



المملكة الأردنية الهاشمية
هيئة تنظيم قطاع الاتصالات
دائرة إدارة الطيف الترددي

APPLICATION FORM
FOR
Aeronautical Mobile Satellite Service (AMSS) Authorization

هيئة تنظيم قطاع الاتصالات

هاتف: 5862020-(6-962)
فاكس: 5863641/42-(6-962)
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| |
|---|
| ملاحظات هامة |
| ١) قبل إكمال تعبئة هذا الطلب يرجى قراءة جميع المعلومات الواردة في الملحقات رقم ٣ و ٤ و ٥ بدقة . |
| ٢) يرجى إكمال تعبئة الملحقين رقم ١ و ٢ طباعة (BLOCK CAPITAL Typescript). |
| ٣) المعلومات التقنية المقدمة في هذا الطلب سوف يتم استخدامها للتنسيق مع مستخدمي الطيف الترددي الآخرين. |
| ٤) يرجى الاحتفاظ بنسخة من الطلب المعبأ كاملاً. |

في حالة طلب وثائق داعمة أخرى يمكن إرسالها الى دائرة إدارة الطيف الترددي، هيئة تنظيم قطاع الاتصالات ص.ب ٨٥٠٩٦٧ عمان، الرمز البريدي: ١١١٨٥ الأردن. هاتف: ٠٠٩٦٢٦٥٨٦٢٠٢٠ فاكس: ٠٠٩٦٢٦٥٨٦٣٦٤٢

| معلومات عن مقدم الطلب | Applicant Information |
|--|---|
| اسم الشركة Company name | |
| اسم الشخص المعني في الشركة (كما هو في جواز السفر) Contact Person Name (as in Passport) | |
| رقم جواز السفر Passport No. | |
| الجنسية Nationality | |
| رقم ملف/موافقة هيئة الاعلام المرني والمسموع Audio Visual Commission File/Approval No. | |
| مجال(مجالات) عمل الشركة Principle Activity(ies) (as registered in Audio Visual Commission.) | |
| العنوان Address | |
| عنوان إرسال الفواتير (في حالة اختلافه عن عنوان المراسلة) Billing Address (if it is different from Correspondence Address) | |
| رقم الهاتف Telephone No. | |
| رقم الفاكس Fax No. | |
| البريد الالكتروني Email | |
| الموقع الالكتروني Web Address | |
| هل تم دفع رسوم الطلب؟ | <input type="radio"/> لا <input type="radio"/> نعم |
| معلومات الطلب Application Information | |

| | |
|---|--|
| <p>رقم الملحق :</p> <div style="border: 1px solid black; width: 200px; height: 30px; margin: 10px auto;"></div> | <p style="text-align: center;"><u>متطلب اجباري</u></p> <p>وصف النظام الغاية من استعمال النظام (إرفاق وثائق داعمة كملحق، مثل مخطط يبين الأجزاء الرئيسية للنظام)</p> <p><u>System Description</u> Proposed Use of System (Attach supporting documents, such as Block diagram, in an Annex)</p> |
|---|--|

الجزء (أ): معلومات الطلب (خاص بالتعديلات)

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

في حالة التعديلات، يرجى ذكر رقم الموافقة (Authorization No.):

| | |
|--|---|
| | <p>يرجى ذكر الاسم الكامل للشركة أو السلطة (Authority) المراد إصدار التحويل أو الموافقة لها</p> |
| | <p>عنوان مقدم الطلب</p> |
| | <p>العنوان المشابه (في حال اختلف عن العنوان أعلاه) Address for correspondence (if different from above)</p> |

الجزء (ب): تفاصيل مركز تحكم و مراقبة (رصد) الشبكة
Network Control And Monitoring center Details

| | | | |
|-----|-----|-----|---|
| سنة | شهر | يوم | في أي تاريخ سيتم تشغيل الخدمة المتنقلة الساتلية للطيران (AMSS)؟ |
|-----|-----|-----|---|

المحطة الفضائية المرتبطة (Associated Space Station)

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

خط الطول المداري (Nominal Orbit Longitude)

| Degrees | | E/W |
|---------|--|-----|
| | | |

عنوان مركز تحكم و مراقبة (رصد) الشبكة أو المركز المكافئ (EQUIVALENT FACULTY)

| Longitude | | | |
|-----------|-----|-----|-----|
| Degrees | E/W | Min | Sec |
| | | | |

| Latitude | | | |
|----------|-----|-----|-----|
| Deg | N/S | Min | Sec |
| | | | |

الإحداثيات الجغرافية (Geographical)
(Coordinates)

| | |
|--|---|
| | رقم الهاتف للاتصال في حالة الطوارئ Telephone contact number in the event of an emergency |
|--|---|

AMSS ANTENNA Details

الجزء (ج): مواصفات هوائي خدمة (AMSS)

CHARACTERISTICS OF THE TRANSMITTING ANTENNA

مواصفات الهوائي المرسل

صنع (MAKE): _____

طراز (MODEL): _____

| | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

نوع الهوائي (TYPE)

_____ meters

حجم الهوائي (SIZE)

أقصى قيمة للكسب المتناحي (MAXIMUM ISOTROPIC GAIN)

| | | | |
|-----|--|--|--|
| dBi | | | |
| | | | |

عرض الحزمة (BEAMWIDTH)

| | | | | | |
|---------|--|--|--|--|--|
| Degrees | | | | | |
| | | | | | |

| | |
|--|--|
| | |
|--|--|

مخطط الإشعاع للهوائي (ANTENNA RADIATION PATTERN DIAGRAM) كما في المرفق رقم:

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

مخطط الإشعاع، يرجى ذكر مرجع المخطط أو تزويد مخطط توضيحي

خصائص مشتركة مع قائمة الترددات المخصصة التالية

CHARACTERISTICS COMMON TO THE FOLLOWING LIST OF ASSIGNED FREQUENCIES

| تردد المرسل المستجيب أو التردد النقطي TRANSPONDER OR SPOT FREQ | طبيعة الخدمة NATURE OF SERVICE | التردد المخصص ASSIGNED FREQUENCY | صنف المحطة CLASS OF STATION |
|---|--------------------------------------|--|--------------------------------|
| | | | |

