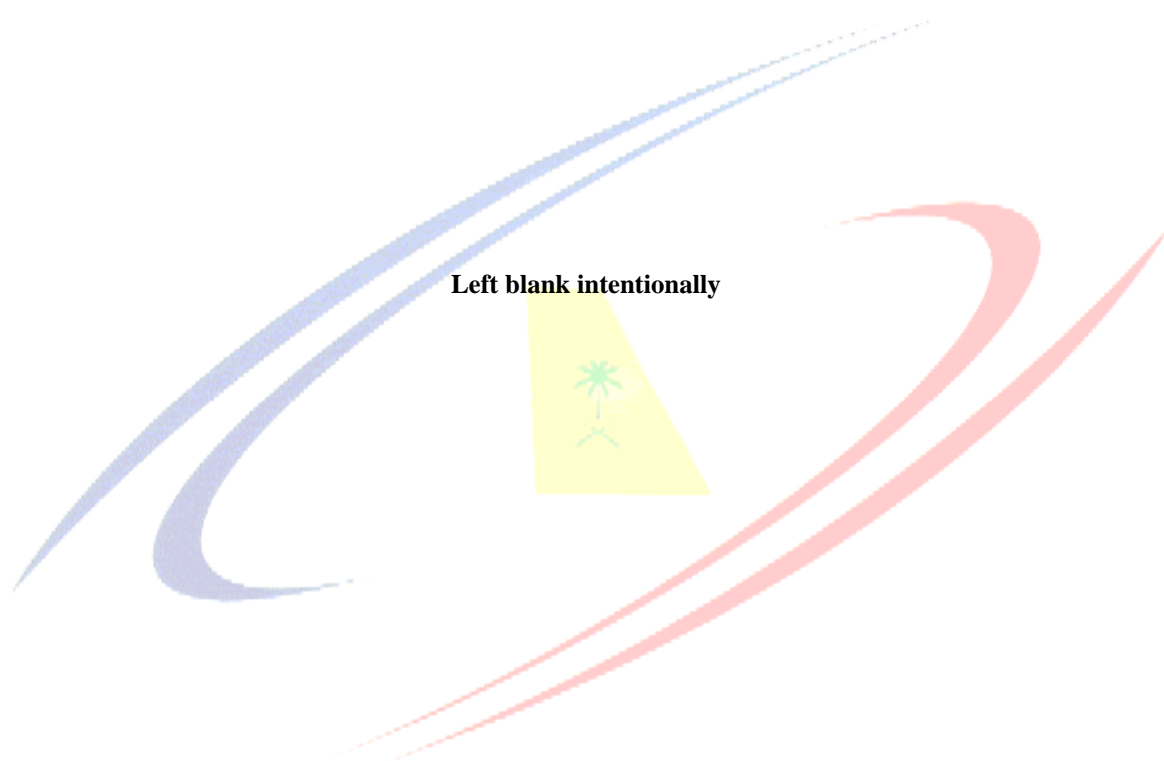
DEFINITIONS

IAP	Instrument approach procedure	NE	North-east
IAS	Indicated air speed	NIL	None
ICAO	International Civil Aviation Organization	NM	Nautical miles
ID	Identifier or identify	NOF	International NOTAM office
IDENT	Identification	NOSIG	No significant change
IF	Intermediate fix	NOTAM	Notice to airmen
IFR	Instrument flight rules	NOZ	Normal operating zone
ILS	Instrument landing system	NPA	Non precision approach
IM	Inner Marker	NTZ	No transgression zone
IMC	Instrument meteorological conditions	NW	North-west
INA	Initial approach	O/R	On request
INFO	Information	OAT	Operational Air Traffic
INS	Inertial navigational system	OCA	Obstacle clearance altitude
INT	Intersection	OCH	Obstacle clearance height
ISA	International standard atmosphere	OM	Outer marker
ISO	International Standards Organization	P	Prohibited
K		PA	Precision approach
Khz	Kilohertz	PANS	Procedures for air navigation services
KM	Kilometers	PAPI	Precision Approach Path Indicator
KSA	Kingdom of Saudi Arabia	PAR	Precision approach radar
KT	Knots	PCN	Pavement classification number
L	Left	PLN	Flight Plan
LAT	Latitude	PSN	Position
LCN	Load classification number	PSR	Primary Surveillance Radar
LDA	Landing distance available	PTN	Procedure turn
LDG	Landing	QFE	Atmospheric pressure at aerodrome elevation (or at runway threshold)
LDI	Landing direction indicator	QNH	Altimeter sub-scale setting to obtain elevation when on the ground
LLZ	Localizer	R	Red, right, restricted area, radar, or RNP certified
LM	Locator, middle	RA	Resolution Advisory
LO	Locator outer	RCC	Rescue Coordination Center
LONG	Longitude	RCF	Radio communication failure
LVL	Level	RCL	Runway center line
M	Meters	RCP	Required communications performance
MAG	Magnetic	RDL	Radial
MAPT	Missed approach point	REP	Reporting point
MDA	Minimum descent altitude	RNAV	Area Navigation
MDH	Minimum descent height	RNP	Required Navigation Performance
MEA	Minimum en-route altitude	ROC	Rate of climb
MET	Meteorological or meteorology	RPI	Radar position indication
METAR	Aviation routine weather report	RPS	Radar position symbol
MHZ	Megahertz	RSR	En-route surveillance radar
MIL	Military	RVR	Runway visual range
MIN	Minutes	RWY	Runway
MKR	Marker radio beacon	S	South or southern latitude
MM	Middle Marker	SARPS	Standards and Recommended Practices
MNM	Minimum	SE	South-east
MOA	Military operating area	S&AT	Safety & Air Transport
MOC	Minimum obstacle clearance	SID	Standard instrument departure
MOR	Meteorological optical range	SMC	Surface movement control
MRP	ATS/MET reporting point	SRA	Surveillance radar approach
MS	Minus	STAR	Standard (instrument) arrival
MSA	Minimum sector altitude	SW	South-west
MSAW	Minimum Safe Altitude Warning	SWY	Stop-way
MSL	Mean sea level		
MVA	Minimum Vectoring Altitude		
N	North		
NAV	Navigation		
NDB	Non-directional radio beacon		

DEFINITIONS

T	Temperature	UTC	Coordinated Universal Time
TA	Transition altitude	V	
TACAN	Tactical air navigation aid	VAC	Visual approach chart
TAR	Terminal area surveillance radar	VAR	Magnetic Variation
TAS	True airspeed	VASIS	Visual approach slope indicator
TDZ	Touchdown zone	system	
TEL	Telephone	V-ATIS	Voice-automatic terminal information service
TFC	Traffic	VER	Vertical
TFR*	Transfer of control	VFR	Visual flight rules
TGS	Taxiing guidance system	VHF	Very high frequency (30 to 300 MHz)
THR	Threshold	VIS	Visibility
TIL	Until	VMC	Visual meteorological conditions
TIBA	Traffic Information Broadcasts by Aircraft	VOR	VHF Omni-directional radio range
TKOF	Take off	VORTAC	VOR and TACAN
TLOF	Touchdown and Liftoff Area	VSM	Vertical separation minimum
TMA	Terminal control area	W	West, western longitude
TODA	Take off distance available	WAC	World aeronautical chart ICAO 1:1,000,000
TORA	Take off run available	WDI	Wind direction indicator
TR	Track	WPT	Way-point
TRA	Radar transfer of control message	WX	Weather
TWR	Aerodrome control TWR or aerodrome control	X	
TWY	Taxiway	XBAR	Crossbar
U/S	Unserviceable	Y	Yellow
UHF	Ultra high frequency (300 to 3,000 MHz)	YCZ	Yellow caution zone
UNL	Unlimited		





CHAPTER 2 - GENERAL

Note:- Unless otherwise stated, within this regulation, ANS refers to the Aeronautical Information Services Department of the Air Navigation Services Division of the General Authority for Civil Aviation (GACA).

2.1 Operational requirements for charts

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

- a. Phase 1 – Taxi from aircraft stand to take-off point
- b. Phase 2 – Take-off and climb to en-route ATS route structure
- c. Phase 3 – En-route ATS route structure
- d. Phase 4 – Descent to approach
- e. Phase 5 – Approach to land and missed approach
- f. Phase 6 – Landing and taxi to aircraft stand.

2.1.2. For each type of chart, ANS shall provide information relevant to the function of the chart and ensure that its design observe Human Factors principles, which facilitate its optimum use.

2.1.3. For each type of chart, ANS shall provide information appropriate to the phase of flight, to ensure the safe and expeditious operation of the aircraft.

2.1.4 The ANS shall ensure that the presentation of information is accurate, free from distortion and clutter, unambiguous, and readable under all normal operating conditions.

2.1.5 The ANS shall ensure that colors or tints and type size used are such that the chart can be easily read and interpreted by the pilot in varying conditions of natural and artificial light.

2.1.6 The ANS shall ensure that the information is in a form, which enables the pilot to acquire it in a reasonable time consistent with workload and operating conditions.

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

2.1.8 The charts shall be True North orientated.

2.1.9 The basic sheet size of the charts shall be 210 x 148 mm (8.27 x 5.82 in) (A5).

2.2 Titles

The title of a chart or chart series prepared in accordance with the specifications contained in this Regulation and intended to satisfy the function of the chart, shall be that of the relevant chapter heading as modified by application of any provision contained therein, except that such title shall not include 'ICAO' unless the chart conforms with all provisions specified in this Chapter and any specified for the particular chart.

2.3 Miscellaneous information

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

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

- 1) designation or title of the chart series -the title may be abbreviated;
- 2) name and reference of the sheet;
- 3) on each margin an indication of the adjoining sheet (when applicable).

2.3.3 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.

2.3.4 The designation of GACA and address 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.

2.4 Symbols

The 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.

2.4.2 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.

2.4.3 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.

2.4.4 GACA-ANS shall ensure that, symbols are shown in the manner specified in 2.4.2, 2.4.3 and Appendix A2.

2.5 Units of measurement

2.5.1 Distances shall be derived as geodesic distances.

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

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

2.5.4 Linear dimensions on aerodromes and short distances shall be expressed in meters.

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

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

2.5.7 Conversion scales (kilometers/nautical miles, meters/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.

2.6 Scale and projection

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

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

2.7 Date of validity of aeronautical information

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

2.8 Spelling of geographical names

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

2.8.2 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.

2.8.3 Where a geographical term such as "point", "gulf", "river", is abbreviated on any particular chart, that word shall be spelt out in full in English. Punctuation marks shall not be used in abbreviations within the body of a chart.

