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<tr>
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1 Introduction

1.1 Document Scope

The purpose of this technical note is to provide the main specification of the Galileo E6-B and E6-C codes.

Many aspects of the E6-B/C signal are already described in the Galileo Open Service Signal-In-Space Interface Control Document [RD1]. This document provides additional details, including primary codes and their assignment, as well as secondary codes, that are necessary for receiver manufacturers in order to facilitate the development of Galileo E6-B/C enabled receivers.

1.2 Reference Documents

<table>
<thead>
<tr>
<th>Id.</th>
<th>Document Title</th>
</tr>
</thead>
</table>
This chapter provides details of the Galileo E6-B/C ranging codes. Currently, the ranging codes of the E6-B and E6-C components can be transmitted either unencrypted or encrypted. E6-C codes may be encrypted in the future for use in access-controlled applications. A user may use the E6-C signal component as described in this document temporarily, but they may not be able to use it anymore when encrypted. Therefore, users and receiver manufacturers shall not assume the E6-C signal component will be permanently available. E6-C ranging code encryption is planned for future use. The description of the encryption implementation is out of the scope of this document.

2.1 Code-data coherency

The start of data symbols, of secondary code chips, and of primary code periods, are aligned as defined in [RD1]. The timing relation between chips and symbols for E6-B and E6-C components is illustrated in the following picture.

![Figure 1: E6-B and E6-C synchronisation](image)

2.2 Code Lengths

The ranging codes are built from primary and secondary codes by using a tiered code construction as described in [RD1]. The code lengths to be used for each signal component
are stated in Table 1.

<table>
<thead>
<tr>
<th>Signal Component</th>
<th>Tiered Code Period (ms)</th>
<th>Code Length (chips)</th>
<th>Primary</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>E6-B</td>
<td>1</td>
<td>5115</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>E6-C</td>
<td>100</td>
<td>5115</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Codes Lengths

2.3 Primary Codes Definition

2.3.1 E6-B and E6-C Primary Codes

The E6-B and E6-C primary codes are pseudo-random memory code sequences. Each set of codes for each signal component comprises 50 members. The E6-B and E6-C primary codes are provided in sections in A.3 and A.4.

2.4 Secondary Codes

2.4.1 Definition of Secondary Codes

The E6-C secondary codes are the CS1001-50, as defined in [RD1], and provided here in Table 2 for convenience using the [RD1] hexadecimal notation.

<table>
<thead>
<tr>
<th>Code Identifier</th>
<th>Code Length</th>
<th>No. of Hexadec. Symbols</th>
<th>Number of Filled up Zeros</th>
<th>Code Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS1001</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>83F6F69D8F6E15411FB8C9B1C</td>
</tr>
<tr>
<td>CS1002</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>66558BD3CE0C7792E83350525</td>
</tr>
<tr>
<td>CS1003</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>59A025A911A5226B779A8B31</td>
</tr>
<tr>
<td>CS1004</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>D3A32640782F7B184E4DF754B7</td>
</tr>
<tr>
<td>CS1005</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>81FCAD7760C218E59348A93</td>
</tr>
<tr>
<td>CS1006</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>BAC77E933A779140F094F81</td>
</tr>
<tr>
<td>CS1007</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>577705DE280927C6B58BA6776</td>
</tr>
<tr>
<td>CS1008</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>EFCAB4B65F38531ECA22257E2</td>
</tr>
<tr>
<td>CS1009</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>79F8C9E038475EA5584BEFC9B</td>
</tr>
<tr>
<td>CS1010</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>CA5170FEA3A810EC606B66494</td>
</tr>
<tr>
<td>CS1011</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>1FC32410652A2C49B845E67</td>
</tr>
<tr>
<td>CS1012</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>FE0A9A7AFDAC44E42CB95261</td>
</tr>
<tr>
<td>CS1013</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>B03062DC2B71995D5AD8B7DBE</td>
</tr>
<tr>
<td>CS1014</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>69C398999F59E2DF235D35D</td>
</tr>
<tr>
<td>CS1015</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>1BB2FB8B5FB24395C2EF3C5A1</td>
</tr>
<tr>
<td>CS1016</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>2F920687D238CC7046EF6APC9</td>
</tr>
<tr>
<td>CS1017</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>341638865C4B477F2A92EDDBB8</td>
</tr>
<tr>
<td>CS1018</td>
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<td>25</td>
<td>0</td>
<td>66A872CE498338PB2D5625AD</td>
</tr>
<tr>
<td>CS1019</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>99D5A70162C920A4BB9DE1CA8</td>
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</tbody>
</table>
### Table 2: E6-C Secondary Codes