مع كل نوع من التشكيل (modulation) يرجى توضيح كل من: قدرة الذروة الغلافية الكلية (total peak envelope power) وكثافة القدرة لكل هيرتز عند مدخل الهوائي (power density per Hz supplied to the input of the antenna).

| نوع الإرسال DESIGNATION OF EMISSION | قدرة الذروة الكلية TOTAL PEAK POWER | القيمة القصوى لكثافة القدرة MAXIMUM POWER DENSITY |
|--|---|--|
| | +/- dBW | +/- dBW |

CHARACTERISTICS OF THE RECEIVING ANTENNA

مواصفات الهوائي المستقبل

أقصى قيمة للكسب المتناحي (MAXIMUM ISOTROPIC GAIN)

| | | | |
|-----|--|--|--|
| dBi | | | |
| | | | |

عرض الحزمة (BEAMWIDTH)

| | | | | | |
|---------|--|--|--|--|--|
| Degrees | | | | | |
| | | | | | |

درجة حرارة الضوضاء للنظام المستقبل (Receiving system noise temperature (degrees Kelvin))

kelvin

مخطط الإشعاع للهوائي (ANTENNA RADIATION PATTERN DIAGRAM) كما في المرفق رقم:

مخطط الإشعاع، يرجى ذكر مرجع المخطط أو تزويد مخطط توضيحي

تردد الاستقبال (RECEIVE FREQUENCY)

(_Hz)

الجزء (د): مواصفات التشكيل Modulation characteristics (where applicable)

لأي نوع من أنواع التشكيل، يرجى ذكر خصائص تشتيت الطاقة (energy dispersal)

التشكيل الترددي (FM)

للموجة الحاملة المشكلة بطريقة التقسيم الترددي الهاتفي الأساسي متعدد القنوات أو عن طريق الإشارة التي يمكن تمثيلها بالتردد الهاتفي الأساسي متعدد القنوات. اذكر القيمة الدنيا و القيمة القصوى للنطاق الأساسي، أيضا الانحراف الترددي للنطاق الأساسي و تردد الاختبار بدلالة التردد الأساسي؟

For a carrier frequency modulated by a frequency division multi-channel telephone baseband (FDM-FM) or by a signal that can be represented by a multi-channel telephony baseband frequency. What are the lowest and highest frequencies of the baseband and the rms frequency deviations of the baseband and the test tone as a function of baseband frequency?

القيمة الدنيا _____ القيمة القصوى _____ الانحراف _____

تشكيل الطور (PM)

للموجة الحاملة مشكلة الطور بالإشارة، يرجى ذكر معدل (bit rate) و عدد الأطوار (number of phases)

معدل _____ عدد الأطوار _____

لكل أنواع التشكيل، يرجى ذكر التفاصيل الخاصة بدراسة التداخلات (التنسيق)

For all types of modulation, please provide such particulars as may be useful for an interference study i.e. co-ordination.

| | | |
|---|--|-------------------------------------|
| Technical Documents (One set is to be submitted) | | الوثائق الفنية (تقدم كمجموعة واحدة) |
| المعلومات الفنية ومواصفات الوحدات الوظيفية (العنوان المراد تعيينه) | | |
| Technical Data & Specifications of the Functional Units (title to be Specified) | | |
| | أ- المرسل Transmitter | |
| | ب- الهوائي Antenna | |
| | ج- مرشح الترددات الراديوية RF Filter | |
| | يرجى وضع إشارة (X) في حالة إرفاق الوثائق التالية | |
| | <input type="checkbox"/> صورة مخطط إشعاع الهوائي Antenna Radiation Diagram <input type="checkbox"/> صورة مخطط توهين مرشح الترددات الراديوية RF Filter Attenuation Diagram | |

الجزء (هـ): الاتصال مع الشخص المعني في الشركة (contact person)

في حال طلب هيئة تنظيم قطاع الاتصالات أية معلومات إضافية عن هذا الطلب، الاتصال مع الشخص المنعني:

الاسم (الصفة الفنية):

رقم الهاتف:

رقم الفاكس:

الاسم (الصفة الإدارية):

رقم الهاتف:

رقم الفاكس:

البريد الإلكتروني:

أشهد بأنني أمثل المتقدم بالطلب كما هو مبين في الحقل أدناه ولقد قمت بدراسة المعلومات التقنية ووجدتها صحيحة. وأقر بأن جميع المعلومات الواردة في هذا الطلب صحيحة وذات مصداقية. وأعلم بأن موافقة هيئة تنظيم قطاع الاتصالات على طلبي هذا مبنية على المعلومات الواردة في هذا الطلب وتعتبر موافقة الهيئة لاجية في حالة وجود خطأ في هذه المعلومات.

الاسم (يرجى طباعته)

Name (Please print or type)

التوقيع و التاريخ

Signature & Date

| | |
|---|-----------------|
| المسمى الوظيفى بالشركة: | رقم الهاتف: |
| Telephone No. | Position |
| العنوان البريدى (يرجى كتابة الرمز البريدى أيضا) | |
| Address (include ZIP Code) | |

أقرار (يجب تعينته من جميع مقدمي الطلب) Declaration - to be signed by all Applicants

أشهد بأنني قرأت الملحقات المرفقة رقم (١) و (٢) والمتعلقة بالإشعاع الراديوي الكثيف.
وأقر بأن المعلومات المقدمة في هذا الطلب واية معلومات أخرى مرفقة هي صحيحة وكاملة بناء على المعلومات المتوفرة لدي.

الاسم والتوقيع:-----
المسمى الوظيفي:-----
التاريخ:-----

- هل : أكملت تعبئة جميع الأجزاء في هذا الطلب والمتعلقة بك؟
 أرفقت الصور (diagrams) المطلوبة؟
 وقعت الإقرار؟
 تم الاحتفاظ بنسخة من الطلب المعبأ كامل؟

ملحق رقم (١)

إقرار

**** يجب تعبئته ****

يرجى استكمال بقية الطلب قبل التوقيع على هذا الإقرار

بناء على المعلومات المتوفرة لدي أقر بأن جميع المعلومات المقدمة والواردة في هذا الطلب صحيحة، لقد قرأت الملاحظات في هذا الطلب و الشروط و البيانات و سأقوم بإرفاق كافة المعلومات الضرورية (المرفقات) مع هذا الطلب.

