NATO STANDARD

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AERONAUTICAL INFORMATION ON AERONAUTICAL CHARTS

Edition A Version 1
OCTOBER 2015

NORTH ATLANTIC TREATY ORGANIZATION

ALLIED GEOGRAPHIC PUBLICATION

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NORTH ATLANTIC TREATY ORGANIZATION (NATO)

NATO STANDARDIZATION OFFICE (NSO)

NATO LETTER OF PROMULGATION

8 October 2015

1. The enclosed Allied Geographic Publication AGeoP-16, Edition A, Version 1, AERONAUTICAL INFORMATION ON AERONAUTICAL CHARTS, 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 3412.

2. AGeoP-16, Edition A, Version 1 is effective upon receipt.

3.

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

Edvardas MAŽEIKIS
Major General, LTUAF
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 of 100m will be represented, until DEU authorities provide also those over 60m.
DNK	2.1.5. Vertical Obstructions: Only vertical obstructions over 100 meter (328 feet) above ground level (AGL) will be portrayed in Danish produced maps UFN." Wind Turbines will be portrayed as described in ICAO annex 4 in Danish produced maps.
FRA	Only the new criteria for the portrayal of the maximum elevation figures will be incorporated in the implementation documents referred to in paragraph 1.c. of this decision. The reservations expressed for the previous edition are maintained: • Vertical obstructions: France only portrays obstructions of or over 300 feet above ground level, except for those obstructions under (or in) the very low altitude areas that are portrayed if over 160 feet. • Linear obstructions: France only portrays aerial cableways of or over 330 feet. • High voltage power lines: France only portrays lines with a voltage exceeding 63 000 volts. Power lines with a voltage lower than 63 000 volts and that can locally exceed 330 feet are not portrayed, except in special cases. • High intensity radio transmission areas: France does not portray these areas ; they will be portrayed once France has set criteria for selection. • Colours: France does not use the USAF and RAF colours, but uses those defined in the specifications of the LCF FRANCE-DIRCAM chart.
LVA	LVA, as a geospatial information producer, will gradually implement the stated requirements which affect production or particular geospatial products, in synchronization with existing approved national geospatial information development plans and production cycles.
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CHAPTER 1 INTRODUCTION

1.1. AERONAUTICAL INFORMATION

1.1.1. Rationale

Aeronautical information changes more rapidly than the base information. Since obsolete information can be hazardous to the user, nations will ensure adequate currency of the information portrayed, either by publishing a new edition, or by circulating correction notices to all users for the manual correction of the relevant chart(s).

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CHAPTER 2 PORTRAYAL ON THE CHARTS

2.1 INFORMATION TO BE PORTRAYED AT ALL SCALES

On the aeronautical charts, the following categories of information are to be portrayed mandatory at all scales:

2.1.1. Aerodromes

Aerodromes, according to STANAG JGS 3675 symbology, will be portrayed with the following annotations:

- Status (closed, disused or abandoned);
- Name;
- Length of longest runway;
- Elevation.

2.1.2. Radio navigation aids

Radio navigation aids, according to STANAG JGS 3675, will be portrayed.

2.1.3. Maximum Elevation Figures (MEF)

MEF, according to STANAG 3675, will be portrayed and calculated as indicated in Annex A and B.

2.1.4. Isogonals

Isogonals will be portrayed according to STANAGs 3600, 3675 and 3676.

2.1.5. Vertical obstructions

Vertical obstructions, such as antennas, chimneys, pylons, wind turbines/wind mills, etc, over 61 meters (200 feet) above ground level (AGL) will be portrayed according to STANAGs JGS 3600, 3675 and 3676.

Where national specifications are more stringent, products may be produced accordingly.

All vertical obstructions, even smaller than 61 meters, that could threaten the flight safety could be portrayed on the aeronautical charts.

2.1.6. Linear obstructions

Linear obstructions, such as aerial cableways, ski-lift lines, etc, over 61 meters (200 feet) AGL. will be portrayed according to STANAGs JGS 3600, 3675 and 3676.

Where National specifications are more stringent, products may be produced accordingly.

All linear obstructions, even smaller than 61 meters (200 feet) AGL, that could threaten the flight safety could be portrayed on the aeronautical charts.

2.1.7. High Voltage Power Lines

Power Transmission Lines or High-voltage Lines will be portrayed according to STANAGs JGS 3600 and 3675.