<table>
<thead>
<tr>
<th>Code Identifier</th>
<th>Code Length</th>
<th>No. of Hexadec. Symbols</th>
<th>Number of Filled up Zeros</th>
<th>Code Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS100\textsubscript{20}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>81D71BD6E069A7ACCBE6C66CA</td>
</tr>
<tr>
<td>CS100\textsubscript{21}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>A654524074A9E6780DB9D3EC6</td>
</tr>
<tr>
<td>CS100\textsubscript{22}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>C3396A101BEDAF623CFC5BB37</td>
</tr>
<tr>
<td>CS100\textsubscript{23}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>C3D4AB211DF36F2111F2141CD</td>
</tr>
<tr>
<td>CS100\textsubscript{24}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>3DFF25EAE761739265AF145C1</td>
</tr>
<tr>
<td>CS100\textsubscript{25}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>994909E0757D7D0CE389102B5</td>
</tr>
<tr>
<td>CS100\textsubscript{26}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>B938535522D119F40C25FDAEC</td>
</tr>
<tr>
<td>CS100\textsubscript{27}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>C71AB549C0491537026B390B7</td>
</tr>
<tr>
<td>CS100\textsubscript{28}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>61C5FA252F1AF81144766494F</td>
</tr>
<tr>
<td>CS100\textsubscript{29}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>626027778FD3C6BB4BAA7A59D</td>
</tr>
<tr>
<td>CS100\textsubscript{30}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>E745412FF53DEBD03F1C9A633</td>
</tr>
<tr>
<td>CS100\textsubscript{31}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>3592AC083F3175FA724639098</td>
</tr>
<tr>
<td>CS100\textsubscript{32}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>52284D941C3DAF2721D8B1FD</td>
</tr>
<tr>
<td>CS100\textsubscript{33}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>73B3D8F0AD5BF4EB14ED890</td>
</tr>
<tr>
<td>CS100\textsubscript{34}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>94BF16C83BD7462F6498E0282</td>
</tr>
<tr>
<td>CS100\textsubscript{35}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>A8C3D1AC666089B045B359D</td>
</tr>
<tr>
<td>CS100\textsubscript{36}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>E23FFC2DD2C14388AB06BEC8</td>
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<td>0</td>
<td>F2AC871CDF89DDC06B596D2B</td>
</tr>
<tr>
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<td>25</td>
<td>0</td>
<td>C3D8106A752F961263A0F749F56</td>
</tr>
<tr>
<td>CS100\textsubscript{39}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>364A39EB0F0481DA0199D07E</td>
</tr>
<tr>
<td>CS100\textsubscript{40}</td>
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<td>25</td>
<td>0</td>
<td>F665A7EA441BAA4EA0D01078C</td>
</tr>
<tr>
<td>CS100\textsubscript{41}</td>
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<td>25</td>
<td>0</td>
<td>46F3D3043F24CDEAB6D79543</td>
</tr>
<tr>
<td>CS100\textsubscript{42}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>E23EB254616BD96CEFCA651A</td>
</tr>
<tr>
<td>CS100\textsubscript{43}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>E548231A82F9A019DB5E1B2</td>
</tr>
<tr>
<td>CS100\textsubscript{44}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>265C7F9A16F49DED2A7060C</td>
</tr>
<tr>
<td>CS100\textsubscript{45}</td>
<td>100</td>
<td>25</td>
<td>0</td>
<td>9810A7898961263A0F749F56</td>
</tr>
</tbody>
</table>

### 2.4.2 Secondary Codes Assignment

The assignment of the secondary codes to the signal components is according to Table 3. For the E6-C component, an independent secondary code is assigned for each primary code.

<table>
<thead>
<tr>
<th>Component</th>
<th>Secondary Code Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>E6-B</td>
<td>N/A</td>
</tr>
<tr>
<td>E6-C</td>
<td>CS100\textsubscript{1-50}</td>
</tr>
</tbody>
</table>

Table 3: Secondary Codes Assignment
2.5 Assignment of Codes to Satellites

2.5.1 Primary Code Assignment to Satellites
The E6-B and E6-C primary codes provided in A.3 and A.4 will be allocated to the space vehicle IDs (SVID) as follows:
- To SVID \( n \) (with \( n = 1 \) to 36) are assigned the corresponding E6-B and E6-C primary codes number \( n \).

2.5.2 Secondary Code Assignment to Satellites
The E6-C secondary codes provided in section 2.4.1 will be allocated to the space vehicle IDs (SVID) as follows:
- To SVID \( n \) (with \( n = 1 \) to 36) is assigned the secondary code CS100\(_n\) (i.e. CS100\(_1\) to SVID 1).
### 3 Annex A – Galileo E6-B/C Primary Codes

#### A.1 Introduction

This annex provides basic information regarding the Galileo primary codes for components E6-B and E6-C.

#### A.2 Hexadecimal Coding Convention

Generally, one hexadecimal symbol (0 to 9, A to F) corresponds to four succeeding code chips. The leftmost code-chip corresponds to the first code-chip in time, and the rightmost code-chip corresponds to the last code-chip in time. The first group is built with the first four code-chips, the second group with the fifth to eighth code-chips, etc.

For primary codes whose length is not divisible by four, as is the case for E6-B/C primary codes, the last hexadecimal symbol is built from the last group of code-chips, filled up with zeros at the end in time (to the right) to reach a final length of 4 binary symbols.

