

COVER SHEET TO AMENDMENT 59

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERONAUTICAL CHARTS

**ANNEX 4
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

ELEVENTH EDITION — JULY 2009

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Checklist of Amendments to Annex 4

	<i>Effective date</i>	<i>Date of applicability</i>
Eleventh Edition (incorporates Amendments 1 to 55)	20 July 2009	19 November 2009; 18 November 2010
Amendment 56 (adopted by the Council on 24 February 2010)	12 July 2010	18 November 2010; 12 November 2015
Amendment 57 (adopted by the Council on 27 February 2013)	15 July 2013	14 November 2013
Amendment 58 (adopted by the Council on 3 March 2014)	14 July 2014	13 November 2014
Amendment 59 (adopted by the Council on 22 February 2016) Replacement pages (xvii), 7-2, 7-3, 8-3, 8-4, 9-3 to 9-5, 10-3, 10-4, 11-4, 11-7, 13-3 and APP 2-18	11 July 2016	10 November 2016



Transmittal note

Amendment 59

to the

International Standards
and Recommended Practices

AERONAUTICAL CHARTS

(Annex 4 to the Convention on International Civil Aviation)

1. Insert the following replacement pages in Annex 4 (Eleventh Edition) to incorporate Amendment 59 which becomes applicable on 10 November 2016:
 - a) Page (xvii) — Foreword
 - b) Pages 7-2 and 7-3 — Chapter 7
 - c) Pages 8-3 and 8-4 — Chapter 8
 - d) Pages 9-3 to 9-5 — Chapter 9
 - e) Pages 10-3 and 10-4 — Chapter 10
 - f) Pages 11-4 and 11-7 — Chapter 11
 - g) Page 13-3 — Chapter 13
 - h) Page APP 2-18 — Appendix 2
 2. Record the entry of this amendment on page (iii).
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<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
55 (11th Edition)	Secretariat with the assistance of the RNPSORSG; proposals by AP/1; and Recommendation 9/3 of IFPP/WG/WHL/1.	Definitions and new provisions relating to performance-based navigation terminology; symbols for wind turbines; a hierarchy of symbols for significant points, and publication of bearings and tracks additionally as True values.	4 March 2009 20 July 2009 19 November 2009; 18 November 2010
56	Secretariat with the assistance of the Aeronautical Information Services-Aeronautical Information Management Study Group (AIS-AIMSG)	Definitions and new provisions relating to cyclic redundancy check (CRC) and an extended applicability date for the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic).	24 February 2010 12 July 2010 18 November 2010; 12 November 2015
57	Secretariat with assistance from the Aeronautical Information Services to Aeronautical Information Management Study Group (AIS-AIMSG)	Integrity of aeronautical data.	27 February 2013 15 July 2013 14 November 2013
58	Seventh, eighth, ninth, tenth and eleventh meetings of the Instrument Flight Procedure Panel Working Group of the Whole (IFPP/WG-WHL/7, 8, 9, 10 and 11)	Amendment concerning procedure design criteria and charting requirements to support helicopter point-in-space (PinS) approach and departure operations.	3 March 2014 14 July 2014 13 November 2014
59	Second meeting of the Operational Data Link Panel (OPLINKP/2); and twelfth meeting of the Instrument Flight Procedure Panel (IFPP/12)	Provisions concerning satellite voice communications (SATVOICE); visual segment surface (VSS) penetrations charting requirements; and update of the provisions relating to publication depiction and functionality requirements of fly-by and fly-over significant points, area minimum altitude (AMA), CAT H procedures and en-route airway directional use restrictions.	22 February 2016 11 July 2016 10 November 2016

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 Enroute 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 **Recommendation.**— *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.

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

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

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;

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

- e) all significant points which define the ATS routes and are not marked by the position of a radio navigation aid, together with their name-codes and geographical coordinates in degrees, minutes and seconds;
- f) in respect of waypoints defining VOR/DME area navigation routes, additionally,
 - 1) the station identification and radio frequency of the reference VOR/DME;
 - 2) the bearing to the nearest tenth of a degree and the distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference VOR/ DME, if the waypoint is not collocated with it;
- g) an indication of all compulsory and “on-request” reporting points and ATS/MET reporting points;
- h) the distances to the nearest kilometre or nautical mile between significant points constituting turning points or reporting points;

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

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

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

- j) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 metres or 100 feet (see Annex 11, 2.22);
- k) communication facilities listed with their channels and, if applicable, logon address and satellite voice communications (SATVOICE) number; and
- l) air defence identification zone (ADIZ) properly identified.