أنا (الاسم و اللقب) _____
الوظيفة في الشركة: _____
باسم و بالنيابة عن _____ (اسم الشركة) _____ و عنوانها _____

أقر بأن الجهاز ذو المواصفات التالية:
المصنّع: _____ رقم الطراز: _____
استورد من: _____
الشركة: _____
عنوانها: _____
البلد: _____

في حال الرغبة الاتصال مع الشخص المعني في الشركة، اسم الشخص : _____
الهاتف: _____ الفاكس: _____
البريد الإلكتروني: _____

يتطابق مع المواصفات: _____ و _____
و _____ و _____

و أؤكد و ألتزم بأن جهاز الاتصال الراديوي أعلاه في هذا الطلب هو الذي سيتم تسويقه و/أو تشغيله و/أو بيعه في الأردن بعد الحصول على الموافقة من الهيئة، و سأقوم بطلب الموافقة النوعية مرة أخرى إذا كان المصدر في البيانات أعلاه للجهاز الراديوي مختلف عما تم الإقرار به.
أقر أيضا بأن العينة (العينات) إذا طلبت من الهيئة للموافقة النوعية لغايات الفحص للجهاز الراديوي ستكون مماثلة ومطابقة تماما لكافة المواصفات أعلاه.

الاسم و التوقيع و بالنيابة عن (اسم الشركة): _____

ملحق رقم (2)

اقرار السلامة

**** يجب تعبئته ****

أنا (نحن) نقر بأنني(أنا) أملك(نملك) نتائج فحص السلامة المتعلقة بجهاز الاتصال الراديوي المذكور في هذا الطلب كما هو مشار في هذه الصفحة.

أنا (نحن) أعلن على مسؤوليتي الخاصة بأن جهاز الاتصال الراديوي مطابق لمواصفات السلامة المعتمدة المبينة أدناه:

_____ و
_____ و

| |
|--|
| معلومات جهاز الراديوي |
| الشركة المصنعة: _____ رقم الطراز: _____ |
| استورد من: _____ الشركة: _____ |
| العنوان: _____ |
| البلد: _____ |

_____ (الاسم و اللقب)
المسمى الوظيفي بالشركة
باسم و بالنيابة عن _____ (اسم الشركة) الموجودة في
العنوان _____

الاسم و التوقيع باسم و بالنيابة عن _____ التاريخ _____

هذا النموذج (نموذج الطلب) يهدف لتزويد الهيئة بالمعلومات التي تساعد على تقييم ودراسة الطلب، وإذا ورد فيه أي نص أو بند أو مواصفة... الخ لم يستند إلى قرارات أو تعليمات أو كتب رسمية صادرة أو معتمدة لدى الهيئة فهو غير ملزم للهيئة، وفي جميع الأحوال فإن كل ما ورد في هذا النموذج ملزم لمقدمه وغير ملزم للهيئة.

ملحق رقم (٣)

(١) معلومات تقنية عن الخدمة المتنقلة الساتلية للطيران

١-١: مقدمة

تعتبر الخدمة المتنقلة الساتلية للطيران من ضمن خدمات الاتصالات الساتلية وتخضع للمعايير والقوانين المتفق عليها دولياً والمعتمدة من الاتحاد الدولي للاتصالات.

- هذا الطلب مخصص لمقدمي طلب الحصول على تردد راديوي لخدمة AMSS .
- قبل إكمال تعبئة الطلب يجب أن يكون مقدم الطلب على علم بقوانين الطيران المدني (Civil Aviation) المتضمنة في قانون الطيران المدني.
- يجب تعبئة هذا الطلب ونسختين من هذا الطلب مع الملحقات والمرفات المطلوبة.
- إن دقة المعلومات المقدمة من قبل مقدم الطلب ودقة الأسئلة المجابة تسرع من عملية دراسة الطلب وأي نقص في المعلومات والمتطلبات في هذا الطلب يزيد من تأخير عملية دراسة هذا الطلب.

٢-١: معلومات عن الطلب

- أ- يجب أن يكتب اسم مقدم الطلب بشكل يطابق ما هو وارد في موافقة سلطة الطيران المدني. يجب تزويدنا باسم الشارع أو رقم صندوق البريد المستخدم من قبل مقدم الطلب وذلك حتى تتمكن من ارسال الرد.
- ب- تقدم كل موافقة لخدمة متنقلة ساتلية للطيران جديدة مع طلب رخصة الترددات الابتدائي لهذه المحطة ويرفق تقرير أو شهادة ملكية للمحطة على هيئتها الحالية وغير المعدلة وذلك على صورة ملف سبق مراجعته وتدقيقه من قبل الهيئة. يرسل تقرير الملكية أو شهادة الملكية بشكل منفصل الى صندوق بريد هيئة تنظيم قطاع الاتصالات.
- ج- يجب توقيع هذا الطلب شخصياً من قبل مقدم الطلب إذا كان فرداً، ومن قبل أحد الشركاء إذا كان المتقدم عبارة عن شركة، ومن قبل رئيس إذا كان المتقدم اتحاد أو نقابة ومن قبل محامي مقدم الطلب في حالة عدم وجود مقدم الطلب بالاردن أو في حالة وجود إعاقة جسدية تمنعه من توقيع نفسه، وفي هذه الحالة يجب على محامي مقدم الطلب بيان الأسباب التي منعت مقدم الطلب من توقيع نموذج الطلب بنفسه، بالإضافة لذلك إذا كانت هذه الأسباب مبنية على اعتقادات المحامي وليس بناءً على معرفته يجب عليه توضيح الأسباب التي دعت الى ادعائه صدق هذه الاعتقادات.
- د- لا داعي لتعبئة المعلومات المطلوبة في هذا الطلب والموجودة أصلاً في ملفات الهيئة بشرط: (١) المعلومات موجودة في ملف طلب آخر أو أحد طلبات الهيئة والموثقة في ملفات الشركة أو من بنوب عنها، (٢) تحديد رقم الملف الموجود فيه المعلومات أو تاريخ التوثيق أو رقم طلب الهيئة، (٣) بعد ذكر المرجع من قبل مقدم الطلب.

Currently, there is no specific description of the Aeronautical Mobile Satellite Service incorporated in the Telecoms law. However, the following is the International Telecommunications Union description of the AMSS (ITU – R Recommendation F.113 (08/92)):

1.2.1.1 System description

An aeronautical mobile-satellite system is a two-way voice and data communication with aircraft operating within the field-of-view of a satellite.