2.8.4 Reserved

2.9 Abbreviations

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

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

2.10 Political boundaries

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

2.10.2 Where the territory of other States appears on a chart, the names identifying the countries shall be indicated.

2.11 Colors

Colors used on charts shall comply with the Color Guide of Appendix A3.

2.12 Relief

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

- a) orientation and identification;
- b) safe terrain clearance;
- c) clarity of aeronautical information when shown;
- d) planning.

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.

2.12.2 Where relief is shown by hypsometric tints, the tints used should be based on those shown in the Hypsometric Tint Guide in Appendix A4.

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

2.12.3.1 The value of spot elevations of doubtful accuracy shall be followed by the sign \pm .

2.13 Prohibited, restricted and danger areas

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

2.14 Air traffic services airspace

2.14.1 When ATS airspace is shown on a chart, the class of airspace, the type, name or call sign, the vertical limits and the radio frequency(ies) to be used shall be indicated and the horizontal limits depicted in accordance with Appendix A2 – ICAO Chart Symbols.

2.14.2 On charts used for visual flight, those parts of the ATS Airspace Classifications table in GACAR – Section 11 applicable to the airspace depicted on the chart shall be on the face or reverse of each chart.

2.15 Magnetic variation

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

2.15.2 When magnetic variation is shown on a chart, the values shown shall be those for the year nearest to the date of publication that is divisible by 5, i.e. 1980, 1985, etc. The date and the annual change may be shown.

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

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

2.16 Typography

2.16.1 Typography of a portion of the terrain, where shown, shall be portrayed in a manner that will comply with the technical specifications of the ICAO Aeronautical Chart Manual (Doc 8697).

2.17 Aeronautical data

2.17.1 The ANS 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 GACAR – Section 15. The execution of such quality management shall be made demonstrable for each function stage, when required. In addition, the ANS 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.

2.17.2 The ANS shall ensure that the order of chart resolution of aeronautical data shall be that as specified for a particular chart and as presented in a tabular form in Appendix A5.

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

- a) for routine data: avoid corruption throughout the processing of the data;
- b) for essential data: assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and
- c) for critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance processes to fully mitigate the effects of faults identified thorough analysis of the overall system architecture as potential data integrity risks.

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

Note 2.— Error producing faults in the entire process may be mitigated by additional data quality assurance techniques as may be required. These could include application tests for critical data (for example, by flight check); the use of security, logic, semantic, comparison, and redundancy checks; digital error detection; and the qualification of human resources and process tools such as hardware and software.

2.17.4 Aeronautical data quality requirements related to the integrity and data classification shall be as provided in Tables 1 to 5 in Appendix A5.

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

2.18 Common reference systems

2.18.1 Horizontal reference system

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

2.18.1.2 Geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in GACAR, Section 11 shall be identified by an asterisk.

2.18.1.3 The order of chart resolution of geographical coordinates shall be that specified for a particular chart series and in accordance with Appendix A5, Table 1.

2.18.2 Vertical reference system

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

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.

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

2.18.2.3 The order of chart resolution of elevation and geoid undulation shall be that specified for a particular chart series and in accordance with Appendix A5, Table 2.

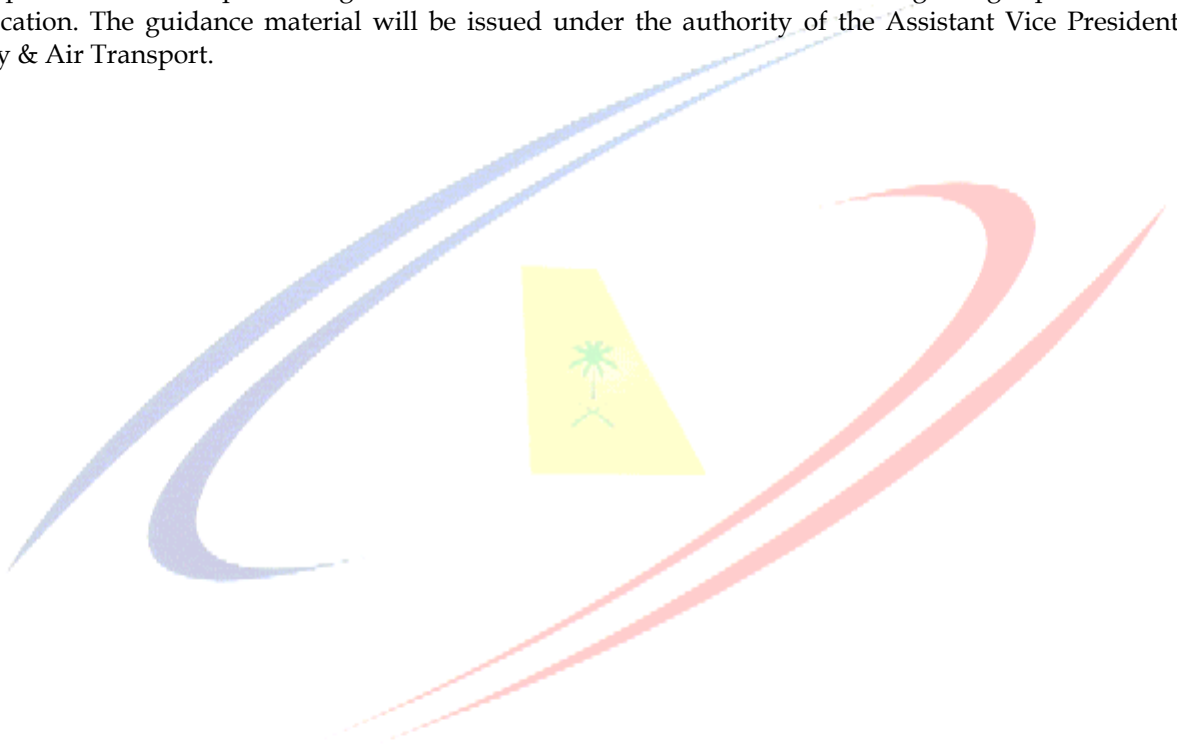
2.18.3 Temporal reference system

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

2.18.3.2 Reserved

2.19 Chart Templates

2.19.1. Top satisfy the need for uniformity and consistency in the provision of aeronautical charts, S&AT shall publish chart templates as guidance material that can be used for charting design, production and publication. The guidance material will be issued under the authority of the Assistant Vice President for Safety & Air Transport.



CHAPTER 3 - AERODROME OBSTACLE CHART — ICAO TYPE A (OPERATING LIMITATIONS)**3.1 Function**

This chart, in combination with the relevant information published in the KSA-AIP, shall provide the data necessary to enable an operator to comply with the relevant operating limitations of GACA regulations.

3.2 Availability

3.2.1 Aerodrome Obstacle Charts — ICAO Type A (Operating Limitations) shall be made available 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.

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

3.3 Units of measurement

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

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

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 end of the runway farthest removed and the elevation are given.

3.4.2 The horizontal scale shall be within the range of 1/10,000 (preferable) to 1/15,000.

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

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

3.4.4 Linear scales. Horizontal and vertical linear scales showing both meters and feet shall be included in the charts.

3.5 Format

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

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

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

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

3.5.4 The chart shall include:

- a) a box for recording the operational data specified in 3.8.3;
- b) a box for recording amendments and dates thereof.

3.6 Identification

The chart shall be identified by “Kingdom of Saudi Arabia”, 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)

3.7 Magnetic variation

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

3.8 Aeronautical data

3.8.1 Obstacles

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

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

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

3.8.2 Take-off flight path area

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

- a) it commences at the end of the area declared suitable for take-off (i.e. at the end of the runway or clearway as appropriate);
- b) its width at the point of origin is 180 m (600 ft) and this width increases at the rate of 0.25D to a maximum of 1 800 m (6,000 ft), where D is the distance from the point of origin;
- c) it extends to the point beyond which no obstacles exist or to a distance of 10.0 km (5.4 NM), whichever is the lesser.

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

3.8.3 Declared distances

3.8.3.1 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.

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

3.8.4 Plan and profile views

3.8.4.1 The plan view shall show:

- a) the outline of the runways by a solid line, including the length and width, the magnetic bearing to the nearest degree, and the runway number;
- b) the outline of the clearways by a broken line, including the length and identification as such;
- c) take-off flight path areas by a dashed line and the centre line by a fine line consisting of short and long dashes;
- d) alternative take-off flight path areas. When alternative take-off flight path areas not centered 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.

3.8.4.2 The profile view shall show:

- a) the profile of the centre line of the runway by a solid line and the profile of the centre line of any associated Stopways and clearways by a broken line;
- b) the elevation of the runway centre line at each end of the runway, at the stopway and at the origin of each take-off flight path area, and at each significant change in slope of runway and stopway;
- c) obstacles, including:
 - 1) each obstacle by a solid vertical line extending from a convenient grid line over at least one other grid line to the elevation of the top of the obstacle;
 - 2) identification of each obstacle;
 - 3) the limits of penetration of obstacles of large extent in a distinctive manner identified in the legend.

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.