<table>
<thead>
<tr>
<th>Components</th>
<th>Primary Code Length (chips)</th>
<th>Number of Hexadecimal Symbols</th>
<th>Number of Filled up Zeros</th>
<th>Number of Defined Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>E6-B</td>
<td>5115</td>
<td>1279</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>E6-C</td>
<td>5115</td>
<td>1279</td>
<td>1</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 4: Primary Code-Length and Hexadecimal Representation Characteristics
A.3 E6-B Primary Codes

The E6-B primary codes are provided below and embedded within current document ("A3_E6B.TXT").

E6-B_Code_No_01;

E6648AA5EFF097A170377EF98DF0CB81AE8D914EE497093ADB94FF4B3916EE562A4CAF
4A5A0497216065F8FFEB26C949D7C80AB87AD2F7DBDBFB8AFF9B9151D02D9AA33F6C
83ECFB8DE21B77E793A9E759E7A37E6D330395DF9380E8E8F0AA511E0FCE8EB06501
98FA7C693FFFFF197EE4249EF295B578E5147D9E86EBC10197B37656B6EF6C9
AA8B200B20DEE54FDB1872BA3393450F20B8A7AC84A9F945938E13434BD3076087
F3CA165AFB9FE968624B831BA4B67A6CAF6D7B216BAC53F71FAF1A13580DBFBB
56DD5558559AE2541FFDED2ADF6125D73F116006A715596001D153BD091C8D454
0342B910219EA64B77A7A245E4E70DAD545790C3D59DF2F8C8ACEBC6DB2F17ADBAF78
DB09C9A2EB811599A3911C8EBF8D42A0BC2A50D0D8D7C318BE96699708255F125D
FAF153766F6DD32726B3FBE174484CA9485848DC519667505A0A220E84B1AF
9F08FP8BC1D10595973C0F347F52595D1EEF00C399D9A6EF140B879465E07F487A8
CE9B8EC34EB219AC63C01127520C8E2DF2A7090AC754976B8DA5C51F18001ED995
18DC659B57463B93026013A6DEFF5C4DF19E6E6C6AAFD01D6E397EC75381497
66B930990F9DOA98D2F9606233858CD696913088876272B3C6FC27288BE7D258CE
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A.4 E6-C Primary Codes

The E6-C primary codes are provided below and embedded within current document ("A4_E6C.TXT")

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E6-C_Code_No_32;
4 Annex B – Authorisation Concerning the E6-B/C SIS Technical Note IPRs

By practicing, using or copying the E6-B/C SIS Technical Note or any portion thereof, YOU ACCEPT ALL TERMS AND CONDITIONS OF THIS AUTHORISATION, including in particular the limitations on use, warranty and liability. If you are acting on behalf of a company or other legal entity, you represent and warrant that you have the legal authority to bind that company or legal entity to these terms and conditions. IF YOU DO NOT HAVE SUCH AUTHORITY OR IF YOU AND/OR THAT COMPANY OR LEGAL ENTITY DO NOT WISH TO BE BOUND TO THESE TERMS DO NOT PRACTICE, USE OR COPY THE E6-B/C SIS IPRs OR ANY PORTION THEREOF.

The European Union (hereinafter “the EU”) is the owner of, holds the right over, and/or controls the intellectual and industrial property rights to, the E6-B/C SIS Technical Note IPRs listed in Annex B.12.

In the interest of facilitating and encouraging the adoption of technologies using the EU GNSS, the EU represented by the European Commission hereby issues the Authorisation (as defined in Section 1 below) concerning the E6-B/C SIS Technical Note IPRs towards any individual, corporation or other natural or legal person worldwide, subject to the terms, conditions and limitations described herein. The Authorisation is non-exclusive and royalty-free.

B.1 Definitions

The terms below printed with an initial capital letter shall have herein the following meanings unless the context otherwise requires:

"Authorisation" – shall mean the EU’s covenant that it shall not assert, seek to assert and/or enforce any of the rights and claims it has in relation to the E6-B/C SIS Technical Note IPRs against the practicing, using or copying thereof, subject to the terms, conditions and limitations described herein.

"Authorised Person" – shall mean the natural or legal person that benefits from the Authorisation under the terms, conditions and limitations described herein.

"Export Controls" – shall mean any international or national export control law or regulation applicable to activities carried out under the E6-B/C SIS Technical Note IPRs that regulates, embargoes or sanctions the export of products, information and/or technology in any way.

"Field of Use" – shall mean research and development on, manufacturing, commercialisation, distribution, sale, supply and maintenance of, the Products.

"E6-B/C SIS TN " – shall mean the present E6-B/C Codes Technical Note in the version as of the date of issuance of this Authorisation and/or, as the case may be, as modified after that date.

"E6-B/C SIS TN Copyright" – shall mean the copyright on and to the E6-B/C SIS TN document.
and/or its content.

"E6-B/C SIS TN IPRs" – shall mean the intellectual or industrial property rights listed in Annex B.12, including Patents and E6-B/C SIS TN Copyright. For the purpose of this Authorisation, E6-B/C SIS TN IPRs also include any and all intellectual or industrial property rights and other proprietary rights on and to the Technical Data of the E6-B/C SIS TN.

"Patents" – shall mean any and all patents and/or patent applications mentioned in Annex B.12, including the inventions described and claimed therein as well as any divisions, continuations, continuations-in-part, re-examinations and reissues thereof, and any patents issued from said patent applications.