An aeronautical mobile-satellite system consist of three basic elements:

- *Aircraft earth stations (AES)* : Transmitting and receiving stations located on board aircraft capable of communicating with the satellite and interfacing with other terminals within the aircraft.
- *Aeronautical ground earth stations (GES)*: Fixed terrestrial transmitting and receiving stations communicating with the satellite and interfacing with terrestrial public and private telecommunication networks. For the purpose of this Recommendation the acronym GES will be used to denote an aeronautical ground earth station to avoid confusion over identical acronyms, although it is recognized that *Radio Regulation 77* defines this as an aeronautical earth station (see Note).

Note: Fixed terrestrial transmitting and receiving stations jointly providing a combination of maritime, land and aeronautical mobile services are commonly referred to as land earth stations (LES) in the INMARSAT system.
- *Satellite* : Providing communication between AESs and GESs.

AMSS System is designed to support four types of communications as follows:

- i) Aeronautical passenger communications (APC);
- ii) Aeronautical administrative communications (AAC);
- iii) Aeronautical operational control (AOC) communications; and
- iv) Air traffic services (ATS) communications.

- ٣-٢-١: **المدة الزمنية لإصدار الموافقة على الخدمة:** شهرين تقريبا لإصدار الرخصة للخدمة.
- ٤-٢-١: **صيغة الموافقة/الرخصة:** تكون الرخصة فقط للخدمة المتنقلة الساتلية للطيران AMSS
- ٥-٢-١: **شروط التجديد:** يجب على حامل الموافقة التقدم بطلب تجديدها قبل أسبوعين من تاريخ انتهاء الموافقة الحالية.
- ٦-٢-١: **الرسوم:**
- * رسوم الطلب ١٠٠ دينار تدفع مرة واحدة، رسوم طلب التجديد ٥٠ دينار لكل سنة بالإضافة إلى أن هناك ١٠٠٠ دينار تدفع سنويا تدفع للهيئة قبل موعد التجديدي.
- * أي تاخير في دفع الرسوم قبل موعد انتهاء الموافقة يعرض الموافقة للإلغاء. إن دفع الرسوم بعد انتهاء مدة الموافقة ينتج عنه غرامة 2% عن كل شهر بعد تاريخ الانتهاء.
- ٧-٢-١: **الحقوق والواجبات المترتبة على الموافقة:** على الحاصلين على الموافقة تقديم الخدمة ضمن الشروط الواردة في الرخصة فقط.
- ٨-٢-١: **سحب وتغيير الموافقة:**
- * **السحب:** عندما يتم الإخلال بالواجبات المترتبة على الموافقة.
- * **التغيير:** حسب قانون الاتصالات واية شروط أخرى للموافقة.
- ٩-٢-١: **تحويل الموافقة من جهة لأخرى:** غير مسموحة إطلاقا.

ملحق رقم (٤)

شروط عامة

- يحق لمقدم الطلب الحاصل على الموافقة تشغيل محطات أرضية متنقلة على متن الطائرة وتعمل بالاتصال مع الساتل المذكور في الطلب ضمن الحزم الترددية المذكورة في الجدول رقم (١) ويمكن تشغيل هذه الخدمة باتجاهين ضمن الأراضي الأردنية وأيضا في الأجواء فوق المياه الإقليمية الأردنية. إن الرخصة الممنوحة لمقدم الطلب خاضعة للشروط التالية:
- (١) يجب عدم تقديم الخدمة خلال هبوط أو إقلاع الطائرة.
- (٢) يجب تقديم الخدمة على متن الطائرة فقط عند عبورها الأجواء الأردنية.
- (٣) يجب ألا تسبب الخدمة أي تشويش أو تداخلات مع الخدمات الأخرى الموضحة في الجدول الوطني للترددات سواء كانت على المستوى الوطني (حكومي أو غير حكومي) أو على المستوى الدولي وفي حال تسببت الخدمة بأي تشويش فيجب على مزودها التوقف عن تقديمها.
- (٤) يجب على مقدم الخدمة الغير مطابقة للنطاقات الترددية المخصصة قبول أي تداخلات تنتج عن الخدمات التي تستخدم النطاقات الترددية الواردة في الجدول (١)
- (٥) لا يجوز استخدام هذه الخدمة في عملية التحك بالاتصالات الطائرة.
- (٦) يجب الالتزام بأي قيمة للقدرة المشعة المكافئة المتناحية والتي يتم تحديدها وفق معايير الاتحاد الدولي للاتصالات.
- (٧) لا يسمح بالبدء بتشغيل الخدمة إلا بعد أن تقوم الهيئة بالتنسيق لضمان توافق الخدمة مع النطاقات والحزم الترددية المخصصة.
- (٨) المحطة الأرضية للطيران (AES) في خدمة AMSS المشغلة في طائرة أردنية مسجلة تحتاج إلى رخصة منفصلة.
- (٩) كل جهاز طرفي متنقل في هذه الخدمة يجب:
- أن يكون قادرا على الأقل على استقبال أوامر قرار الإرسال أو تعطيل الإرسال (enable transmission or disable transmission) من مركز مراقبة وتحكم الشبكة.
- أن يوقف الإرسال عند استلام أمر تغيير المعلمة (parameter change) لأن استمرار الإرسال يؤدي إلى التأثير على السواتل الأخرى خلال عملية التغيير ويمكن للجهاز الإرسال مرة أخرى فقط عند استلام أمر قرار الإرسال.
- أن يتم تحديده من قبل مركز المراقبة في حال تعطل أحد مهامه.
- (١٠) للهيئة الحق في إلغاء الموافقة على الخدمة جوبا وفوق المياه الإقليمية ويجب على مشغل الخدمة التوقف فورا عن تقديمها في حال طلبت منه الهيئة ذلك.
- (١١) للهيئة الحق في تغيير الموافقة وستعلم صاحب الموافقة بذلك قبل تاريخ التجديد (التعديل).