3.9 Accuracy

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

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

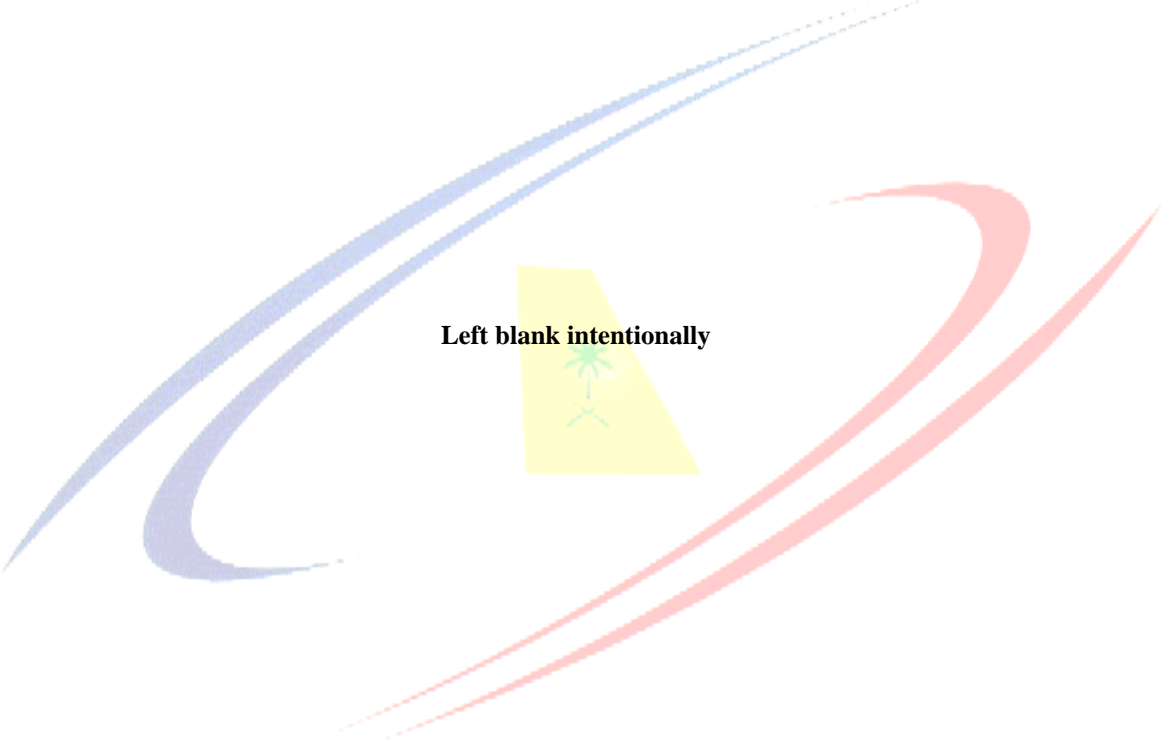
3.9.3 The order of accuracy of the field work and the precision of chart production shall be such that measurements in the take-off flight path areas can be taken from the chart within the following maximum deviations:

- 1) horizontal distances: 5 m (15 ft) at a 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.

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

CHAPTER 4 - RESERVED

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CHAPTER 5 - RESERVED

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CHAPTER 6 - PRECISION APPROACH TERRAIN CHART — ICAO

6.1 Function

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

6.2 Availability

6.2.1 The Precision Approach Terrain Chart — ICAO shall be made available for all precision approach runways Categories II and III at aerodromes used by international civil aviation.

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

6.3 Scale

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

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

6.4 Identification

The chart shall be identified by "Saudi Arabia", the name of the city or town, or area, which the aerodrome serves, the name of the aerodrome and the designator of the runway.

6.5 Plan and profile information

6.5.1 The chart shall include:

- 1) 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;
- 2) an indication where the terrain or any object thereon, within the plan defined in 1) above, differs by ± 3 m (10 ft) in height from the centre line profile and is likely to affect a radio altimeter;
- 3) 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

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

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

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CHAPTER 7 – ENROUTE CHART — ICAO**7.1 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.

7.2 Availability

7.2.1 The En route Chart — ICAO shall be made available in the manner prescribed in 1.3.2 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.)

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

7.3 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.

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

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

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

7.4 Projection

7.4.1 Recommendation.— *A conformal projection on which a straight line approximates a great circle should 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 selected parallels and meridians.

7.5 Identification

Each sheet shall be identified by chart series and number

7.6 Culture and topography

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

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

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

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

7.7 Magnetic variation

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

7.8 Bearings, tracks and radials

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

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

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

7.9 Aeronautical data

7.9.1 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.*

7.9.2 Prohibited, restricted and danger areas

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

7.9.3 Air traffic services system

7.9.3.1 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;
- 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 Annex 11, 2.22);

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

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

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

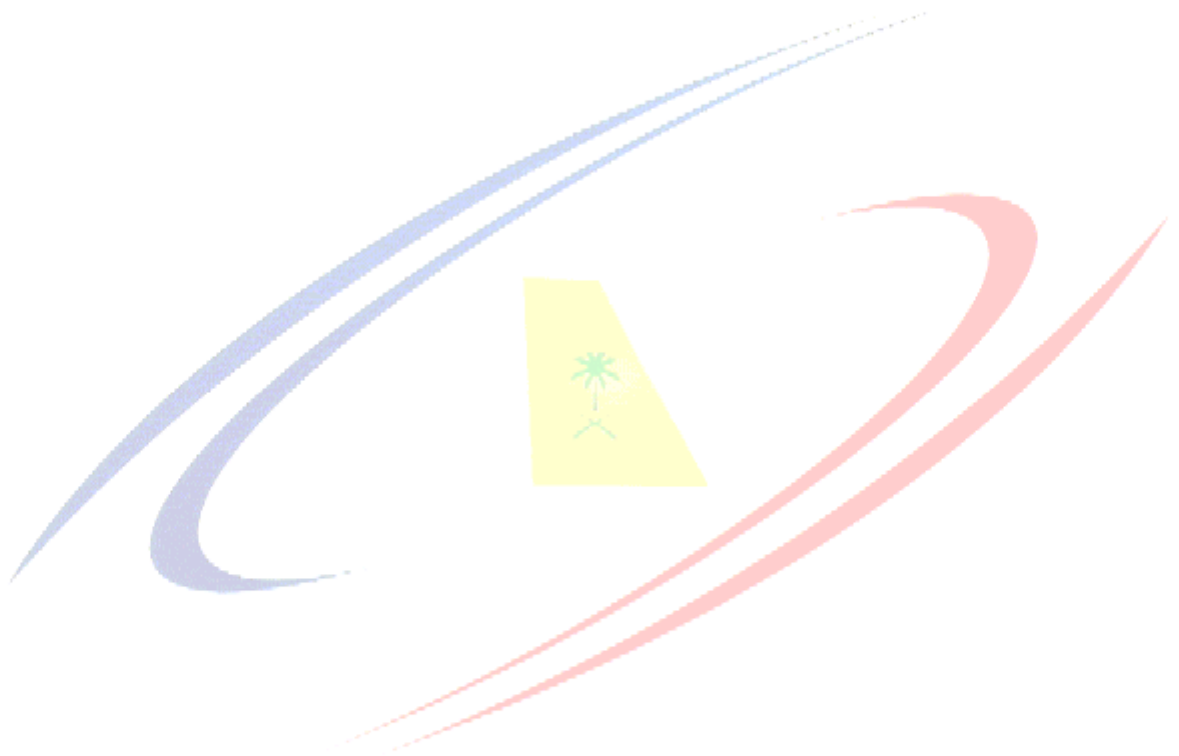
7.9.4 Supplementary information

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

Note 1.— For specifications of these charts, see Chapters 8, 9 and 10.

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.

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



CHAPTER 8 - AREA CHART — ICAO**8.1 Function**

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

- a) the transition between the en-route phase and approach to an aerodrome;
- b) the transition between take-off/missed approach and en- route phase of flight; and
- c) flights through areas of complex ATS routes or airspace structure.

8.2 Availability

8.2.1 The Area Chart — ICAO shall be made available where the air traffic services routes or position reporting requirements are complex and cannot be adequately shown on an En-route Chart — ICAO.

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

8.3 Coverage and scale

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

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

8.4 Projection

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

8.4.2 Parallels and meridians shall be shown at suitable intervals.

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

8.5 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.

8.6 Culture and topography

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

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

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 color, on which half-tone layer tinting is to be based, is specified in Appendix A3 — Color Guide for contours and topographic features.

Note 3.— Appropriate spot elevations and obstacles are those provided by the procedures designer.

8.7 Magnetic variation

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

8.8 Bearings, tracks and radials

8.8.1 Bearings, tracks and radials shall be magnetic-

8.9 Aeronautical data**8.9.1 Aerodromes**

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

8.9.2 Prohibited, restricted and danger areas

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

8.9.3 Area minimum altitudes

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

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

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 include the following:

- 1) 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;
- 2) in respect of DME, additionally the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);
- 3) terminal radio aids which are required for outbound and inbound traffic and for holding patterns;
- 4) the lateral and vertical limits of all designated airspace and the appropriate class of airspace;
- 5) the designation of the navigation specification(s) including any limitations, where established;
- 6) 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;
- 7) 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;
- 8) in respect of waypoints defining VOR/DME area navigation routes, additionally,
 - a) the station identification and radio frequency of the reference VOR/DME;
 - b) the bearing to the nearest tenth of a degree and the distance to the nearest two-tenths of a kilometer (tenth of a nautical mile) from the reference VOR/DME, if the waypoint is not collocated with it;
- 9) an indication of all compulsory and “on-request” reporting points;
- 10) the distances to the nearest kilometer or nautical mile between significant points constituting turning points or reporting points;

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

- 11) change-over points on route segments defined by reference to very high frequency omnidirectional radio ranges, indicating the distances to the nearest kilometer or nautical mile to the radio navigation aids;

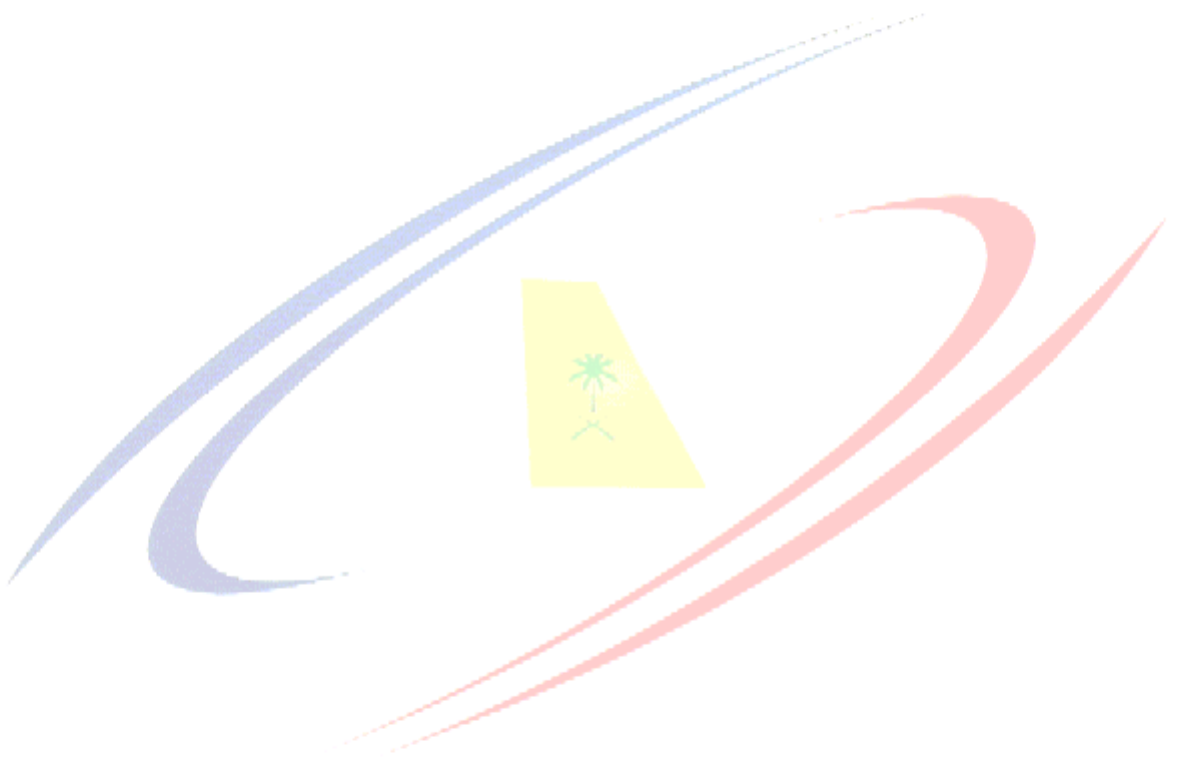
Note.— Change-over points established at midpoint between two aids, or at the intersection of two radials in the case of a route which changes direction between the aids, need not be shown for each route segment if a general statement regarding their existence is made.