"Products" – shall mean software, electronic devices (e.g., chipsets and receivers) and Value Added Services that are developed – directly or indirectly – by the Authorised Person and that are making use of the High Accuracy Service and Commercial Authentication Service on E6-B/C Signal.

"Technical Data of the E6-B/C SIS TN" – shall mean the data related to: Galileo Signal characteristics, the Galileo Spreading Codes characteristics, Galileo Message Structure, Message Data Contents and E6 Memory Codes, as such terms are used in the E6-B/C SIS TN.

"Territory" – shall mean, with respect to each E6-B/C SIS TN IPRs individually, and subject to Export Controls, the territories covered by said individual E6-B/C SIS TN IPR.

"Value Added Services" – shall mean any service developed based on, or using, the E6-B/C SIS TN IPRs and delivering different or additional capabilities with respect to the OS Signal.

### B.2 Ownership of Rights

Ownership in and/or control of the E6-B/C SIS TN IPRs shall remain with the EU and therefore, no title of any intellectual property right on the E6-B/C SIS TN IPRs under the Authorisation shall be acquired by the Authorised Person, whether by implication, estoppel or otherwise. The Authorisation shall be withdrawn and shall not apply against any individual, corporation or other natural or legal person that challenges the validity of any of the E6-B/C SIS TN IPRs or participates in such a challenge, or encourages or supports any third parties in such a challenge.

### B.3 Scope of the Authorisation

The scope of the Authorisation is limited to the Territory and Field of Use. The Authorisation is non-transferable and non-licensable. The Authorised Person shall not assign, transfer or license any of the rights granted under the Authorisation.


The commercial exploitation of the Products in the Field of Use under the Authorisation shall be under the sole responsibility of the Authorised Person.
The Authorised Person shall not state or imply in any promotional material or elsewhere that the Products were developed by, are used by or for or have been approved or endorsed by the EU or by the owner of any of the Patents.

Pursuant to the Authorisation, the EU's covenant not to assert covers the following activities of the Authorised Person:

a) the use of the Technical Data of the E6-B/C SIS TN, including their integration and incorporation into any Products, by the Authorised Person or by third parties contractors used by the Authorised Person for manufacturing said Products;

b) the storage of the Technical Data of the E6-B/C SIS TN, provided the source is acknowledged;

c) the reproduction of the E6-B/C SIS TN, in whole or in part, its distribution and its publication for non-commercial not-for-profit purposes and scale without amending the document or adding any element;

d) providing links to the EU website where the document is published, provided the source is acknowledged, in accordance with the copyright notice in the E6-B/C SIS TN;

e) This list is exhaustive. No other activity shall benefit from the Authorisation. The practice of any of the E6-B/C SIS TN IPRs outside of the scope of the Authorisation shall be deemed in breach of the intellectual property rights of the EU.

Subject to the foregoing, the Authorised Person shall have the discretion to select distributors and otherwise determine the commercial strategy, including all channels of distribution, regarding the distribution and sale of the Products in the Territory.

The Authorised Person shall be solely responsible for (but failure to strictly abide by a) and b) below shall not be in contradiction with the Authorisation):

a) exercising its activities hereunder strictly in compliance with all laws and regulations of each of the countries in which such activity takes place;

b) compliance with all Export Controls.

**B.4 Additional Intellectual Property Rights and Maintenance of Patent Rights**

The EU reserves the right, in the course of the Authorisation term, to acquire ownership or control of additional intellectual or industrial property rights related to the E6-B/C Signal. In that case, the EU may update Annex B.12 accordingly. The EU however takes no obligation to communicate the acquisition of or licence to additional intellectual or industrial property rights related to the E6-B/C Signal.

The Authorisation shall automatically cover any such additional intellectual or industrial property rights included in the updated Annex B.12, without the need to amend the Authorisation. The EU shall have no obligation, duty or commitment whatsoever to:

a) maintain the E6-B/C SIS TN IPRs in force, whether in full or partly, nor shall it be obliged to communicate any decision thereto to the Authorised Person;

b) furnish any assistance, technical information or know-how to the Authorised Person.
B.5 Duration and Termination

With respect to each of the E6-B/C SIS TN IPRs, the Authorisation shall be valid for the whole duration of said E6-B/C SIS TN IPR insofar as the terms, conditions and limitations of the Authorisation are respected.

The Authorisation shall terminate automatically upon any act of the Authorised Person that violates any of the terms, conditions or limitations of the Authorisation, unless the European Union agrees to the remedial measures proposed by the Authorised Person and the latter are implemented in reasonable time set by the Union.

In the event of a termination of the Authorisation for whatever reason, the Authorised Person shall:

a) immediately discontinue the development or use of the Products or any other activity covered under the scope of the Authorisation as defined in Section 4 above; and

b) except in cases of termination for violation of this Authorisation by the Authorised Person, as a temporary exception to point a. above, have the right, during 6 (six) months after the termination of the Authorisation, to sell all remaining Products in stock or in process of being manufactured at that date, or within that term of 6 (six) months, have terminated, finished and/or fulfilled all agreements which have been entered into prior to the termination.