3. Technical Specifications

3.1 Scope

This document specifies certain minimum technical performance requirements of Aircraft Earth Station (AES) equipment with both transmit and receive capabilities for provision of aeronautical mobile satellite service (AMSS) , in the frequency bands given in table 1.

| Mode of Operation | Frequency Band (GHZ) |
|-------------------|----------------------|
| AES transmit | 14,00 to 14,50 |
| AES receive | 10,70 to 11,70 |
| AES receive | 12,50 to 12,75 |

Table 1: Frequency bands for the AES equipment specified in the present document

NOTE: The AESs are operating in one or more frequency ranges of the Fixed and Mobile-Satellite Services.

• **In general, the adopted AESs should have the following characteristics:**

- The AESs are specifically designed to be installed and operate on board aircrafts.
- The AESs could consist of a number of modules from the antenna subsystem to the user interface.
- The AESs use a linear polarization
- The AESs use a digital modulation techniques.
- The AESs operate through a GSO satellite at least 3° away from any other geostationary satellite operating in the same frequency band and covering the same area.
- The AESs adopt directional antennas with tracking satellites capability.
- The AESs operate as a part of satellite network that is used for the distribution and/or exchange of information between users.
- The AESs are controlled and monitored by a Network Control Facility (NCF).

• **The technical requirements in the present document are in two major categories**

First :

In terms of the emission limits

It is intended to provide a protection to other radio services and systems from any possibility of generating harmful interference during the normal operation of the AESs.

Second:

In terms of AESs Control and Monitoring Functions (CMF)

It is adopted to protect other radio services and systems from unwanted transmissions resulting from the AESs. The CMF in each AES should be capable of complying to the received commands from the Network Control Facility (NCF) of its supporting satellite network.

The present document applies to the AESs with their ancillary equipments and its various ports, and when operated within the boundary limits of the operational environmental profile declared by the manufacturer. The present document is intended to mostly cover the provisions of Directive 1999/5/EC (R&TTE

Directive) article 3.2, which states that "... radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

3.2 Technical requirement specifications

3.2.1 General

The transmissions from the AES to the Satellite in the 14,00 GHz to 14,50 GHz band (up link transmissions) fall under a secondary allocation to the Mobile-Satellite Service (MSS) according to the ITU-R recommendations. Accordingly, Up-link transmissions should not cause any harmful interference to those services operating on a primary allocation basis like: Fixed-Satellite Service (FSS). Moreover, such kind of services with a secondary allocation basis cannot claim protection from harmful interference caused by the other services operating on a primary allocation basis. In relation to Radio Astronomy (RA) service in band 14,47 GHz to 14,5 GHz (whose allocation is on a secondary basis), the transmissions from AES equipment shall not cause unacceptable interference to RA sites operating within this frequency band.

3.2.1.1 Environmental profile

The technical requirements of the present document apply under the environmental profiles for operation of the equipment (EME and IME), which shall be declared by the manufacturer. The equipment (EME and IME) shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profiles and for the environmental conditions corresponding to the same type of equipment (please submit the necessary documents that shows the applicable international compliances together with the applicable standards).

3.2.2 Conformance requirements

3.2.2.1 General

The applicant shall declare the aircraft model for which the AES is designed. Under operational conditions an AES may dynamically change the occupied bandwidth (Bo) and other transmission parameters (e.g. FEC, modulation, symbol rate) of the transmitted signal. For each occupied bandwidth an EIRP_{max} and a nominated bandwidth (Bn) shall be declared by the applicant. The following specifications apply to the AES for each occupied bandwidth and other transmission parameters.

3.2.2.2 Spurious radiation

3.2.2.2.1 Justification

To limit the level of interference to terrestrial and satellite radio services.

3.2.2.2.2 Specification

The following specifications apply to AES transmitting at EIRP values up to and including EIRP_{max}.

- The AES shall not exceed the limits for the radiated interference field strength stated in table 2. over the frequency range that fall between 30 MHz and 1 000 MHz .

| Frequency range (MHz) | Quasi-peak limits (dB μ V/m) |
|-----------------------|----------------------------------|
| 30 to 230 | 30 |
| 230 to 1 000 | 37 |

Table 2: Limits of radiated field strength at a test distance of 10 m in a 120 kHz bandwidth

The lower limits shall apply at the transition frequency.

- When the AES is in the "Transmission disabled" state, the off-axis spurious Equivalent Isotropic Radiated Power (EIRP) from the AES, in the measurement bandwidth, shall not exceed the limits stated in table 3, for all off-axis angles greater than a minimum off-axis angle (θ_{min}) declared by the manufacturer:

| Frequency band (GHZ) | EIRP limit (dBpW) | Measurement bandwidth (KHz) |
|----------------------|-------------------|-----------------------------|
| 1,0 GHz to 10,7 | 48 | 100 |
| 10,7 GHz to 21,2 | 54 | 100 |
| 21,2 GHz to 40,0 | 60 | 100 |

Table 3: Limits of off-axis spurious EIRP - "Transmission disabled" state

| Frequency band (GHZ) | EIRP limit (dBpW) | Measurement bandwidth |
|----------------------|-------------------|-----------------------|
| 1,0 to 3,4 | 49 | 100 kHz |
| 3,4 to 10,7 | 55 | 100 kHz |
| 10,7 to 13,75 | 61 | 100 kHz |
| 13,75 to 14,0 | 95 (see note) | 10 MHz |
| 14,5 to 14,75 | 95 (see note) | 10 MHz |
| 14,75 to 21,2 | 61 | 100 kHz |
| 21,2 to 40,0 | 67 | 100 kHz |

NOTE: This limit may be exceeded in a frequency band which shall not exceed 50 MHz, centred on the carrier frequency, provided that the on-axis EIRP density at the considered frequency is 50 dB below the maximum on-axis EIRP density of the signal (within the nominated bandwidth) expressed in dBW/100 kHz.

Furthermore, this limit may be exceeded by a factor of $12 \log (h / 2\text{km})$ (dB), where the h is the height in km of the aircraft above mean sea level and $h > 2\text{km}$, for equipment put on the market before 1 January 2004.

The lower limits shall apply at the

transition frequency.

- When the AES is in the "Transmission enabled" state, i.e. in the carrier-on and carrier-off states, the off-axis spurious EIRP density from the AES, outside the nominated bandwidth, shall not exceed the limits in table 4, for all off-axis angles greater than a minimum off-axis angle (θ_{min}) declared by the manufacturer:

Table 4: Limits of off-axis spurious EIRP "Transmission Enabled" state

The lower limits shall apply at the transition frequency.