- 12) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 meters or 100 feet;
- 13) 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 8.9.4.1.1, 12), need not be duplicated on the Area Chart — ICAO.

- 14) area speed and level/altitude restrictions where established;
- 15) communication facilities listed with their channels and, if applicable, logon address..
- 16) an indication of ‘flyover’ significant points.



CHAPTER 9 - STANDARD DEPARTURE CHART — INSTRUMENT (SID) — ICAO

9.1 Function

This chart shall provide the flight crew with information to enable it to comply with the designated standard departure route — instrument from take-off phase to the en- route phase.

9.2 Availability

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

9.3 Coverage and scale

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

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

9.3.2 The chart should 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 should 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 departure route(s) — instrument as established in accordance with the applicable GACA provisions. The identification of the standard departure route(s) — instrument shall be provided by the procedures designer.

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, should 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 color, on which half-tone layer tinting is to be based, is specified in Appendix A3 — Color Guide for contours and topographic features

Note 3.— Appropriate spot elevations and obstacles are those provided by the procedures designer.

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 RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g. 290° (294.9°T).A note to this effect may be included on the chart.

9.9 Aeronautical data

9.9.1 Aerodromes

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

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

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

9.9.4 Air traffic services system

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

9.9.4.1.1 The components shall comprise the following:

- 1) a graphic portrayal of each standard departure route — instrument, including:
 - a) route designator;
 - b) significant points defining the route;
 - c) magnetic track or radial to the nearest degree along each segment of the route;
 - d) distances to the nearest kilometer or nautical mile between significant points;
 - e) 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 when established;
 - f) 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 21), in which case the elements indicated by 9.9.4.1.1, 1) f), need not be duplicated on the Standard Departure Chart — Instrument (SID) — ICAO.

- 2) the radio navigation aid(s) associated with the route(s) including:
 - a) plain language name;
 - b) identification;
 - c) frequency;
 - d) geographical coordinates in degrees, minutes and seconds;
 - e) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);
- 3) the name-codes of the significant points not marked by the position of a radio navigation aid, their geographical coordinates in degrees, minutes and seconds and the bearing to the nearest tenth of a degree and distance to the nearest two-tenths of a kilometer (tenth of a nautical mile) from the reference radio navigation aid;

- 4) applicable holding patterns;
- 5) applicable transition altitude/height;
- 6) 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.—information on close-in obstacles is provided by the procedures designer.

- 7) area speed restrictions, where established;
- 8) the designation of the navigation specification(s) including any limitations, where established;
- 9) all compulsory and “on-request” reporting points;
- 10) radio communication procedures, including:
 - a) call sign(s) of ATS unit(s);
 - b) frequency;
 - c) transponder setting, where appropriate.
- 11) an indication of ‘flyover’ significant points.

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

9.9.5 Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the applicable requirements on the verso of the chart or as a separate, properly referenced sheet. The Appropriate data shall be provided by the procedures designer.

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

10.1 Function

This chart shall provide the flight crew with information to enable it to comply with the designated standard arrival route — instrument from the en-route phase to the approach phase.

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.

10.2 Availability

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

10.3 Coverage and scale

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

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

10.4 Projection

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

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

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

10.5 Identification

The chart shall be identified by the name of the city or town, or area, which the aerodrome serves, the name of the aerodrome, and the identification of the standard arrival route(s) - instrument as established in accordance with the applicable GACA requirements related to the principles governing identification of standard departure and arrival routes and associated procedures. This designation shall be provided by the procedures designer.

10.6 Culture and topography

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

10.6.2 To improve situational awareness in areas where significant relief exists, the chart shall be drawn to scale and all relief exceeding 300 m (1,000 ft) above the aerodrome elevation shall be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, shall be shown printed in black. Obstacles 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 color, on which half-tone layer tinting is to be based, is specified in Appendix A3 — Color Guide for contours and topographic features.

Note 3.— Appropriate spot elevations and obstacles are those provided by the procedures designer

10.7 Magnetic variation

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

10.8 Bearings, tracks and radials

10.8.1 Bearings, tracks and radials shall be magnetic. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g. 290° (294.9°T). A note to this effect may be included on the chart.

10.8.2 Reserved.

10.8.3 Reserved

10.9 Aeronautical data

10.9.1 Aerodromes

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

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

10.9.2 Prohibited, restricted and danger areas

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

10.9.3 Minimum sector altitude

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

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

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

10.9.4 Air traffic services system

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

10.9.4.1.1 The components shall comprise the following:

- 1) a graphic portrayal of each standard arrival route —instrument, including:
 - a) route designator;
 - b) significant points defining the route
 - c) track or radial to the nearest degree along each segment of the route;
 - d) distances to the nearest kilometer or nautical mile between significant points;
 - e) 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;
 - f) 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 21), in which case the elements indicated by 10.9.4.1.1, 1) f), need not be duplicated on the Standard Arrival Chart — Instrument (STAR) — ICAO.

- 2) the radio navigation aid(s) associated with the route(s) including:
 - a) plain language name;
 - b) identification;
 - c) frequency;
 - d) geographical coordinates in degrees, minutes and seconds;
 - e) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);
- 3) the name-codes of the significant points not marked by the position of a radio navigation aid, their geographical coordinates in degrees, minutes and seconds and the bearing to the nearest tenth of a degree and distance to the nearest two-tenths of a kilometer (tenth of a nautical mile) from the reference radio navigation aid;
- 4) applicable holding patterns;
- 5) transition altitude/height to the nearest higher 300 m or 1,000 ft;
- 6) area speed restrictions, where established;
- 7) the designation of the navigation specification(s) including any limitations, where established;

- 8) all compulsory and “on-request” reporting points;
- 9) radio communication procedures, including:
 - a) call sign(s) of ATS unit(s);
 - b) frequency;
 - c) transponder setting, where appropriate.
- 10) an indication of ‘flyover’ significant waypoints.

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

10.9.5 Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the GACA applicable requirements, on the verso of the chart or as a separate, properly referenced sheet. Appropriate data shall be provided by the procedures designer.



CHAPTER 11 - INSTRUMENT APPROACH CHART — ICAO**11.1 Function**

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

11.2 Availability

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

11.2.2 A separate Instrument Approach Chart — ICAO shall normally be provided for each precision approach procedure.

11.2.3 A separate Instrument Approach Chart — ICAO shall normally be provided for each non-precision approach procedure.

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.

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

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

11.3 Coverage and scale

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

11.3.2 The scale selected shall ensure optimum legibility consistent with:

- 1) the procedure shown on the chart;
- 2) sheet size.

11.3.3 A scale indication shall be given.

11.3.3.1 Except where this is not practicable, a distance circle with a radius of 20 km (10 NM) centered 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.

11.3.3.2 When possible, a distance scale shall be shown directly below the profile.

11.4 Format

The sheet size shall be 210mm x 279 mm.

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, 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 GACA applicable requirements related to the principles governing identification of the instrument approach procedure. This identification is provided by the procedures designer.

11.7 Culture and topography

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

11.7.2 Relief shall be shown in a manner best suited to the particular elevation characteristics of the area. In areas where relief exceeds 1 200 m (4,000 ft) above the aerodrome elevation within the coverage of the chart or 600 m (2,000 ft) within 11 km (6 NM) of the aerodrome reference point or when final approach or missed approach procedure gradient is steeper than optimal due to terrain, all relief exceeding 150 m (500 ft) above the aerodrome elevation shall be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, shall also be shown printed in black.

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 color, on which half-tone layer tinting is to be based, is specified in Appendix A 3 — Color Guide for contours and topographic features.

Note 3.— Appropriate spot elevations are those provided by the procedures designer.

11.7.3 In areas where relief is lower than specified in 11.7.2, all relief exceeding 150 m (500 ft) above the aerodrome elevation should be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, shall 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 color, on which half-tone layer tinting is to be based, is specified in Appendix A3 — Color Guide for contours and topographic features.

Note 3.— Appropriate spot elevations are those provided by the procedures designer.

11.8 Magnetic variation

11.8.1 The magnetic variation shall be shown.

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

11.9 Bearings, tracks and radials

11.9.1 Bearings, tracks and radials shall be magnetic. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g. 290° (294.9°T). A note to this effect may be included on the chart.

11.10 Aeronautical data

11.10.1 Aerodromes

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

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

- 1) the aerodrome on which the procedure is based;
- 2) 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.

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

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

11.10.2 Obstacles

11.10.2.1 Obstacles shall be shown on the plan view of the chart. Appropriate obstacles are those provided by the procedures designer.

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

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

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

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

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

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

11.10.3 Prohibited, restricted and danger areas

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

11.10.4 Radio communication facilities and navigation aids

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

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

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

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

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

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

11.10.5 Minimum sector altitude or terminal arrival altitude

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

11.10.6 Portrayal of procedure tracks

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

- a) the approach procedure track by an arrowed continuous line indicating the direction of flight;
- b) the missed approach procedure track by an arrowed broken line;
- c) any additional procedure track, other than those specified in a) and b), by an arrowed dotted line;
- d) bearings, tracks, radials to the nearest degree and distances to the nearest two-tenths of a kilometer 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 maneuvering (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.