2.2 INFORMATION MANDATORY AT SCALE 1:500,000 AND SMALLER

The following information will be selected to a density compatible with the scale on which they are shown.

2.2.1. Airspace reservation

Airspace reservation will be portrayed according to STANAG JGS 3675.

2.2.2. High Intensity Radio Transmission Areas (HIRTAs)

HIRTAs will be portrayed according to STANAG JGS 3675.

HIRTAs will not be shown on aeronautical charts with scales of 1:500,000 and smaller, until the criteria for selection has been internationally agreed.

2.3 COLOURS OF AERONAUTICAL INFORMATION

All information described in clauses 2.1 and 2.2, including relevant marginal information, should be shown in a colour equivalent to USAF/USN Overprint Blue, RAF Deep Electric Blue according to STANAGs JGS 3600, 3675 and 7164 or ICAO Dark Blue according to ICAO Annex 4.

If it is required for some areas to print aeronautical information in a higher density than normal, to solve possible clutter, then some of the aeronautical element listed in the clauses 2.1 and 2.2 may be portrayed with one or more additional colors. The preferable additional colour will be Purple, or the ICAO Magenta. Other usable colours

will be Red, Aeronautical Green and possibly Orange. Nations may refer to the latest edition of the “Standard Printing Color Catalog (SPC)”.

Standard Printing Colors (SPC) values corresponding each colour are indicated in the following schema:

COLOUR	SPC VALUES
USAF/USN Overprint Blue	46351
RAF Deep Electric Blue	46250
ICAO Dark Blue	46351
Purple	95151
ICAO Magenta	61121
Red	60862
Aeronautical Green	51411
Orange	60853

However, where only one colour is used to show the aeronautical elements, the here above defined blue colour must be used.

2.4 ADDITIONAL ITEMS

Where national specifications require use of the English system for statement of height or elevation concerning the information indicated at clause 2.1, products may be produced accordingly.

Acceptance of this agreement does not preclude participants from showing additional aeronautical information categories on certain aeronautical charts, if required to meet peacetime training needs.

In those cases where additional categories of information are portrayed on designated (see NATO Geospatial Policy) standard charts, participants will ensure that all the additional information will be depicted in one or more of the additional colour(s) specified in clause 2.3.

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ANNEX A CRITERIA FOR MAXIMUM ELEVATION FIGURE FOR AERONAUTICAL CHARTS

A.1 INTRODUCTION

The aim of this Annex is to standardize the computation of Maximum Elevation Figures (MEF) when they are to be shown within designated quadrangles on aeronautical charts. This Annex is based on the premise that an operational requirement exists to identify obstructions which are 200 feet or greater in height AGL.

A.2 AGREEMENT

Participating nations agree that:

A.2.1 The MEF will be shown in thousands and hundreds of feet on the face of the chart in each designated quadrangle. As a guide, the designated quadrangles will normally be as indicated as follows:

a. Scale 1:1,000,000

0° - 56° latitude	One degree quadrangle.
56° - 72° latitude	Two degrees (even) of longitude, one degree of latitude.
72° - 84° latitude	Four degrees (even numbers divisible by 4) of longitude, one degree of latitude.
84° - 90° latitude	Twelve degrees (even) of longitude, one degree of latitude.

b. Scale 1:500,000

0° - 56° latitude	Thirty minute quadrangle.
56° - 72° latitude	One degree of longitude, thirty minutes of latitude.
72° - 84° latitude	Two degrees of longitude, thirty minutes of latitude.
84° - 90° latitude	Six degrees (even) of longitude, thirty minutes of latitude.

c. Scale 1:250,000

0° - 56° latitude	Fifteen minute quadrangle.
56° - 72° latitude	Thirty minutes of longitude, fifteen minutes of latitude.
72° - 84° latitude	One degree of longitude, fifteen minutes of latitude.
84° - 90° latitude	Three degrees of longitude, fifteen minutes of latitude.

A.2.2 The method indicated below will be used for developing the MEF in each quadrangle when the highest point is either a natural terrain feature or a man-made obstruction (represented or not):

a. Obstruction calculation: Determine the elevation above mean sea level (AMSL) of the top of the highest man-made obstruction. Add to it an Obstruction Elevation Accuracy Figure.

b. Terrain calculation: Determine the elevation AMSL of the highest natural terrain feature plus the Non Represented Allowance (NRA).

c. Add the Terrain Elevation Accuracy Figure of the source material to (a.) and (b.).

d. Round up both resultant figures up to the next higher hundred foot level, if necessary, to achieve a complete value in hundreds of feet. The higher of the two figures will become the MEF.