The Authorisation and its validity shall not be influenced by the fact that one or more of the E6-B/C SIS TN IPRs whose practice, use or copy is authorised hereunder should finally be declared not granted or invalid.

B.6 Warranties and Liability

The Authorisation is issued under the E6-B/C SIS TN IPRs as they are. The EU makes no representation and no express or implied warranty, and assumes no liabilities as to any matter whatsoever concerning the E6-B/C SIS TN IPRs, including as to:

a) the condition, the patentability and/or validity and enforceability of the E6-B/C SIS TN IPRs;

b) the freedom to practice, use or copy the E6-B/C SIS TN IPRs, to perform the activities that benefit from the Authorisation, or to develop, commercialise or exploit the Products;

c) any third party’s prior rights to use the E6-B/C SIS TN IPRs and/or to enjoin the activities that benefit from the Authorisation;

d) the dependency of the E6-B/C SIS TN IPRs on third parties’ intellectual or industrial property rights;

e) the merchantability or fitness for a particular purpose of the E6-B/C SIS TN IPRs and/or the Products.

To the full extent allowed by law, all warranties, whether expressed or implied, for any use of E6-B/C SIS TN IPRs or related to the Products, including on product liability, are excluded, and the EU shall not be held liable for any claim or damage related thereto, being asserted by the Authorised Person or any third party with respect to the activities of the Authorised Person under the Authorisation.
**B.7 Infringements by Third Parties**

The EU shall have the discretionary right and faculty to decide whether or not to bring an action for any infringements of the E6-B/C SIS TN IPRs in the case where a third party does not benefit from the Authorisation, even where the EU has been duly informed about such alleged infringement by the Authorised Person. The EU shall have no obligation whatsoever to bring such an action nor to notify any decision thereto to the Authorised Person.

**B.8 Action for Infringement Brought by Third Parties**

The Authorised Person shall defend itself and at its own expenses, and bear all the consequences, including the payment of damages and attorney fees, against any claim, suit or proceeding made or brought against the Authorised Person and arising from its activities under the Authorisation, including any claim, suit or proceeding for infringement of third parties' rights as a result of the Authorised Person's practice, use or copy of the E6-B/C SIS TN IPRs or commercialisation of Products. The Authorised Person shall notify the EU without undue delay about any such claim, suit or proceeding. The EU may, at its sole discretion, agree to provide the Authorised Person with any assistance which the EU considers to be appropriate, but the EU shall not in any way be obliged to do so. If the EU decides to defend either the Authorised Person or the E6-B/C SIS TN IPRs, the Authorised Person shall collaborate with the EU and provide the EU with all the assistance necessary to such defence.

**B.9 Permits**

The necessary steps for obtaining all permits and licences required for the activities under the Authorisation, under the laws and regulations in force at the place where said activities of the Authorised Person are provided or to be provided, shall be the exclusive responsibility of the Authorised Person.

**B.10 Applicable Law and Dispute Resolution**

The Authorisation shall be governed by European Union law, complemented where necessary by the law of Belgium. Except for the right of the EU and/or the Authorised Person to apply to a court of competent jurisdiction for a temporary restraining order or a preliminary injunction to prevent irreparable harm, any dispute, controversy or claim arising under, out of or relating to the Authorisation and any subsequent amendments thereof, including, without limitation, its validity, binding effect, interpretation, performance, breach or termination shall be submitted to mediation in accordance with the WIPO Mediation Rules. The place of mediation shall be Brussels. The language to be used in the mediation shall be English. If, and to the extent that, any such dispute, controversy or claim has not been settled pursuant to the mediation within sixty (60) days of the commencement of the mediation, it shall, upon filing of a Request for Arbitration by either the EU or the Authorised Person, be referred to and finally determined by arbitration in accordance with the WIPO Expedited
Arbitration Rules. Alternatively, if, before the expiration of said period of sixty (60) days, either the EU or the Authorised Person fails to participate or to continue to participate in the mediation, the dispute, controversy or claim shall, upon the filing of a Request for Arbitration by the participating EU or Authorised Person, be referred to and finally determined by arbitration in accordance with the WIPO Expedited Arbitration Rules. The arbitral tribunal shall consist of three arbitrators. The place of arbitration shall be Brussels. The language used in the arbitration proceedings shall be English.

In any action to enforce the Authorisation, the prevailing entity shall be entitled to recover its reasonable attorney’s fees, court costs and related expenses from the other entity.

**B.11 Miscellaneous**

The provisions of the Authorisation are severable in the sense that the invalidity or unenforceability of any provision of the Authorisation that is not fundamental to its performance shall not affect the validity and/or enforceability of the remaining provisions hereof. Such invalidity or unenforceability of such non-fundamental provision shall not relieve the Authorised Person of its obligations under the remaining provisions of the Authorisation.

This Authorisation fully and exclusively states the scope of the authorisation concerning the E6-B/C SIS TN IPRs that the EU wishes to issue.

The EU reserves the exclusive right to amend the Authorisation upon due public notice.