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

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

- a) the aerodrome by a solid block at aerodrome elevation;
- b) the profile of the approach procedure segments by an arrowed continuous line indicating the direction of flight;
- c) the profile of the missed approach procedure segment by an arrowed broken line and a description of the procedure;
- d) the profile of any additional procedure segment, other than those specified in b) and c), by an arrowed dotted line;
- e) bearings, tracks, radials to the nearest degree and distances to the nearest two-tenths of a kilometer or tenth of a nautical mile or times required for the procedure;
- f) altitudes/heights required by the procedures, including transition altitude and, procedure altitudes/heights, and heliport crossing height (HCH) where established;
- g) limiting distance to the nearest kilometer or nautical mile on procedure turn, when specified;
- h) the intermediate approach fix or point, on procedures where no course reversal is authorized;
- i) a line representing the aerodrome elevation or threshold elevation, as appropriate, extended across the width of the chart including a distance scale with its origin at the runway threshold.

Note.— Refer to GACAR – Section 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

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

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

- a) a ground profile shown by a solid line depicting the highest elevations of the relief occurring within the primary area of the final approach segment. The highest elevations of the relief occurring in the secondary areas of the final approach segment shown by a dashed line; or
- b) minimum altitudes/heights in the intermediate and final approach segments indicated within bounded shaded blocks.

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

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

11.10.7 Aerodrome operating minima

11.10.7.1 Aerodrome operating minima when established shall be shown.

11.10.7.2 The obstacle clearance altitudes/heights for the aircraft categories for which the procedure is designed shall be shown; for precision approach procedures, additional OCA/H for Cat D_L aircraft (wing span between 65 m and 80 m and/or vertical distance between the flight path of the wheels and the glide path antenna between 5 m and 8 m) shall be published, when necessary.

11.10.8 Supplementary information

11.10.8.1 When the missed approach point is defined by:

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

the distance to the nearest two-tenths of a kilometer 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.

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

11.10.8.3 For procedures in which DME is not required for use in the final approach segment but where a suitably

located DME is available to provide advisory descent profile information, a table showing the altitudes/ heights shall be included.

11.10.8.4 A rate of descent table shall be shown.

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

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

11.10.8.7 When a final approach fix is specified at the final approach point for ILS, a clear indication shall be given whether it applies to the ILS, the associated ILS localizer only procedure, or both.

11.10.8.8 If the final approach descent gradient/angle for any type of instrument approach procedure exceeds the maximum value specified in the GACA applicable requirements a cautionary note shall be included.

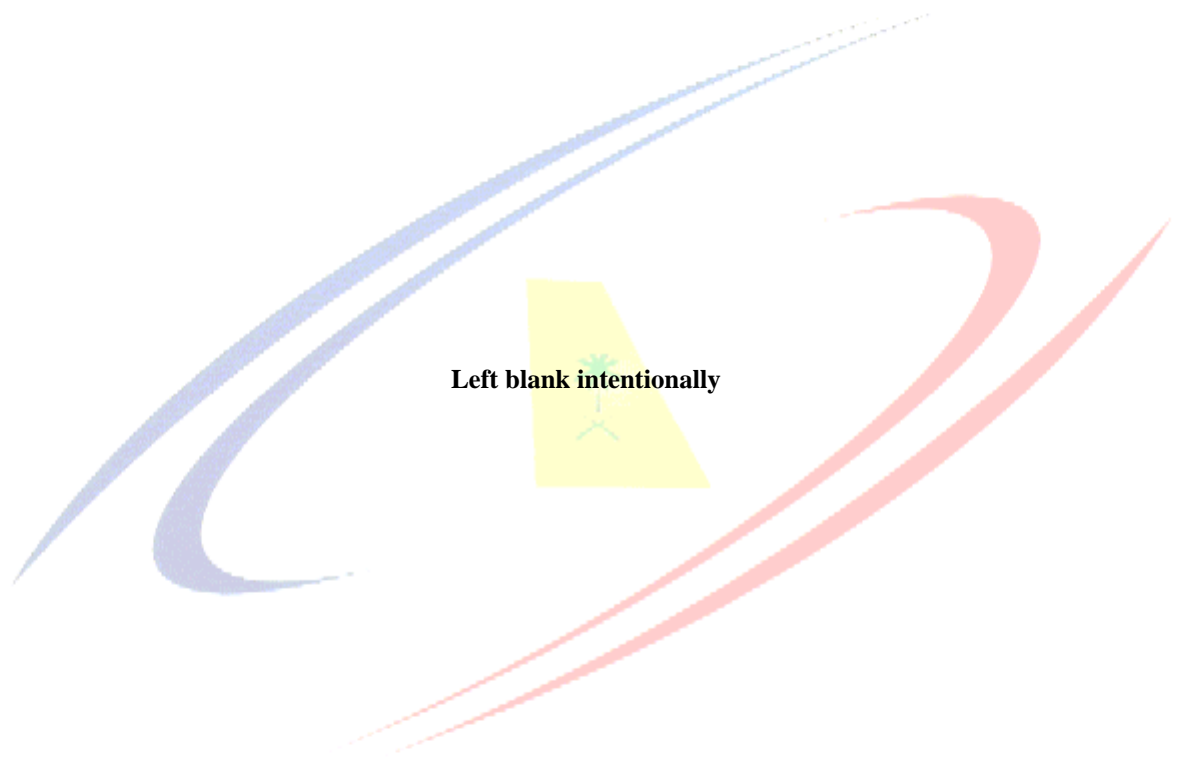
11.10.8.9 All the supplementary information shall be provided by the procedure designer.

11.10.9 Aeronautical database requirements

Appropriate data to support navigation database coding shall be published in accordance with the GACA applicable requirements.



CHAPTER 12 - RESERVED



CHAPTER 13 - AERODROME/HELIPORT CHART — ICAO**13.1 Function**

13.1.1 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;

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

- 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;

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

13.2 Availability

13.2.1 The Aerodrome/Heliport Chart — ICAO shall be made available for all aerodromes/heliports regularly used by international civil aviation.

13.2.2 The Aerodrome/Heliport Chart — ICAO shall be made available also for all other aerodromes/heliports available for use by international civil aviation.

13.3 Coverage and scale

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

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/heliport serves and the name of the aerodrome/heliport.

13.5 Magnetic variation

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

13.6 Aerodrome/heliport data

13.6.1 This chart shall show:

- a) geographical coordinates in degrees, minutes and seconds for the aerodrome/heliport reference point;
- b) elevations, to the nearest meter 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- meter 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 and non-precision approach runway;
- d) all runways including those under construction with designation number, length and width to the nearest meter, 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;

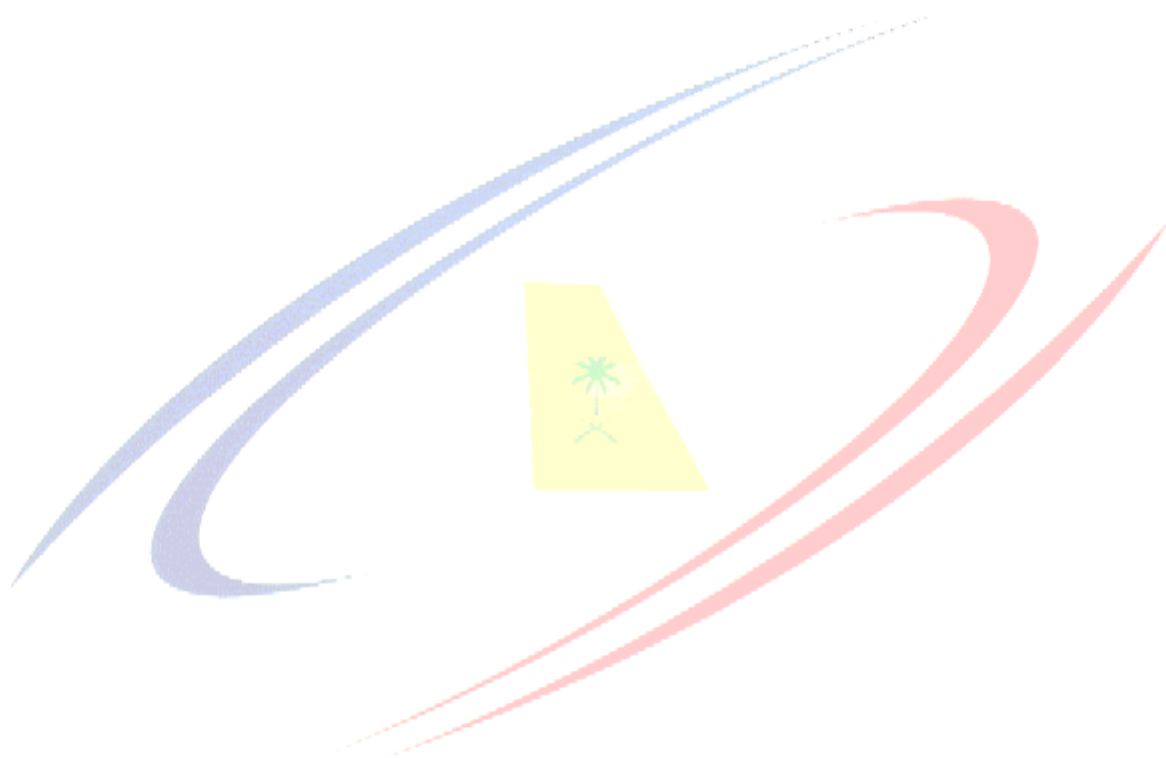
Note.— Additional information regarding hot spots may be shown in tabular form on the face or verso of the chart.

- 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;
- 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.

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

- a) heliport type;
- b) touchdown and lift-off area including dimensions to the nearest meter, 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 meter, 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) meter 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 meter for heliports, where relevant, including:
 - 1) take-off distance available;
 - 2) rejected take-off distance available;
 - 3) landing distance available

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CHAPTER 14 - AERODROME GROUND MOVEMENT CHART — ICAO

14.1 Function

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

14.2 Availability

The Aerodrome Ground Movement Chart — ICAO shall be made available 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.

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 should 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.

