NATO STANDARD

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SPECIAL AERONAUTICAL CHARTS (SAC)

Edition A Version 1

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NORTH ATLANTIC TREATY ORGANIZATION

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NORTH ATLANTIC TREATY ORGANIZATION (NATO)

NATO STANDARDIZATION OFFICE (NSO)

NATO LETTER OF PROMULGATION

8 March 2018

1. The enclosed Allied Geographic Publication AGeoP-23, Edition A, Version 1, SPECIAL AERONAUTICAL CHARTS (SAC), which has been approved by the nations in the Military Committee Joint Standardization Board, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 7164.

2. AGeoP-23, Edition A, Version 1, is effective upon receipt

3. No part of this publication may be reproduced, stored in a retrieval system, used commercially, adapted, or transmitted in any form or by any means, electronic, mechanical, photo-copying, recording or otherwise, without the prior permission of the publisher. With the exception of commercial sales, this does not apply to member or partner nations, or NATO commands and bodies.

4. This publication shall be handled in accordance with C-M(2002)60.

Zoltán GULYÁS
Brigadier General, HUNAF
Director, NATO Standardization Office

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RESERVED FOR NATIONAL LETTER OF PROMULGATION

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RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS
Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

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RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]
DEU	Only vertical obstructions as of 100 m will be represented, until DEU authorities provide also those over 60 m. According to the air traffic statute. Page 1-4, para. 24 insert: … and must not be considered … Page 1-4, para. 25 delete: … obstructions with a vertical extent of 200 ft AGL and … insert: ... obstructions with a vertical extent of 328 ft AGL and …
FRA	The DIRCAM/DIA and the EGI (Établissement géographique interarmées) publish the LFC 500k DIRCAM, SAC FR instead of the TPC. The publication cycles proposed in STANAG 7164 are AIRAC cycles 4 and 10. SACs France are published at cycles 5 and 11, jointly with the SIA (the national aeronautical information service with which shifting chart publication is unthinkable as different aeronautical information woud be provided to air users). The DIRCAM does not publish 250k air charts, because this format is not used by military air formations. Armed forces do not produce any equivalent to TFC(L) charts (the DGAC alone produces 6 charts 250k air, also at cycles 5 and 11).
SVN	The Ministry of Defense of the Republic of Slovenia will use this STANAG as a reference document only, being user, not producer of SAC.
Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

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CHAPTER 1 MINIMUM REQUIREMENTS FOR SACS

1.1. INTRODUCTION

1. For the purposes of this AGeoP, low level is defined as the airspace at or below 2000ft above ground level (AGL), and medium level is defined as the airspace between 2000ft AGL and 7000ft AGL. These limits may be varied to accommodate national regulations or for overriding flight safety considerations.

1.2. FORMAT

2. Producing nations will determine the size and number of charts needed to meet their national requirements. There is no requirement to follow standard sheet lines such as those for series TPC or JOG 1501-AIR. Adjoining sheets within a national series should include top and right bleed edges with overlaps, where national production systems allow, of approximately 8km (ground distance) at 1:500,000 scale and 5km at 1:250,000 scale.

3. Charts must be no larger than 1100 x 1500mm, the maximum size most large format printing machines can handle, as stated in STANAG 3666.

1.3. GEODESY

4. Charts will be produced on WGS 84 horizontal datum, with mean sea level as the vertical datum. Those produced at 1:500,000 scale will be on a Lambert Conformal Conical projection with a 30’ graticule whilst those at 1:250,000 scale will be on the Transverse Mercator projection with at least a 15’ graticule.

5. A full, fine line UTM grid with Military Grid Reference System (MGRS) annotations should be depicted. However 100,000m square intersections instead of a full, fine line UTM grid may be used on 1:500,000 scale charts. STANAG 2211 – Geodetic Datums, Projections, Grids and Grid References will apply.

1.4. ACCURACY

6. Horizontal accuracy: 90% of planimetric (topographic and aeronautical) features, except those unavoidably displaced by exaggerated symbology, will be plotted as accurately as source information permits.

7. Vertical accuracy: spot elevations to be within 100ft and contours to be within one half of the contour interval. For further accuracy measures STANAG 2215 will apply.

8. For symbology, the centre and orientation of all features are to be plotted so as to maintain true relative position and alignment within the constraints of scale.

1.5. MARGINALIA

9. All charts should contain at least one identification panel containing the Series, Sheet and Edition identifiers.

Examples:

Series	LFC-Europe
Sheet	3-United Kingdom (D)
Edition	5-GSGS

Series	LFC-Europe
Sheet	1-Baltic States
Edition	3-LGIA

10. For charts at 1:500,000 scale, the series identifier should consist of the letters ‘LFC’ (Low Flying Chart), followed by a hyphen, followed by the name of the continent covering the majority of the chart, in upper and lower case. If Day and Night versions of a chart are produced, ‘(D)’ or ‘(N)’ should be added after the Sheet number. Refer to STANAG 7136 for further information on Sheet and Edition identifiers.

11. The marginalia will include a chart title consisting of the words ‘LOW FLYING CHART’, followed by the name of the continent in which the country being depicted lies, in upper case, followed by the word ‘SHEET’, followed by the Sheet name, in upper case.

Examples:

LOW FLYING CHART – EUROPE SHEET 3-UNITED KINGDOM
LOW FLYING CHART – EUROPE SHEET 1-BALTIC STATES

12. For charts at 1:250,000 scale, where the Series identifier consists of a Standard Series Designation with an ‘AIR’ suffix, they should be separated with a hyphen.