The fact that the Authorisation is self-executing and that the EU requires no signature of the Authorisation shall not be considered a waiver and shall have no effect on the binding character of the terms, conditions and limitations of the Authorisation upon the practice, use or copy of the E6-B/C SIS TN IPRs by the Authorised Person.
**B.12 Annex**

Annex B.12 is appended to and is an integral part of the Authorisation.

**List of E6-B/C SIS TN Related Intellectual Property Rights**

<table>
<thead>
<tr>
<th>IPR</th>
<th>Name of IPR</th>
<th>Application number</th>
<th>Date of filing</th>
<th>Date of publication</th>
<th>Applicant</th>
<th>Owner</th>
<th>Designated Countries</th>
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<tbody>
<tr>
<td>1</td>
<td>Patent Method for providing assistance data to a mobile station of a satellite positioning system</td>
<td>PCT/EP2006/068177</td>
<td>07-11-06</td>
<td>18-05-07</td>
<td>GSA</td>
<td>EU</td>
<td>Australia Canada China Europe designated countries: (AT, BE, CH, CZ, DE, DK, ES, FI, FR, GB, GR, HU, IE, IT, LU, NL, PL, PT, RO, SE, TR) India Japan Russia S. Korea USA</td>
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<tr>
<td>2</td>
<td>Patent Method and generator for generating a spread-spectrum signal</td>
<td>12559874</td>
<td>15-09-09</td>
<td>25-03-10</td>
<td>GSA</td>
<td>EU</td>
<td>USA</td>
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<tr>
<td>3</td>
<td>Patent Chaotic spreading codes and their generation</td>
<td>PCT/EP2007/063080</td>
<td>30-11-07</td>
<td>05-06-08</td>
<td>GSA</td>
<td>EU</td>
<td>Australia Brazil Canada China Europe designated countries: (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,</td>
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</table>

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E6-B/C Codes Technical Note, Issue 1, January 2019
<table>
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<th>IPR</th>
<th>Name of IPR</th>
<th>Applicaton number</th>
<th>Date of filing</th>
<th>Date of publication</th>
<th>Applicant</th>
<th>Owner</th>
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<td>E6-B/C Codes Technical Note</td>
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<td>5</td>
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<td>Spreading codes for a satellite navigation system (concerning memory codes)</td>
<td>PCT/EP2004/014488</td>
<td>17-12-04</td>
<td>22-06-06</td>
<td>ESA</td>
<td>EU</td>
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<td>6</td>
<td>Patent</td>
<td>Spreading codes for a satellite navigation system (concerning secondary codes)</td>
<td>PCT/EP2005/007235</td>
<td>01-07-05</td>
<td>11-01-07</td>
<td>ESA</td>
<td>EU</td>
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</table>
C.1 Definitions

The under mentioned terms printed with an initial capital letter shall have the meanings stated below. Any reference to the plural shall include the singular and any reference to the singular shall include the plural.

"Authorisation" shall mean the EU's covenant that it shall not assert, seek to assert and/or enforce any of the rights and claims it has in relation to the Galileo Trade Marks against the use thereof, subject to the terms, conditions and limitations described herein.

"Authorised Person" shall mean the natural or legal person that benefits from the Authorisation under the terms, conditions and limitations described herein.

"EU Stakeholders" shall mean the European Space Agency (ESA), the European GNSS Agency (GSA) and other international organisations with activities in GNSS, any of the EU, ESA or GSA contractors and subcontractors at any tier working in the Galileo programme, operator(s) of the Galileo satellite navigation system, EU Member States and their institutions and bodies, including national space agencies.

"Field of Use" shall mean the use of one or more of the Galileo Trade Marks by the Authorised Person in order to signify that the respective Products make use of the GNSS Services provided by the EU and/or the EU Stakeholders. Reference to the Galileo Trade Marks may be made by any means associated with the marketing of the Products, including but not limited to packaging, instructional and promotional materials.

"Galileo Trade Marks" shall mean any and all trade mark registrations and applications owned by EU and/or the EU Stakeholders, anywhere in the world consisting of or incorporating the word GALILEO, including without limitation the trade mark applications and registrations set out in Annex C.
“GNSS” shall mean Global Navigation Satellite System.


“GNSS Services” shall mean the following activities contemplated by the GNSS Regulation:

a) open service (OS), which is free of charge to the user and provides positioning and synchronisation information intended mainly for high-volume satellite navigation applications;

b) contribution, by means of Galileo open service signals and/or in cooperation with other satellite navigation systems, to integrity-monitoring services aimed at users of safety-of-life applications in compliance with international standards;

c) commercial service (CS) for the development of applications for professional or commercial use by means of improved performance and data with greater added value than those obtained through the open service1;

d) public regulated service (PRS) restricted to government-authorised users, for sensitive applications which require a high level of service continuity, free of charge for the Member States, the Council, the Commission, EEAS and, where appropriate, duly authorised Union agencies; this service uses strong, encrypted signals;

e) contribution to the search and rescue support service (SAR) of the COSPAS-SARSAT system by detecting distress signals transmitted by beacons and relaying messages to them.

“Products” shall mean software, electronic devices (e.g., chipsets and receivers) and Value Added Services that are developed and marketed – directly or indirectly – by the Authorised Person.