14.6 Aerodrome data

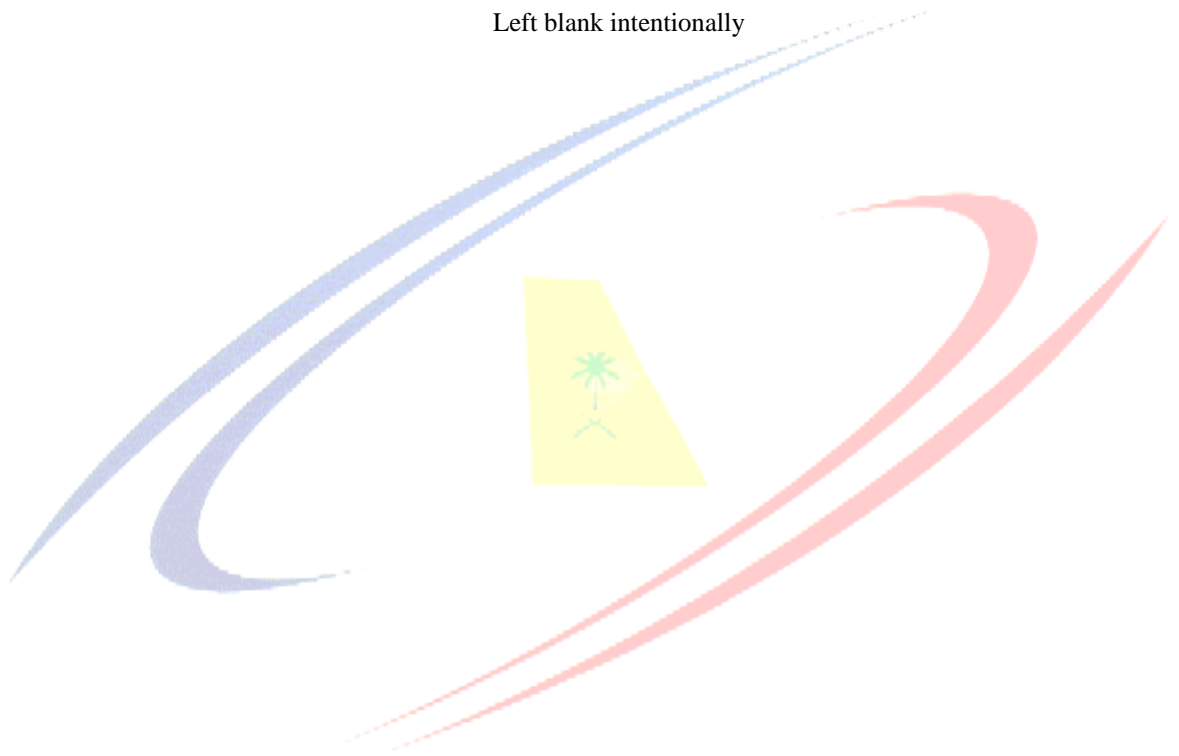
This chart shall show in a similar manner all the information on the Aerodrome/Heliport Chart — ICAO relevant to the area depicted, including:

- a) apron elevation to the nearest meter 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 meter, 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.

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CHAPTER 15 - AIRCRAFT PARKING/DOCKING CHART — ICAO

15.1 Function

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

15.2 Availability

The Aircraft Parking/ Docking Chart— ICAO shall be made available 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.

15.3 Coverage and scale

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

15.3.2 A linear scale shall be shown.

15.4 Identification

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

15.5 Magnetic variation

15.5.1 A True North arrow shall be shown.

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

15.6 Aerodrome data

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

- a) apron elevation to the nearest meter 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.

CHAPTER 16 - WORLD AERONAUTICAL CHART – ICAO 1:1 000 000

16.1 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.

16.2 Availability

16.2.1 The World Aeronautical Chart — ICAO 1:1 000 000 shall be made available in the manner prescribed in 1.3.2 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.

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

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 **Recommendation.**— *The length of the linear scales should represent at least 200 km (110 NM).*

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

16.4 Format

16.4.1 **Recommendation.**— *The title and marginal notes should 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.

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

16.4.3 **Recommendation.**— *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 **Recommendation.**— *Whenever practicable, the sheet lines should 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.

16.4.5 **Recommendation.**— *Overlaps should be provided by extending the chart area on the top and right side beyond the area given on the index. This overlap area should contain all aeronautical, topographical,*

hydrographical and cultural information. The overlap should extend up to 28 km (15 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 The projections shall be as follows:

- a) between the Equator and 80° latitude: the Lambert conformal conic projection, in separate bands for each tier of charts. The standard parallels for each 4° band shall be 40' south of the northern parallel and 40' north of the southern parallel;
- b) between 80° and 90° latitude: the Polar stereographic projection with scale matching that of the Lambert conformal conic projection at latitude 80°, except that in the northern hemisphere the Lambert conformal conic projection may be used between 80° and 84° latitude and the Polar stereographic projection between 84° and 90° with the scales matching at 84° North.

16.5.2 Graticules and graduations shall be shown as follows:

a) Parallels:

<i>Latitude</i>	<i>Distance between parallels</i>	<i>Graduations on parallels</i>
0° to 72°	30'	1'
72° to 84°	30'	5'
84° to 89°	30'	1°
89° to 90°	30'	5°
(Only on degree parallels from 72° to 89°)		

b) Meridians:

<i>Latitude</i>	<i>Interval between meridians</i>	<i>Graduations on meridians</i>
0° to 52°	30'	1'
52° to 72°	30'	1'
(Only on even numbered meridians)		
72° to 84°	1°	1'
84° to 89°	5°	1'
89° to 90°	15°	1'
(Only on every fourth meridian)		

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

16.5.3.1 Recommendation - *The length of the graduation marks should 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.*

16.5.4 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 are numbered within the body of the chart.

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

16.6 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.

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 **Recommendation.**— *Cities and towns of sufficient size should 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 where space permits.*

16.7.2.2 **Recommendation.**— *Important tunnels should be shown.*

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

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.

16.7.3.2 **Recommendation.**— *Roads should 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

Recommendation.— *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, should 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.

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 **Recommendation.**— *The tint covering large open water areas should 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 **Recommendation.**— *Reefs and shoals, including rocky ledges, tidal flats, isolated rocks, sand, gravel, stone and all similar areas, should be shown by symbols when of significant landmark value.*

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 special value to the aviator 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 **Recommendation.**— *The spot elevation of the highest point in any sheet should 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 Reserved

16.7.12 Wooded areas.

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

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 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).

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

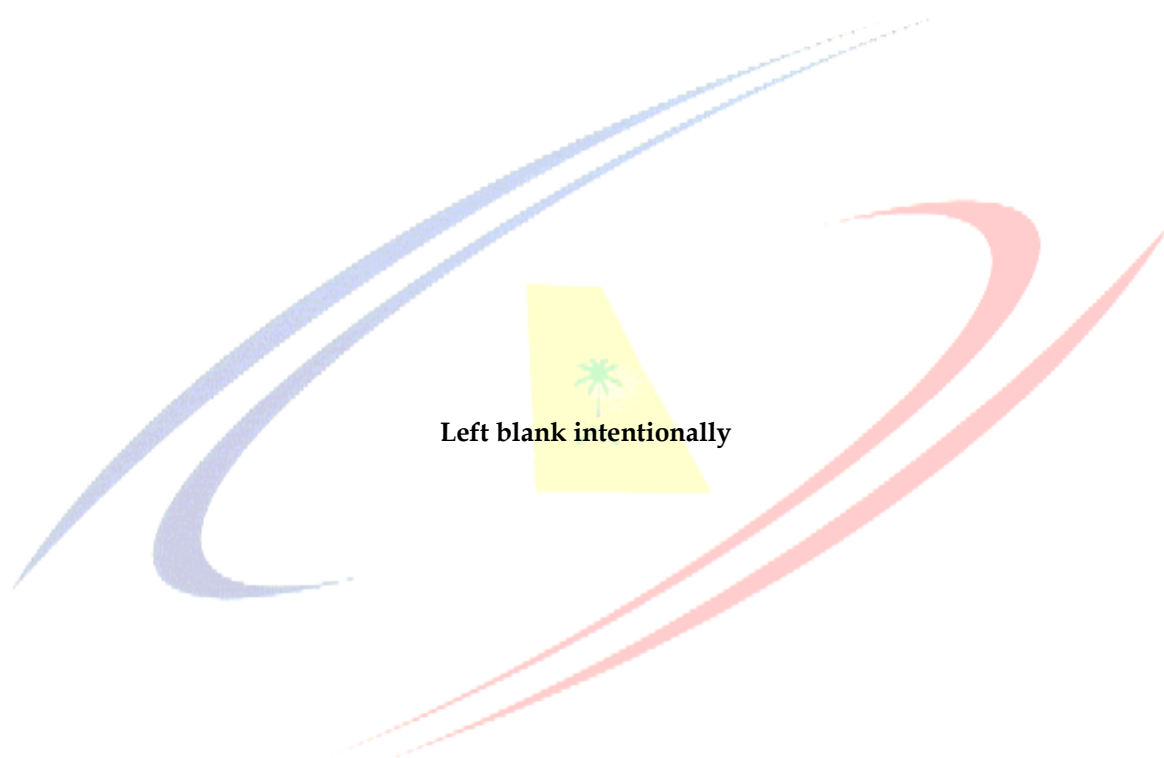
16.9.7.1 Aeronautical ground lights together with their characteristics or their identifications or both shall be shown.

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.