- In the frequency band 28,0 GHz to 29,0 GHz, for any 20 MHz band within which one or more spurious signals exceeding the above limit of 67 dBpW are present, then the power of each of those spurious signals exceeding the limit shall be added in watts, and the sum shall not exceed 78 dBpW.

For AES designed to simultaneously transmit multiple carriers, the limits apply to the sum of the EIRPs of all the simultaneously transmitted carriers.

For Table 3 and 4 the elevation angle of the AES main beam axis with respect to its local horizontal plane shall not be lower than the following minimum elevation angle (ϵ_{\min}) of the AES main beam axis:

$$\epsilon_{\min} = \max(\epsilon_{0\text{km}}, \theta_{\min}) - [\max(\epsilon_{0\text{km}}, \theta_{\min}) - \epsilon_{2\text{km}}] \cdot (h / 2\text{km}) \quad \text{for } h \leq 2\text{km}$$

$$\epsilon_{\min} = \theta_{\min} - \arccos(R_e / (R_e + h)) \quad \text{for } h > 2\text{km}$$

where:

- R_e mean Earth Radius in km (6378.14 km);
- h is the AES altitude, above the mean sea level, in km. The value of h is set to 0km when the AES is on the ground;
- $\epsilon_{0\text{km}}$ is the minimum elevation angle in degrees permitted on the ground : 7° everywhere except in locations where transmissions at lower elevation angles are permitted by the local administrations;
- $\epsilon_{2\text{km}} = \theta_{\min} - \arccos(R_e / (R_e + 2\text{ km})) = \theta_{\min} - 1.435^\circ$.
- The elevation angles are positive above the local horizontal plane and negative below it.

3.2.2.3.1 Justification

To limit the level of interference to satellite radio services.

3.2.2.3.2 Specification

3.2.2.3.2.1 "Carrier-on" state

The following specification applies to the AES transmitting at EIRP values up to EIRP_{max}.

- In the 14,0 GHz to 14,5 GHz band the EIRP spectral density of the spurious radiation and outside a bandwidth of 5 times the occupied bandwidth centred on the carrier centre frequency shall not exceed:

bandwidth. $4 - K$ dBW in any 100 kHz

- In a bandwidth of 5 times the occupied bandwidth centred on the carrier centre frequency, the EIRP spectral density of the spurious radiation, outside the nominated bandwidth, shall not exceed:

$18 - K$ dBW in any 100 kHz bandwidth.

K is the factor that accounts for a reduction on the on-axis spurious radiation level in case of multiple AESs operating on the same frequency.

For AESs which are not expected to transmit simultaneously in a same carrier frequency band, the value of K is 0.

For AESs which are expected to transmit simultaneously in a same carrier frequency band with identical or different EIRPs, the value of K for each EIRP of the AES is given by the following formula :

$$K = -10 \log (EIRP/EIRP_{Aggregate})$$

where :

- EIRP is the on-axis EIRP of the AES within the nominated bandwidth and
- EIRP_{Aggregate} is the maximum on-axis aggregate EIRP within the nominated bandwidth of the AMSS system towards the satellite.

EIRP_{Aggregate} shall not be exceeded for more than 0,01 % of the time. The value of EIRP_{Aggregate} and the operational conditions of the AMSS network shall be declared by the applicant.

NOTE 1: The on-axis spurious radiations, outside the 14,0 GHz to 14,5 GHz band, are indirectly limited by [clauses 4.2.2.2](#). Consequently no specification is needed.

NOTE 2: Intermodulation limits inside the band 14,0 GHz to 14,5 GHz are to be determined by system design and are subject to satellite operator specifications.

For AES designed to transmit simultaneously several different carriers (multicarrier operation), the above limits only apply to each individual carrier when transmitted alone.

3.2.2.3.2.1 "Carrier-off" state and "transmission disabled" state

In the 14,0 GHz to 14,5 GHz band the EIRP spectral density of the spurious radiation (i.e. outside the nominated bandwidth) shall not exceed -21 dBW in any 100 kHz bandwidth.

3.2.2.4 Off-axis EIRP emissions density in the nominated bandwidth

3.2.2.4.1 Justification

To protect other operating satellite systems that are using the same frequency band.

3.2.2.4.2 Specification

The following specifications apply to the AES transmitting at EIRP values up to EIRP_{max}.

The maximum EIRP in any 40 kHz band in any direction ϕ degrees from the AES antenna main beam axis shall not exceed the following limits within 3° of the geostationary orbit:

$$\begin{array}{ll} 33 - 25 \log (\phi + \delta\phi) - H & \text{dB(W), where } 2,5^\circ \leq \phi + \delta\phi \leq 7,0^\circ \\ +12 - H & \text{dB(W), where } 7,0^\circ < \phi + \delta\phi \leq 9,2^\circ \\ 36 - 25 \log (\phi + \delta\phi) - H & \text{dB(W), where } 9,2^\circ < \phi + \delta\phi \leq 48^\circ \\ -6 - H & \text{dB(W), where } 48^\circ < \phi + \delta\phi \leq 180^\circ \end{array}$$

Where :

- ϕ is the angle, in degrees, between the main beam axis and the direction considered;
- The value of $\delta\phi$ (relative to the target satellite) is equal to the rms antenna pointing accuracy.
- For AESs designed to transmit always at EIRP_{max}, H (in dB) is the maximum number of AESs which may transmit at EIRP_{max} as declared by the manufacturer.

For any off-axis direction in the region outside 3° of the geostationary orbital arc, the above limits may be exceeded by no more than 9 dB.

The applicant shall declare the maximum on-axis EIRP corresponding to each range of main beam directions and the corresponding envelope of the EIRP density as a function of the off-axis angle. This envelope could also be the EIRP density mask given above. For each range of the main beam directions the above mask in clause 4.2.4.2 must not be exceeded. The AES shall be able to reduce its on-axis EIRP as required by the NCF in a CC when several AESs are transmitting simultaneously at the same carrier frequency.

3.2.2.5 Control and Monitoring Functions (CMF)

The following minimum set of CMF shall be implemented in AES in order to minimize the probability that they may originate unwanted transmissions that may give rise to harmful interference to other systems.

. Under any fault condition when the AES transmissions are being suppressed, the limits for carrier-off state shall apply.