Examples of typical calculations are shown at Annex B.

A.2.3 For nations and areas where man-made obstruction data is incomplete, the allowance for non-represented man-made obstructions should equate to the lowest height for which data on man-made obstructions is considered to be sufficiently complete.

ANNEX B EXAMPLES OF TYPICAL CALCULATIONS

The following three examples have assumed the contour interval to be 100 feet. Therefore the Terrain Height Accuracy Figure is taken as half the contour interval.

B.1. Calculation of MEF where man-made obstruction is highest feature and NRA is 200 feet:

(1) Highest Obstruction Elevation AMSL 630
Obstruction Elevation Accuracy Figure +25*
655

(2) Highest Terrain Elevation AMSL 320
NRA +200
520

(3) Add a Terrain Height Accuracy Figure to each sum (assessed as 50 feet):
For (1) Obstruction, 655 + 50 = 705 feet
For (2) Terrain, 520 + 50 = 570 feet.

(4) Round up each to nearest hundred feet and compare results:
Obstruction 705 rounded up = 800
Terrain 570 rounded up = 600

Thus the MEF in this example will be 800 feet.

B.2 Calculation of MEF where man-made obstruction is highest feature and NRA is 328 feet:

(1) Highest Obstruction Elevation AMSL 630
Obstruction Elevation Accuracy Figure +25*
655

(2) Highest Terrain Elevation AMSL 320
NRA +328
648

(3) Add a Terrain Height Accuracy Figure to each sum (assessed as 50 feet):
For (1) Obstruction, 655 + 50 = 705 feet
For (2) Terrain, 648 + 50 = 698 feet.

(4) Round up each to nearest hundred feet and compare results:

Obstruction 705 rounded up = 800
Terrain 698 rounded up = 700

Thus the MEF in this example will be 800 feet.

*Obstruction Elevation Accuracy Figure of 25 feet is a typical example when measuring heights from air photographs.

B.3 Calculation of MEF where man-made obstruction is highest feature and NRA is 300 feet:

(1) Highest Obstruction Elevation AMSL 366
Obstruction Elevation Accuracy Figure +10**
376

(2) Highest Terrain Elevation AMSL 159
NRA +300
459

(3) Add a Terrain Height Accuracy Figure to each sum (assessed as 50 feet):
For (1) Obstruction, 376 + 50 = 426 feet
For (2) Terrain, 459 + 50 = 509 feet.

(4) Round up each to nearest hundred feet and compare results:
Obstruction 426 rounded up = 500
Terrain 509 rounded up = 600

Thus the MEF in this example will be 600 feet.

**Obstruction Elevation Accuracy Figure of 10 feet is a typical example when measuring heights from engineering drawings when available.

ANNEX C TERMS AND DEFINITIONS

The following terms and definitions are used for the purpose of this standard:

C.1 **Aeronautical Information:**
Data on procedures, phenomena and/or selected man-made features, which are established or collected and distributed exclusively for air navigation and air operations purposes.

C.2 **Maximum Elevation Figure (MEF):**
A figure, shown in each quadrangle bounded by ticked graticule lines on aeronautical charts, which represents the elevation in thousands and hundreds of feet, above mean sea level (AMSL), of the highest known natural or man-made feature in that quadrangle.

C.3 **Non Represented Allowance (NRA):**
A figure, used in the calculation of a MEF, defined as an allowance made for obstructions which are not portrayed on the chart because they fall below the requirements of the chart specification. Whilst the NRA is normally 200 feet above ground level (AGL), chart producing nations may increase this figure to match their statutory reporting requirements for obstructions; typically 100 meters (328 feet). It incorporates suitable factors to allow for inaccuracy and incompleteness of the elevation and obstruction information.

C.4 **Obstruction Elevation Accuracy Figure:**
A variable figure, used in the calculation of a MEF, which takes account of inaccuracies in measuring the elevation of an obstruction. It will depend on nature of the source, for example, elevations derived from engineering drawings will be much more accurate than those calculated from air photographs.

C.5 **Terrain Elevation Accuracy Figure:**
A variable figure, used in the calculation of a MEF, which takes account of inaccuracies in measuring terrain elevations. When this figure is taken from a topographic map or chart, consideration must be given to the contour interval and the reliability of the map or chart.

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