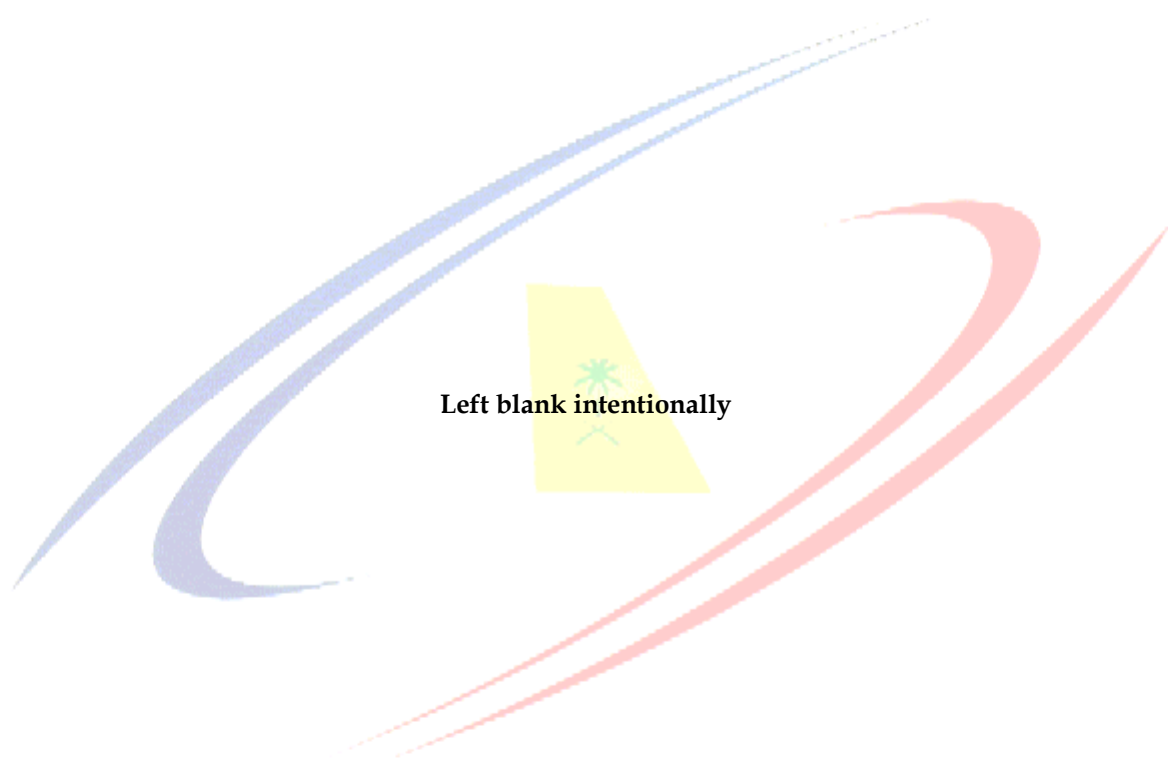


CHAPTER 17 – RESERVED



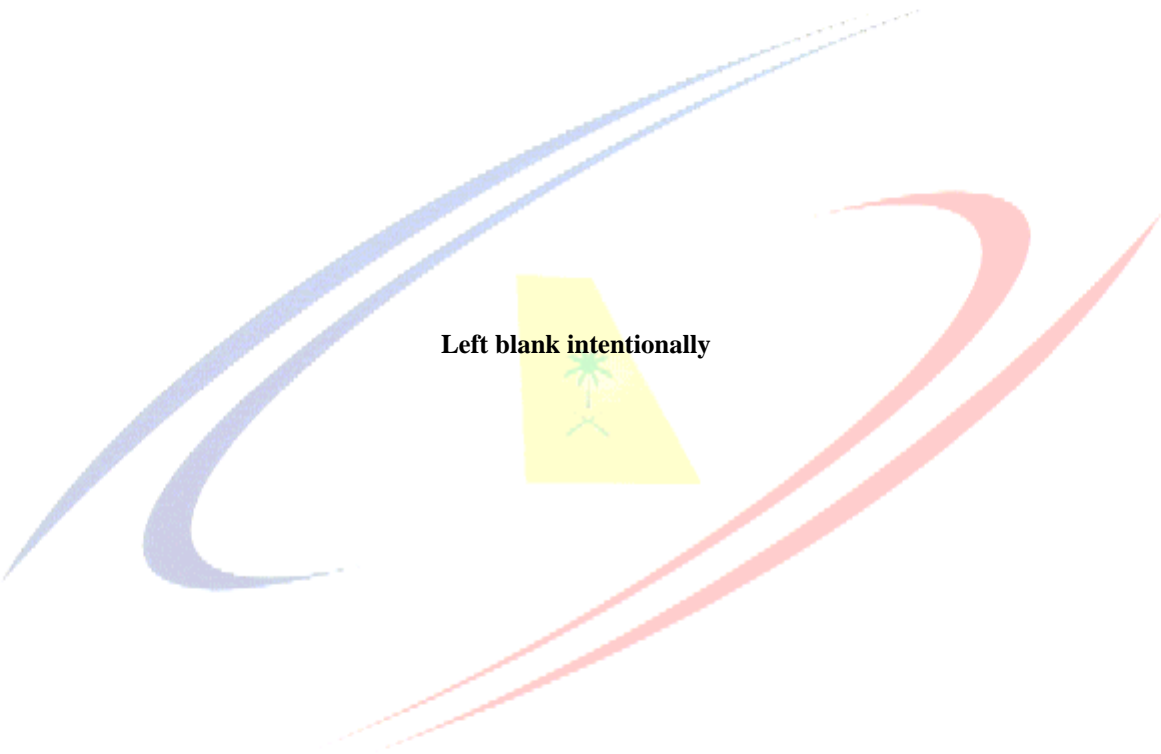
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CHAPTER 20 - RESERVED

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CHAPTER 21 - ATC SURVEILLANCE MINIMUM ALTITUDE CHART — ICAO

21.1 Function

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

Note.— The objectives of the air traffic control service as prescribed in GACAR – Section 11 do not include prevention of collision with terrain. The provisions prescribed in this regulation do not relieve pilots of their responsibility to ensure that any clearances issued by air traffic control units are safe in this respect.

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

21.2 Availability

The ATC Surveillance Minimum Altitude Chart — ICAO shall be made available, 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.

21.3 Coverage and scale

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

21.3.2 The chart shall be drawn to scale.

21.3.3 The chart may be drawn to the same scale as the associated Area Chart — ICAO.

21.4 Projection

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

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

21.5 Identification

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

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.

21.6 Culture and topography

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

21.6.2 Appropriate spot elevations and obstacles shall be shown.

Note.— Appropriate spot elevations and obstacles are those provided by the procedures designer.

21.7 Magnetic variation

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

21.8 Bearings, tracks and radials

21.8.1 Bearings, tracks and radials shall be magnetic.

21.8.2 Reserved.

21.8.3 Reserved

21.9 Aeronautical data

21.9.1 Aerodromes

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

21.9.1.2 The elevation of the primary aerodrome to the nearest meter or foot shall be shown.

21.9.2 Prohibited, restricted and danger areas

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

21.9.3 Air traffic services system

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

- 1) relevant radio navigation aids together with their identifications;
- 2) lateral limits of relevant designated airspace;
- 3) 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.

- 4) transition altitude, where established;
- 5) information associated with vectoring including:

- a) minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;
- b) 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.

- c) 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 centered on the identified aerodrome main VOR radio navigation aid or, if not available, on the aerodrome/heliport reference point;
- d) notes concerning correction for low temperature effect, as applicable;
- 6) communications procedures including call sign(s) and channel(s) of the ATC unit(s) concerned.

21.9.3.2 A textual description of relevant communication failure procedures shall be provided and shall be shown on the chart or on the same page that contains the chart

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APPENDIX A1 - MARGINAL NOTE LAYOUT

TYPE OF THE CHART

TITLE OF THE CHART

The unit of measurement
and magnetic variation

Minimum sector altitude
if required

Scale if possible

GENERAL AUTHORITY OF CIVIL AVIATION

Amendment Number

APPENDIX A2 – CHART SYMBOLS

1. TOPOGRAPHY

1	Contours	
2	Approximate contours	
3	Relief shown by hachure	
4	Bluff, cliff or escarpment	
5	Lava flow	
6	Sand dunes	
7	Sand area	
8	Gravel	
9	Levee or esker	
10	Unusual land features appropriately labeled Active volcano	

11	Mountain pass	
12	Highest elevation on chart	.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	





2. HYDROGRAPHY

19	Shore line (reliable)	
20	Shore line (unreliable)	
21	Tidal flats	
22	Coral reefs and ledges	
23	Large river (perennial)	
24	Small river (perennial)	
25	Rivers and streams (non-perennial)	
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)	
33	Salt lake	
34	Salt pans (evaporator)	



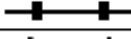

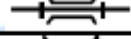
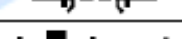
35	Swamp	
36	Rice field	
37	Spring, well or water hole	Perennial Intermittent
38	Reservoir	
39	Dry lake bed	
40	Wash	
41	Shoals	
42	Glaciers and ice caps	
43	Danger line (2 m or one fathom line)	
44	Charted isolated rock	
45	Rock awash	
46	Unusual water features appropriately labeled	

3. CULTURE







BUILT-UP AREAS

47	City or large town	
48	Town	
49	Village	
50	Buildings	



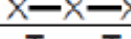


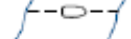
RAIL ROADS

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
















HIGHWAYS AND ROADS

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

MISCELLANEOUS

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

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	

4. AERODROMES

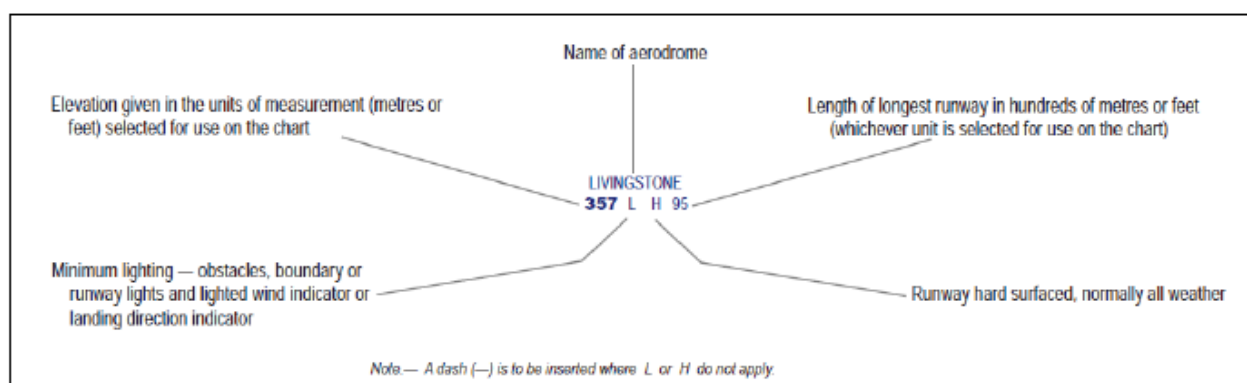
84	Land	Civil	
85	Water	Civil	
86	Military	Land	
87	Military	Water	
88	Joint civil and military	Land	
89	Joint civil and military	Water	
90	Emergency aerodrome or aerodrome with no facilities		
91	Abandoned or closed aerodrome		
92	Sheltered anchorage		
93	Aerodrome for use on charts on which aerodrome 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:		

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	

96

AERODROME DATA IN ABBREVIATED FORM WHICH MAY BE IN ASSOCIATION WITH AERODROMES SYMBOL



5. Radio Navigation Aids

99	Basic radio navigation aid symbol may be used for LLZ Note.— This symbol may be used with or without a box to enclose the data.		
100	Non-directional radio beacon NDB		electronic
101	VHF omnidirectional radio range VOR		
102	Distance-measuring equipment DME may be used for collocated GP with DME		
103	Collocated VOR and DME radio navigation aids VOR/DME		
104	DME distance	Distance in kilometres (nautical miles) to DME Identification of radio navigation aid	15 Km 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	
		FRONT COURSE	
		BACK COURSE	
		PROFILE	
109	Radio-marker beacon Note.— Marker beacon may be shown by outline, or stipple, or both.	GLIDE PATH	
		Elliptical	
		Bone shape	