3.2.2.5.1 Processor monitoring

3.2.2.5.1.1 Justification:

To ensure that the AES can suppress transmissions in the event of a processor subsystem failure.

3.2.2.5.1.2 Specification

The AES shall incorporate a processor monitoring function for each of its processors involved in the manipulation of its required traffic, and in the control and monitoring functions. The processor monitoring function shall detect any failure of the processor hardware and software.

In case of any faulty condition or event, the AES shall enter the carrier-off state within one second, if it was in the Transmission enabled state, and within 30 seconds it shall enter the carrier-off Transmission disable state until the processor monitoring function has determined that all fault conditions have been cleared.

3.2.2.5.2 Transmit subsystem monitoring

3.2.2.5.2.1 Justification

To ensure the correct operation of the transmit frequency generation subsystem, and to inhibit transmissions when the subsystem fail.

3.2.2.5.2.2 Specification

The AES shall monitor the operation of its transmit frequency generation subsystem. In case of any faulty condition or event, no later than 5 seconds the AES shall enter the carrier-off Transmission-disabled state until the transmit subsystem monitoring function has determined that all fault conditions have been cleared.

3.2.2.5.3 Power-on/Reset

3.2.2.5.3.1 Justification

To demonstrate that the AES achieves a controlled non-transmitting state following the powering of the unit, or the occurrence of a reset made by a local operator when this function is implemented.

3.2.2.5.3.2 Specification

During and following "power on" or a manual reset when this function is implemented, the AES shall remain in the in the Transmission-disabled state.

3.2.2.5.4 Control Channel (CC) reception

3.2.2.5.4.1 Justification

To ensure that the AES cannot transmit unless it correctly receives the CC messages from the NCF.

3.2.2.5.4.2 Specification

- Without correct reception of the CC messages from the NCF, the AES shall remain in the Transmission-disabled state.
- When in the Transmission enabled state, the AES shall enter the Transmission disabled state immediately after a period not exceeding 30 seconds without correct reception of the CC messages from the NCF.

3.2.2.5.5 Network control commands

3.2.2.5.5.1 Justification

These requirements ensure that the AES is capable of:

- retaining a unique identification in the network and transmitting it upon the reception of an appropriate request;
- receiving and executing commands which are received from the NCF through its dedicated CC.

3.2.2.5.5.2 Specification

The AES shall hold, in non-volatile memory, its unique identification code in the network. The AES shall be capable of receiving through its CC dedicated commands (addressed to the AES) from the NCF, and which contain:

- A transmission enable commands including the transmission parameters (at least the EIRP, the data rate and carrier centre frequency). the AES is authorized to transmit only when a transmission enable command is received. After power-on or reset, the AES shall remain in the Transmission disabled state until it receives a transmission enable command. For systems where no transmission enable command is expected after power-on or reset, the AES may only transmit initial bursts.
- A transmission disable commands:
Once a transmission disable command is received, within 1 second the AES shall enter and shall remain in the carrier-off Transmission disabled state until the transmission disable command is superseded by a subsequent transmission enable command.
- Identification request:
The AES shall be capable of transmitting its identification code upon the reception of an identification request.

3.2.2.5.6 Initial burst transmission

Restrictions on the initial burst transmissions are necessary to limit disturbance to other services.

3.2.2.5.6.1 General

Restrictions on the initial burst transmissions are necessary to limit disturbance to other services.

3.2.2.5.6.2 Specification

For AMSS systems where no transmission enable command is foreseen, the AES may transmit initial bursts without request from the AES in the "Initial phase" state. These initial bursts follow the following formats:

- The duty cycle of the burst retransmission shall not exceed 0,2 %.
- Each burst shall not carry more than 256 data bytes excluding the burst preambles and the FEC coding bits.
- The initial burst shall be transmitted at an EIRP up to EIRPmax.

The requirements for the Transmission enable state shall apply during the transmission of each initial burst..

3.2.2.6 Power Flux Density at the Surface of the Earth

3.2.2.6.1 General

The limitation of the Power Flux Density (PFD) at the surface of the Earth shall be controlled either by the AES itself, or by the NCF.

3.2.2.6.2 Power flux density limits in the 14,0 GHz to 14,50 GHz frequency band

3.2.2.6.2.1 Justification

In Europe, some countries operate Fixed Service (FS) links in the band 14,25 GHz to 14,50 GHz (shared band with FSS) on a primary basis, and Radio Astronomy Service (RAS) in the band 14,47 GHz to 14,5 GHz (shared with the FSS) on a secondary basis.

In other countries outside Europe FS links may operate in other parts of the 14,0 GHz to 14,5 GHz band on a primary basis, and Radio Astronomy Service (RAS) in the band 14,47 GHz to 14,5 GHz on a secondary basis .

Based on the above, there is a requirement for protection of FS systems in the band 14,0 to 14,50 GHz and RAS sites in the band 14,47 GHz to 14,5 GHz from in-band and out-band emissions of AES operating in the band 14,0 GHz to 14,5 GHz on a secondary basis. The specification of protection of FS systems and RAS is based on the Power Flux Density (PFD) limits per AES.

The PFD requirement for protection of FS systems is applicable when the AES is in line of sight with a country employing such FS systems and could be relaxed if the operator of the AES network has an agreement with the Administration of that country

The PFD requirement for protection of specific RAS sites is applicable when the AES is in line of sight of the specific RAS sites.

the applicant is required to declare the minimum requirement for a NCF operating the AES and for the purpose of the PFD limitation.

3.2.2.6.2.2 Specification 1: mode of PFD limitation

Two modes of limitation may be implemented for this PFD limitation :

1. the "partially remote controlled mode" where the NCF determines that the PFD must be limited and regularly transmits to the AES the necessary information for the determination and the update of the AES transmission parameters, by the AES itself,
2. the "full remote controlled mode" where the NCF determines that the PFD must be limited and regularly transmits all the necessary transmission parameters to the AES.