Example:

M517-AIR

13. The marginalia will contain a legend or, where space is limited, be printed separately and designed to support the series as a whole. For the languages of the Legend information, see STANAG 3676 para 5. Chief Geographic Officer, SHAPE shall be the final arbiter in cases of dispute over which additional language to use. Legend information is to be compliant with STANAG 3676.

14. A diagram will be included to show SAC availability. An adjacent note must give guidance as to which chart takes precedence in cases where overlapping series SACs provide duplicate coverage.

15. Marginalia pertaining to aeronautical information must show:

a. the effective date of the aeronautical information depicted

b. procedures for obtaining updates between editions, for example, the *Consult NOTAMs* note

16. If possible, the effective date of the next edition should be included.

1.6. TOPOGRAPHIC BASE INFORMATION

17. The topographic base requirements for SACs at 1:500,000 and 1:250,000 scales should comply with the specifications set out in Series LFC or JOG 1501-AIR respectively. However, a sufficient density of ground features will be included to enable rapid visual recognition at low altitude without cluttering the chart. Such features assume greater value in areas of sparse cultural detail. The base should be revised whenever possible, preferably annually.

18. Whenever a cultural feature is prominent and unique, and it is an instantly recognisable point of reference for the user, the feature should be shown by a landmark symbol.

19. The relationships between topographic features may be of more navigational significance than the individual features in isolation. For example, the visual outline of a populated place may not appear unique or significant to the user but when nearby confirmatory features such as roads, water features or railways are included, it may aid positive identification. Consideration should be given to enhancing such relationships.

20. Ground elevation heights will be measured in feet. The contour intervals shown on SACs at 1:500,000 and 1:250,000 scales will comply with those published in the LFC and JOG 1501-AIR specifications respectively.

21. Depiction of terrain can be enhanced by hypsometric (layer) tinting at appropriate intervals. In addition, hill shading may also be included at the producer's discretion.

1.7. AERONAUTICAL INFORMATION

22. SACs will contain aeronautical information, provided by the responsible Air Traffic Service authority, depicted in feet, to support safe low level navigation. The information shown will be consistent with scale, legibility and national flight safety requirements. Aeronautical information surveyed by another NATO or partner nation may be used, if a SACs responsible Air Traffic Service Authority does not or is not able to provide this information.

23. Aeronautical information with a base height commencing at or below 10,000ft AGL should be included on SACs. This vertical limit may be varied by individual nations for overriding flight safety reasons or to avoid excessive chart clutter. However, chart producing nations will clearly state the selected limit in the chart marginalia.

24. As SACs are generally produced at pre-set intervals, the aeronautical information shown could be obsolete and should not be considered authoritative. Therefore producing nations will include a warning on the chart.

25. SACs will show all known obstructions with a vertical extent of 200ft AGL and above. However, this height may be revised downwards to support the very low operating heights permitted within specific areas. At larger scales and/or over sea, a lower vertical extent maybe used. Suspended obstructions will be clearly differentiated from point obstructions.

26. SACs will show clearly the maximum vertical extent of obstructions both above ground level (AGL) and above mean sea level (AMSL). For obstructions at sea only one figure AGL/AMSL need be used. At larger scales for obstructions of low vertical extent, only AGLs are used. In order that users are aware of the minimum height above which all known obstacles are shown (inclusion criteria), producing nations will include a clear statement of the inclusion criteria used, either diagrammatically, or as a written statement, in the chart marginalia.

27. In some cases compliance may be difficult, for example charts with a multinational coverage, or having areas with differing inclusion criteria, leading to overly complex diagrams or statements. To simplify interpretation, a single inclusion criteria figure may be applied to the complete chart. In this case the figure quoted will be the highest used during the production of the chart.

28. The following colours will be used to depict aeronautical information that may be contained within a series of overprints:

a. Blue[1]: airspace descriptions and information for navigation, airfields, airspace activities and obstructions at sea, helicopter routes over sea.

b. Red: low level avoidances and caution information, airspace reservation areas, prohibited and danger areas, special use airspace.

c. Purple or Violet: information specific to low level flying operations, low flying routes/corridors/flows.

d. Green: military night low level flying procedures

See STANAGs 3412 and 3675 for greater detail.

1.8. PRODUCTION

29. Charts will be produced with the most up to date aeronautical information.

30. All data must be ahead to acceptable quality levels at either 1:500,000 and 1:250,000. Refer to STANAG 2215 for acceptable quality limits for topographical and aeronautical information.

1.9. EXCHANGE FORMAT

31. Transmitting or exchanging digital SAC information between NATO nations, NATO commands and NATO partner nations are recommended to use the following formats:

a. VECTOR: NATO Geospatial Information Framework (NGIF) (STANAG 2592) or DIGEST (STANAG 7074). DIGEST is for legacy use meaning current systems only;
b. RASTER: Arc Standard Raster Product (ASRP) (STANAG 4387);
c. Compressed Arc Digitized Raster Graphics (CADRG) (STANAG 7098).
d. GeoTIFF (DGIWG profile)

32. These exchange formats are recommended, it's appreciated that systems may require other formats like Aeronautical Information Exchange Model (AIXM) to operate.

[1] DEU is using another colour is some cases.

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CHAPTER 2 GLOSSARY OF TERMS

special aeronautical chart / carte aéronautique spéciale
A topographic chart with aeronautical information designed to meet military peacetime requirements for low level air navigation.

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