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

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.

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

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

8.9.4 Air traffic services system

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

8.9.4.1.1 The components shall include the following:

- a) the radio navigation aids associated with the air traffic services system, together with their names, identifications, frequencies and geographical coordinates in degrees, minutes and seconds;
- b) in respect of DME, additionally the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);
- c) terminal radio aids which are required for outbound and inbound traffic and for holding patterns;
- d) the lateral and vertical limits of all designated airspace and the appropriate class of airspace;
- e) the designation of the navigation specification(s) including any limitations, where established;
- f) holding patterns and terminal routings, together with the route designators, and the track to the nearest degree along each segment of the prescribed airways and terminal routings;
- g) all significant points which define the terminal routings and are not marked by the position of a radio navigation aid, together with their name-codes and geographical coordinates in degrees, minutes and seconds;
- h) in respect of waypoints defining VOR/DME area navigation routes, additionally,
 - 1) the station identification and radio frequency of the reference VOR/DME;
 - 2) the bearing to the nearest tenth of a degree and the distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference VOR/DME, if the waypoint is not collocated with it;
- i) an indication of all compulsory and “on-request” reporting points;
- j) the distances to the nearest kilometre or nautical mile between significant points constituting turning points or reporting points;

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

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

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

- l) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 metres or 100 feet (see Annex 11, 2.22);
- m) established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;

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

Note 2.— Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — ICAO may be provided (see Chapter 21), in which case the elements indicated by 8.9.4.1.1, l), need not be duplicated on the Area Chart — ICAO.

- n) area speed and level/altitude restrictions where established;
- o) communication facilities listed with their channels and, if applicable, logon address and SATVOICE number; and
- p) an indication of “flyover” significant points.

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

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

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:

- a) a graphic portrayal of each standard departure route — instrument, including:
 - 1) for departure procedures designed specifically for helicopters, the term “CAT H” shall be depicted in the departure chart plan view;
 - 2) route designator;
 - 3) significant points defining the route;
 - 4) track or radial to the nearest degree along each segment of the route;
 - 5) distances to the nearest kilometre or nautical mile between significant points;
 - 6) minimum obstacle clearance altitudes, along the route or route segments and altitudes required by the procedure to the nearest higher 50 m or 100 ft and flight level restrictions where established;

- 7) where the chart is drawn to scale and vectoring on departure is provided, established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;

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

Note 2.— Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — ICAO may be provided (see Chapter 21), in which case the elements indicated by 9.9.4.1.1, a) 6), need not be duplicated on the Standard Departure Chart — Instrument (SID) — ICAO.

- b) the radio navigation aid(s) associated with the route(s) including:
 - 1) plain language name;
 - 2) identification;
 - 3) frequency;
 - 4) geographical coordinates in degrees, minutes and seconds;
 - 5) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);
- c) the name-codes of the significant points not marked by the position of a radio navigation aid, their geographical coordinates in degrees, minutes and seconds and the bearing to the nearest tenth of a degree and distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference radio navigation aid;
- d) applicable holding patterns;
- e) transition altitude/height to the nearest higher 300 m or 1 000 ft;
- f) the position and height of close-in obstacles which penetrate the obstacle identification surface (OIS). A note shall be included whenever close-in obstacles penetrating the OIS exist but which were not considered for the published procedure design gradient;

Note.— In accordance with PANS-OPS, Volume II, information on close-in obstacles is provided by the procedures specialist.

- g) area speed restrictions, where established;
- h) the designation of the navigation specification(s) including any limitations, where established;
- i) all compulsory and “on-request” reporting points;
- j) radio communication procedures, including:
 - 1) call sign(s) of ATS unit(s);
 - 2) frequency and, if applicable, SATVOICE number;
 - 3) transponder setting, where appropriate;
- k) an indication of “flyover” significant points.