110	Compass rose To be orientated on the chart in accordance with the alignment of the station (normally Magnetic North)		Compass rose to be used as appropriate in combination with the following symbols:	<table><tr><td>VOR</td><td></td></tr><tr><td>VOR/DME</td><td></td></tr><tr><td>TACAN</td><td></td></tr><tr><td>VORTAC</td><td></td></tr></table>	VOR		VOR/DME		TACAN		VORTAC	
	VOR											
	VOR/DME											
	TACAN											
	VORTAC											
<i>Note.— Additional points of compass may be added as required.</i>												

6. AIR TRAFFIC SERVICES

111	Flight information region FIR	
112	Aerodrome traffic zone ATZ	
113	Control area CTA Airway AWY Controlled route	
114	Uncontrolled route	
115	Advisory airspace ADA	
116	Control zone CTR	
117	Air-defence identification zone ADIZ	
118	Advisory route ADR	
119	Visual flight path	<div>Compulsory with radio communication requirement </div> <div>Compulsory without radio communication requirement </div> <div>recommended </div>

120	Scale-break (on ATS route)	
121	Reporting point REP	<div>Compulsory </div> <div>On request </div>
122	Change-over point COP To be superimposed on the appropriate route symbol at right angles to the route	
123	ATS/MET reporting point	<div>Compulsory </div> <div>On request </div>
124	Waypoint WPT	<div>Flyover WPT (also used for start point and end point of a controlled turn) </div> <div>Fly-by WPT </div>
125	Final approach fix FAF	

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

AIRSPACE CLASSIFICATIONS

127	Airspace classifications	
128	Aeronautical data in abbreviated form to be used in association with airspace classification symbols:	
129	Restricted airspace (prohibited, restricted or danger area)	
130	International boundary closed to passage of aircraft except through air corridor	

AIRSPACE RESTRICTIONS

129	Restricted airspace (prohibited, restricted or danger area)	
	Common boundary of two areas	
	<i>Note. - The angle and density of rulings may be varied according to scale and the size, shape and orientation of the area.</i>	
130	International boundary closed to passage of aircraft except through air corridor	


OBSTACLES




131	Obstacle	
132	Lighted obstacle	
133	Group obstacles	
134	Lighted group obstacles	
135	Exceptionally high obstacle (optional symbol)	
136	Exceptionally high obstacle - lighted (optional symbol)	
137		

MISCELLANEOUS



138	Prominent transmission line	
139	Isogonic or isogonal	
140	Ocean station vessel (normal position)	

VISUAL AIDS

141	Marine light Note 2 - Characteristics are to be indicated as follows:		Note 1 - Marine alternating lights are red and white unless otherwise indicated. Marine lights are white unless colours are stated.					
			Alt Alternating B Blue F Fixed	Fl Flashing G Green Gp Group	Occ Occulting R Red SEC Sector	sec Second (U) Unswitched W White		

142	Aeronautical ground light		Electronic	
143	Lightship			

ADDITIONAL SYMBOLS FOR AIR TRAFFIC SERVICES

144	ATS route reporting point bypass (No report is required on this route)	
145	<p>AMA</p> <p>Area minimum altitude (AMA)</p> <p>It is represented in thousands and tens of feet above mean sea level.</p> <p>Example : 4300 feet 43</p>	

ATS ROUTES	
146	<p>ATS route</p> <p>Route designator ----- V31</p> <p>Magnetic track ----- 090° ----- 270°</p> <p>Distance in nautical miles ----- FL150</p> <p>Minimum enroute altitude ----- 11200</p> <p>Minimum obstacle clearance -----</p>
	<p>Route designator ----- B544</p> <p>Magnetic track ----- 140° ----- 320°</p> <p>Distance in nautical miles ----- 108</p> <p>Minimum enroute altitude ----- FL150</p> <p>Minimum obstacle clearance ----- 11200</p>
	<p>Area navigation route (RNAV)</p> <p>Route designator ----- R775(5)</p> <p>Magnetic track ----- 126° ----- 381 ----- 306°</p> <p>Distance in nautical miles ----- FL195</p> <p>Vertical limits -----</p>
	NOTE: Upper limit FL460

7. SYMBOL FOR AERODROME/HELIPORT CHART

147	Hard surface runway	
148	Pierced steel plank or steel mesh runway	
149	Unpaved runway	
150	Stopway SWY	
151	Taxiways and parking areas	
152	Helicopter alighting area on an aerodrome	
153	Aerodrome reference point	
154	VOR check-point	
155	Runway visual range (RVR) observation site	

156	Point light	
157	Obstacle light	
158	Landing direction indicator (lighted)	
159	Landing direction indicator (unlighted)	
160	Stop bar	
161	Runway -holding Position	<div>Pattern A</div> <div>Pattern B</div>
162	Intermediate holding position	
163	Hot spot <i>Note. - Hot spot location to be circled</i>	

ADDITIONAL SYMBOL FOR AERODROME/HELIPORT CHART, AIRCRAFT PARKING/DOKING CHART AND GROUND MVT CHART

164	Simple Approach Lighting, System (spacing not to scale)	
165	Precision Approach lighting System (spacing not to scale)	
166	PAPI	
167	VASIS	
168	Clearway	
169	Displaced THR	

8. SYMBOL FOR AERODROME OBSTACLE CHARTS TYPE A; B AND C

		Plan	Profile
170	Tree or shrub		
171	Pole, tower, spire, antenna, etc.		
172	Building or large structure		
173	Railroad		
174	Transmission line or overhead cable		

		Plan	Profile
175	Terrain penetrating obstacle plane		
176	Escarpment		
177	Stopway SWY		
178	Clearway CWY		

ADDITIONAL SYMBOLS FOR USE ON PAPER AND ELECTRONIC CHART









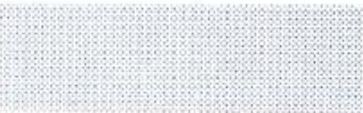



Plan View

179	Minimum sector altitude MSA Note.— This symbol may be modified to reflect particular sector shapes.	
180	Terminal arrival altitude TAA Note.— This symbol may be modified to reflect particular TAA shapes.	
181	True North and magnetic variation	
182	Holding pattern	
183	Missed approach track	
184	Missed approach holding	
185	Initial Approach Fix (IAF)	




PROFILE

186	Runway	
187	Radio navigation aid (type of aid and its use in the procedure to be annotated on top of the symbol)	
188	Radio marker beacon (type of beacon to be annotated on top of the symbol)	
189	Collocated radio navigation aid and marker beacon (type of aid to be annotated on top of the symbol)	
190	DME fix (distance from DME and the fix use in the procedure to be annotated on top of the symbol)	
191	Collocated DME fix and marker beacon (distance from DME and the type of beacon to be annotated on top of the symbol)	

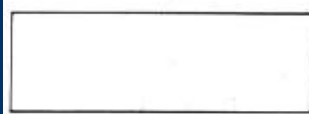












APPENDIX A3 – COLOUR GUIDE

Culture, except highways and roads; outlines of large cities, grids and graticules; spot elevations; danger lines and off-shore rocks; names and lettering except for aeronautical and hydrographic features		BLACK	
Built-up areas of cities		BLACK Stipple	
Highways and roads	Optional colours	BLACK Half-tone	
		RED	
Built-up areas for cities (alternative to black stipple)		YELLOW	
Contours and topographic features: Items 1 through 10 of Appendix 2. Hydrographic features: Items 39 through 41 of Appendix 2		BROWN	
Shore lines, drainage, rivers, lakes, bathymetric contours and other hydrographic features including their names or description		BLUE	
Open water areas		BLUE Half-tone	
Salt lakes and salt pans		BLUE Stipple	
Large non-perennial rivers and non-perennial lakes		BLUE Stipple	
Aeronautical data, except for Enroute and Area Charts - ICAO, where different colours may be required. Both colours may be used on the same sheet but, where only one colour is used, dark blue is preferred	Optional colours	MAGENTA	
		DARK BLUE	

APPENDIX A4 - HYPSONOMETRIC TINT GUIDE

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

HYSOMETRIC TINTS

	WHITE	Tint for extreme elevation	Optional colours	SEPIA	
	VIOLET				
	ORANGE or BUFF	Tint for higher range elevations		BROWN	
	YELLOW	Tint for middle range elevations		BUFF	
	GREEN	Tint for lower range elevations	Optional colours	GREEN	
				WHITE	
	BLUE GREEN	Tint for areas below sea level	Optional colours	BLUE-GREEN	
				LIGHT GREY	

Note. — Basic tints are identical to those specified for the International Map of the World

Table 1. Latitude and Longitude

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

Note. – Refer to GACAR – Section 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Table 2. Elevation/altitude/height

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

Note.— Refer to GACAR – Section 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Table 3. Gradients and angles

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

Table 4. Magnetic variation

Magnetic variation	Chart resolution	Integrity Classification
Aerodrome/airport magnetic variation	1 Degree	essential

Table 5. Bearing

Bearing	Chart resolution	Integrity Classification
Airway segments	1 degree	routine
used for the formation of an en route and of a terminal fix	1/10 degree	routine
Terminal arrival/departure route segments	1 degree	routine
Bearing used for the formation of an instrument approach procedure fix	1/10 degree	essential
ILS localizer alignment	1 degree	essential
MLS zero azimuth alignment	1 degree	essential
Runway and FATO bearing	1 degree	routine

Table 6. Length/distance/dimension

Length/distance/dimension	Chart resolution	Integrity Classification
Airway segment length	1 km or 1 NM	routine
Distance used for the formation of an en-route fix	2/10 km (1/10 NM)	routine
Terminal arrival/departure route segment length	1 km or 1 NM	essential
Distance used for the formation of a terminal and instrument approach procedure fix	2/10 km (1/10 NM)	essential
Runway and FATO length, TLOF dimensions .	1 m	critical
Runway width .	1 m	essential
Stop way length and width	1 m	critical
Landing distance available .	1 m	critical
Take-off run available	1 m	critical
Take-off distance available	1 m	critical
Accelerate-stop distance available	1 m	critical
ILS localizer antenna-runway end, distance	as plotted	routine
ILS glide slope antenna-threshold, Distance along centre line	as plotted	routine
ILS marker-threshold distance	2/10 km (1/10 NM)	essential
ILS DME antenna-threshold, Distance along centre line	as plotted	essential
MLS azimuth antenna-runway end, distance	as plotted	routine
MLS elevation antenna-threshold, Distance along centre line	as plotted	routine
MLS DME/P antenna-threshold, Distance along centre line	as plotted	essential