“Value Added Services” shall mean any service delivering different or additional capabilities with respect to signals broadcasted by the infrastructure developed under the European GNSS Programmes.

C.2 Ownership of Rights

Ownership of the Galileo Trade Marks shall remain with the EU and therefore, no title of any intellectual property right on the Galileo Trade Marks under the Authorisation shall be acquired by the Authorised Person.

The Authorisation shall be withdrawn and shall not apply to any natural or legal person that challenges the validity or enforceability of any of the Galileo Trade Marks or participates in such a challenge, or encourages or supports any third parties in such a challenge.

1 According to the Commission Implementing Decision (EU) 2017/224 of 8 February 2017 setting out the technical and operational specifications allowing the commercial service offered by the system established under the Galileo programme to fulfil the function referred to in Article 2(4)(c) of Regulation (EU) No 1285/2013 of the European Parliament and of the Council CS comprises two major improvements – the High Accuracy Service and Commercial Authentication Service.
C.3 **Scope of the Authorisation**

The scope of the Authorisation is limited to the Field of Use.

The Authorisation is non-transferable and non-licensable. The Authorised Person shall not assign, transfer or license any of the rights granted under the Authorisation.

The Authorised Person shall use the Galileo Trade Marks in the Field of Use under the Authorisation in a manner so as not to harm the security interests of the EU or its Member States as set forth in article 13 and article 17 of the GNSS Regulation.

The commercial exploitation of the Products in the Field of Use under the Authorisation shall be under the sole responsibility of the Authorised Person.

The Authorised Person shall not state or imply in any promotional material or elsewhere that the Products were developed by, are used by or for or have been approved or endorsed by the EU or the EU Stakeholders.

Pursuant to the Authorisation, the EU's covenant not to assert covers the use of the Galileo Trade Marks in the context of the development and marketing of any Products, including its use on the Products themselves and on their packaging, instructional and promotional materials, by the Authorised Person or by third party contractors used by the Authorised Person for manufacturing said Products, only in the Field of Use;

In addition to the limitations described above, the Authorised Person shall not:

a) Use the Galileo Trade Marks or any confusingly similar sign as, or as part of, the stand-alone brand name or sub-brand name of any of its Products, or as the stand-alone registered or trading name of any corporate entity or business. For the avoidance of doubt, this does not prevent the Authorised Person from affixing one or more Galileo Trade Marks to the packaging of their Products;

b) Apply for or obtain registration of any trade mark which consists of, comprises, or is confusingly similar to the Galileo Trade Marks;

c) Claim any interest or rights to the Galileo Trade Marks, other than the rights explicitly granted by the EU under the Authorisation.

By way of example, acceptable use of the Galileo Trade Marks under the Authorisation and in the Field of Use would include "the new [Product brand name] satnav powered by Galileo" or "the [Product brand name] Galileo receiver". "A Galileo receiver" or "Galileo receivers" shall also be considered acceptable as referential uses. Unacceptable uses would include "a new satnav by Galileo" and "the Galileo receiver".

The Authorised Person shall be solely responsible for exercising its activities hereunder strictly in compliance with all laws and regulations of each of the countries in which such activity takes place.

C.4 **Additional Intellectual Property Rights and Maintenance of Rights**

The EU reserves the right, in the course of the Authorisation term, to acquire ownership or control of additional trademarks related with the sign Galileo. In that case, the EU may update
Annex 1 accordingly. The EU however takes no obligation to communicate the acquisition of additional trade mark rights to the Authorised Person.

The Authorisation shall automatically cover any such additional trade mark rights included in the updated Annex 1, without the need to amend the Authorisation. The EU shall have no obligation, duty or commitment whatsoever to:

   a) maintain the Galileo Trade Marks in force nor shall it be obliged to communicate any decision thereto to the Authorised Person;
   b) provide any assistance, technical information or know-how to the Authorised Person.

C.5 Duration and Termination

The Authorisation shall be valid as long as the Galileo Trade Marks remain valid and in force, insofar as the terms, conditions and limitations of the Authorisation are respected.

The Authorisation shall terminate automatically upon any act of the Authorised Person that violates any of the terms, conditions or limitation of the Authorisation.

The Authorisation and its validity shall not be influenced by the fact that one or more of the Galileo Trade Marks whose use is authorised hereunder should finally be declared not granted or invalid.

C.6 Warranties and Liability

The Authorisation is issued under the Galileo Trade Marks as they are. The EU makes no representation and no express or implied warranty, and assumes no liabilities as to any matter whatsoever concerning the Galileo Trade Marks, including as to the validity and enforceability of the Galileo Trade Marks;

To the full extent allowed by law, all warranties, whether expressed or implied, for any use of the Galileo Trade Marks are excluded. The EU shall not be held liable for any claim or damage related thereto, being asserted by the Authorised Person or any third party with respect to the activities of the Authorised Person under the Authorisation.