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

9.9.4.3 Aeronautical database requirements

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

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

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

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

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:

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

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

Note 2.— Where excessive chart clutter will result, an ATC Surveillance Minimum Altitude Chart — ICAO may be provided (see Chapter 21), in which case the elements indicated by 10.9.4.1.1, a) 6), need not be duplicated on the Standard Arrival Chart — Instrument (STAR) — ICAO.

- b) the radio navigation aid(s) associated with the route(s) including:
 - 1) plain language name;
 - 2) identification;
 - 3) frequency;
 - 4) geographical coordinates in degrees, minutes and seconds;
 - 5) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);
- c) the name-codes of the significant points not marked by the position of a radio navigation aid, their geographical coordinates in degrees, minutes and seconds and the bearing to the nearest tenth of a degree and distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference radio navigation aid;
- d) applicable holding patterns;
- e) transition altitude/height to the nearest higher 300 m or 1 000 ft;
- f) area speed restrictions, where established;
- g) the designation of the navigation specification(s) including any limitations, where established;
- h) all compulsory and “on-request” reporting points;
- i) radio communication procedures, including:
 - 1) call sign(s) of ATS unit(s);
 - 2) frequency and, if applicable, SATVOICE number;
 - 3) transponder setting, where appropriate;
- j) an indication of “flyover” significant waypoints; and
- k) for arrival procedures to an instrument approach designed specifically for helicopters, the term “CAT H” shall be depicted in the arrival chart plan view.

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

10.9.4.3 Aeronautical database requirements

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

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

11.7.3 **Recommendation.**— *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, should also be shown printed in black.*

Note 1.— *The next higher suitable contour line appearing on base topographic maps exceeding 150 m (500 ft) above the aerodrome elevation may be selected to start layer tinting.*

Note 2.— *An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in Appendix 3 — Colour Guide for contours and topographic features.*

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

11.8 Magnetic variation

11.8.1 **Recommendation.**— *The magnetic variation should 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, except as provided for in 11.9.2. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, e.g. 290° (294.9°T).

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

11.9.2 **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.*

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

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:

- a) the aerodrome on which the procedure is based;
- b) aerodromes affecting the traffic pattern or so situated as to be likely, under adverse weather conditions, to be mistaken for the aerodrome of intended landing.

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

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

11.10.2 Obstacles

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

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

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

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

11.10.2.4 **Recommendation.**— *The heights of obstacles above a datum other than mean sea level (see 11.10.2.3) should 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 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.

11.10.2.8 Obstacles that penetrate the visual segment surface (VSS) shall be identified on the chart.

Note.— *Guidance on the charting of VSS penetrations can be found in the Aeronautical Chart Manual (Doc 8697).*

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

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.

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

11.10.8.4 **Recommendation.**— *A rate of descent table should 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 to the nearest half metre or foot and the glide path/elevation/vertical path angle to the nearest one-tenth of a degree shall be shown.

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

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 *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS, Doc 8168), Volume II, a cautionary note shall be included.

11.10.9 Aeronautical database requirements

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

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

- j) where established, standard routes for taxiing aircraft with their designators;
- k) the boundaries of the air traffic control service;
- l) position of runway visual range (RVR) observation sites;
- m) approach and runway lighting;
- n) location and type of the visual approach slope indicator systems with their nominal approach slope angle(s), minimum eye height(s) over the threshold of the on-slope signal(s), and where the axis of the system is not parallel to the runway centre line, the angle and direction of the displacement, i.e. left or right;
- o) relevant communication facilities listed with their channels and, if applicable, logon address and SATVOICE number;
- p) obstacles to taxiing;
- q) aircraft servicing areas and buildings of operational significance;
- r) VOR checkpoint and radio frequency of the aid concerned;
- s) any part of the depicted movement area permanently unsuitable for aircraft, clearly identified as such.