C.7 Action for Infringement Brought by Third Parties

The Authorised Person shall defend itself and at its own expenses, and bear all the consequences, including the payment of damages and attorney fees, against any claim, suit or proceeding made or brought against the Authorised Person and arising from its activities under the Authorisation, including any claim, suit or proceeding for infringement of third parties’ rights as a result of the Authorised Person’s use of the Galileo Trade Marks or marketing of the Products. The Authorised Person shall notify the EU without undue delay about any such claim, suit or proceeding. The EU may, at its sole discretion, agree to provide the Authorised Person with any assistance which the EU considers to be appropriate, but the EU shall not in any way be obliged to do so. If the EU decides to defend either the Authorised Person or the Galileo Trade Marks, the Authorised Person shall collaborate with the EU and provide the EU with all the assistance necessary to such defence.
C.8 Applicable Law and Dispute Resolution

The Authorisation shall be governed by European Union law, complemented where necessary by the law of Belgium.

The courts of Brussels have exclusive jurisdiction over any dispute regarding the interpretation, application or validity of the Contract.

C.9 Miscellaneous

The provisions of the Authorisation are severable in the sense that the invalidity or unenforceability of any provision of the Authorisation that is not fundamental to its performance shall not affect the validity and/or enforceability of the remaining provisions hereof. Such invalidity or unenforceability of such non-fundamental provision shall not relieve the Authorised Person of its obligations under the remaining provisions of the Authorisation.

This Authorisation fully and exclusively states the scope of the authorisation concerning the Galileo Trade Marks.

The EU reserves the exclusive right to amend the Authorisation upon due public notice.

The fact that the Authorisation is self-executing and that the EU requires no signature of the Authorisation shall not be considered a waiver and shall have no effect on the binding character of the terms, conditions and limitations of the Authorisation upon the use of the Galileo Trade Marks by the Authorised Person.
**C.10 Annex - Galileo Trade Marks**

Annex C.10 is appended to and is an integral part of the Authorisation.

<table>
<thead>
<tr>
<th>Mark</th>
<th>Territory</th>
<th>Trademark number</th>
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<td>GALILEI</td>
<td>EU</td>
<td>004546561</td>
</tr>
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<td>GALILEO</td>
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<td>EU</td>
<td>002742237</td>
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## 6 Annex D – List of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARNS</td>
<td>Aeronautical Radionavigation Services</td>
</tr>
<tr>
<td>BOC</td>
<td>Binary Offset Carrier</td>
</tr>
<tr>
<td>CBOC</td>
<td>Composite Binary Offset Carrier modulation</td>
</tr>
<tr>
<td>CDMA</td>
<td>Code Division Multiple Access</td>
</tr>
<tr>
<td>C/NAV</td>
<td>Commercial Navigation message (provided in E6-B signal)</td>
</tr>
<tr>
<td>cps</td>
<td>Chips Per Second</td>
</tr>
<tr>
<td>CRC</td>
<td>Cyclic Redundancy Check</td>
</tr>
<tr>
<td>ECEF</td>
<td>Earth-Centred, Earth-Fixed</td>
</tr>
<tr>
<td>EGNOS</td>
<td>European Geostationary Navigation Overlay Service</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FEC</td>
<td>Forward Error correction</td>
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<tr>
<td>GGTO</td>
<td>Galileo/GPS Time Offset</td>
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<tr>
<td>GNSS</td>
<td>Global Navigation Satellite System</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>GST</td>
<td>Galileo System time</td>
</tr>
<tr>
<td>GTRF</td>
<td>Galileo Terrestrial Reference Frame</td>
</tr>
<tr>
<td>ICD</td>
<td>Interface Control Document</td>
</tr>
<tr>
<td>IPR</td>
<td>Intellectual Property Rights</td>
</tr>
<tr>
<td>Mcps</td>
<td>Mega Chips Per Second</td>
</tr>
<tr>
<td>mHz</td>
<td>Megahertz</td>
</tr>
<tr>
<td>MSB</td>
<td>Most Significant Bit</td>
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<tr>
<td>N/A</td>
<td>Not Applicable</td>
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<tr>
<td>Symbol</td>
<td>Description</td>
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<td>OS</td>
<td>Open Service</td>
</tr>
<tr>
<td>PSK</td>
<td>Phase-Shift Keying</td>
</tr>
<tr>
<td>Q</td>
<td>Quadrature Signal component</td>
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<tr>
<td>QPSK</td>
<td>Quadrature Phase-Shift Keying</td>
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<td>RF</td>
<td>Radio Frequency</td>
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<td>RNSS</td>
<td>Radionavigation-Satellite Services</td>
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<tr>
<td>SAR</td>
<td>Search-and-Rescue Service</td>
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<td>SIS</td>
<td>Signal-In-Space</td>
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<tr>
<td>sps</td>
<td>Symbols Per Second</td>
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<td>SV</td>
<td>Space Vehicle</td>
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<td>SVID</td>
<td>Space Vehicle Identifier</td>
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<td>TOT</td>
<td>Time Of Transmission</td>
</tr>
<tr>
<td>TN</td>
<td>Technical Note</td>
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<tr>
<td>UTC</td>
<td>Coordinated Universal Time</td>
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<tr>
<td>WIPO</td>
<td>World Intellectual Property Organization</td>
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