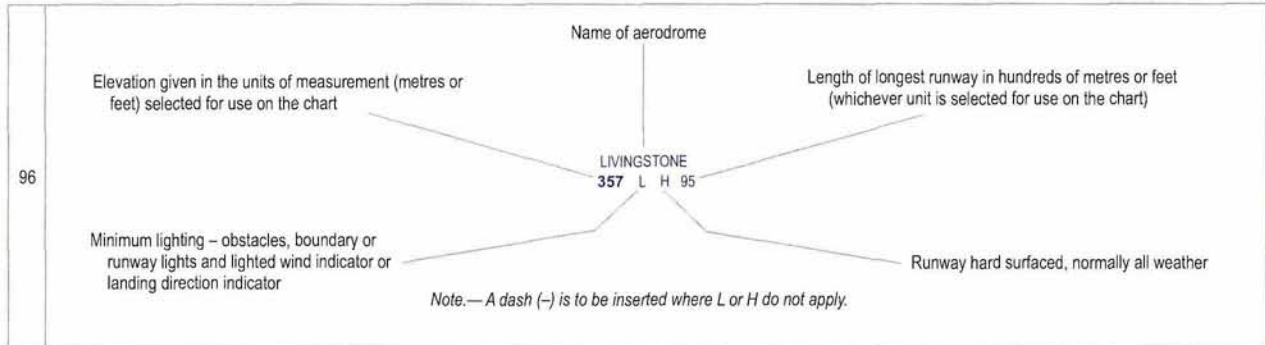
13.6.2 In addition to the items in 13.6.1 relating to heliports, the chart shall show:

- a) heliport type;



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

- b) touchdown and lift-off area including dimensions to the nearest metre, slope, type of surface and bearing strength in tonnes;
- c) final approach and take-off area including type, true bearing to the nearest degree, designation number (where appropriate), length and width to the nearest metre, slope and type of surface;
- d) safety area including length, width and type of surface;
- e) helicopter clearway including length and ground profile;
- f) obstacles including type and elevation of the top of the obstacles to the nearest (next higher) metre or foot;
- g) visual aids for approach procedures, marking and lighting of final approach and take-off area, and of touchdown and lift-off area;
- h) declared distances to the nearest metre for heliports, where relevant, including:
 - 1) take-off distance available;
 - 2) rejected take-off distance available;
 - 3) landing distance available.














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
















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	
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RADIO NAVIGATION AIDS*

99	Basic radio navigation aid symbol <i>Note.— This symbol may be used with or without a box to enclose the data.</i>				
100	Non-directional radio beacon NDB		107	Collocated VOR and TACAN radio navigation aids VORTAC	
101	VHF omnidirectional radio range VOR		108	Instrument landing system ILS	PLAN VIEW  Electronic  PROFILE  Electronic  GLIDE PATH
102	Distance measuring equipment DME		109	Radio marker beacon	Elliptical  Bone Shape 
103	Collocated VOR and DME radio navigation aids VOR/DME		Note.— Marker beacon may be shown by outline, or stipple, or both.		
104	DME distance	Distance in kilometres (nautical miles) to DME → 15 km Identification of radio navigation aid → K A V			
105	VOR radial	Radial bearing from, and identification of, VOR R 090 K A V			
106	UHF tactical air navigation aid TACAN				

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 border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">VOR</td> <td style="width: 50%; text-align: center;"></td> </tr> <tr> <td>VOR/DME</td> <td style="text-align: center;"></td> </tr> <tr> <td>TACAN</td> <td style="text-align: center;"></td> </tr> <tr> <td>VORTAC</td> <td style="text-align: center;"></td> </tr> </table>	VOR		VOR/DME		TACAN		VORTAC	
VOR											
VOR/DME											
TACAN											
VORTAC											
	Note.— Additional points of compass may be added as required.										

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

AIR TRAFFIC SERVICES

111	Flight information region	FIR		117	Air defence identification zone	ADIZ	
112	Aerodrome traffic zone	ATZ		118	Advisory route	ADR	Alternative
113	Control area Airway Controlled route	CTA AWY	Alternative 				
115	Advisory airspace	ADA		119	Visual flight path	compulsory with radio communication requirement	
						compulsory, without radio communication requirement	
						recommended	
116	Control zone	CTR		120	Scale-break (on ATS route)	Alternative 	

Significant Point Functionality								
		Significant point depiction for conventional navigation		Significant point depiction for area navigation				
REPORTING FLY-BY/FLY-OVER		On request (NA)	Compulsory (NA)	On request fly-by	Compulsory fly-by	On request flyover	Compulsory flyover	
121	Basic Symbols with functionality	VFR reporting point						
		Intersection INT						
		VORTAC						
		TACAN						
		VOR						
		VOR/DME						
		NDB						
		Waypoint WPT	Not used	Not used				

For details on use and meaning of these symbols, refer to paragraph 2.4

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