At least one of these two modes shall be implemented within the AES. The applicant shall declare :

- the modes of limitation which are implemented within the AES.
- the AES interfaces involved in the PFD limitation :
- the list of relevant parameters which are collected by the AES for the transmission parameter determination by the AES and the NCF (e.g. the aircraft altitude, latitude, longitude, attitude),
- the list of these relevant parameters which are used by the AES for the transmission parameter determination,
- the list of these relevant parameters which are transmitted by the AES to the NCF for the transmission parameter determination,
- the list of the transmission parameters which are received by the AES from the NCF for the transmission parameter determination,
- for the collected relevant parameters, the AES interface (s), including the protocols, the timing, the ranges of the values, the speed of the variations and the required accuracies,
- for the relevant parameters transmitted to the NCF, the AES interface with the NCF, including the protocols and the timing,
- for the transmission parameter received from the NCF, the AES interface with the NCF, including the protocols and the timing.
- These declared AES interfaces shall be in accordance with the user documentation.

3.2.2.6.2.3 Specification 2 : Location where to limit the PFD

- When the AES is operating in the frequency band from 14,0 GHz to 14,5 GHz and within the line-of-sight of the territory of an Administration where the Fixed Service networks are operating in this frequency band, the PFD produced at the surface of the Earth by emissions from the AES shall be limited as specified in specification 3a. The territory of Administrations where Fixed Service networks are operating in this frequency band are defined by the ITU Radio Regulations footnote 5.505, 5.508, 5.508a and 5.509a

- When the AES is operating in the frequency band from 14,0 GHz to 14,5 GHz and within the line-of-sight of the RAS site operating in the frequency band 14.47 GHz and 14.5 GHz, the PFD produced at the surface of the Earth by emissions from the AES shall be limited as specified in specification 3b. The Administrations where RAS sites are operating in this frequency band are defined by the ITU Radio Regulations footnote 5.504b and 5.504c.
- For an AES which determines partially where to limit the PFD, based on its location, the AES shall be able to determine where to limit the PFD with the accuracy declared by the applicant.
- For AMSS networks where the NCF determines completely or partially where to limit the PFD, based on the AES location, the collection of the relevant parameters by the AES and the exchange of information between the AES and the NCF shall be sufficient for the NCF to determine where to limit the PFD with the accuracy declared by the applicant and to inform in time the AES to limit the PFD.
- The determination of the locations where a PFD limitation is necessary, for the protection of the FS or RAS or both, shall take into account the inaccuracy of the AES location and of the country borders or RAS specific sites in the data base used either by the AES or the NCF, as declared by applicant.

3.2.2.6.2.4 Specification 3 : PFD limitation

- **Specification 3a**
When the AES PFD at the surface of the Earth must be limited, for the protection of FS in the band 14,25 GHz to 14,5 GHz, then the PFD at the surface of the Earth shall not exceed the PFD limits of Annex B of ITU-R Rec. M.1643 (Geneva 2003) [7]. This specification 3a applies in the band 14,25 GHz to 14,5 GHz when the AES is operating in the 14.0-14.5 GHz.
- **Specification 3b**
When the AES PFD at the surface of the Earth must be limited, for the protection of RAS sites in the band 14,47 GHz to 14,5 GHz, then the PFD at the surface of the Earth shall not exceed the PFD limits of Annex C of ITU-R Rec. M.1643 (Geneva 2003) [7].

This specification 3b applies in the band 14,47 GHz to 14,5 GHz when the AES is operating in the 14.0-14.5 GHz.

- **Specification 3c**
The above specifications 3a and 3b apply for any AES altitude relative to sea level within the operational altitude range of the AES as declared by the manufacturer. Outside this range of altitude the AES shall not transmit.
The above specifications 3a and 3b apply for the relevant parameters within the ranges declared by the applicant. In case of a relevant parameter out of the specified range AES shall not transmit.

For an AES which determines partially where to limit the PFD, based on its location, the AES shall be able to limit the

PFD as specified above taking into account the inaccuracies declared by the applicant.

For AMSS networks where the NCF determines completely or partially where to limit the PFD, based on the AES location, the collection of relevant parameters by the AES and the exchange of information between the AES and the NCF shall be such that with the information received from the NCF the AES is able to limit the PFD as specified above taking into account the inaccuracies declared by the applicant.

- **Specification 4 : Fault conditions**

Any collection or transmission of the relevant parameters to the NCF which have not been completed correctly within the required delay(s) declared by the manufacturer, shall be considered as a fault condition. In this case the AES shall enter the "Transmission disabled" state.

Any transmission parameter not received or not correctly received from the NCF within the required delay declared by the manufacturer shall be considered as a fault condition. In this case the AES shall enter the "Transmission disabled" state.

4 Definitions, symbols and abbreviations

4.1 Definitions:

For the purposes of this document, the following terms and definitions shall apply:

- **AMSS network:** comprises the AESs, geostationary satellite, LES and NCF.
- **Ancillary equipment:** equipment used in connection with an AES is considered as ancillary if the three following conditions are met:
 - i) the equipment is intended for use in conjunction with the AES to provide additional operational and/or control features (e.g. to extend control to another position or location); and
 - ii) the equipment cannot be used on a stand alone basis, to provide user functions independently of the AES; and
 - iii) the absence of the equipment does not inhibit the operation of the AES.
- **Applicant:** manufacturer/ service operator ,or his authorized representative in Jordan, or the person who is responsible for placing the apparatus on the market.

- **Carrier-off state:** state in which AES is when either it is authorized by the Network Control Facility (NCF) to transmit but when it does not transmit any signal, or when it is not authorized by the NCF to transmit.
- **Carrier-on state:** state in which AES is when it is authorized by the NCF to transmit and when it transmits a signal.
- **Control Channel (CC):** channel or channels by which AES receive control information from the NCF of their network.

NOTE: The CCs are not necessarily on separate RF channels from the RF channels carrying the user data streams.

- **EIRPmax:** maximum EIRP capability of the AES as declared by the applicant.
- **EIRPnom:** either:
 - i) EIRPmax;
 - ii) or, when uplink power control is implemented, the maximum required EIRP of the AES under clear sky condition as declared by the applicant

- **Environmental profile:** range of environmental conditions under which equipment within the scope of this document is required to comply with the provisions of this document.
- **Externally Mounted Equipment (EME):** those of the modules of the Installable Equipment (IE) which are intended to be mounted externally to the aircraft as stated by the manufacturer.
- **Installable Equipment (IE):** equipment which is intended to be fitted to an aircraft.

NOTE: An IE may consist of one or several interconnected modules.

- **Internally Mounted Equipment (IME):** those of the modules of the IE which are not declared by the manufacturer as EME are defined as IME.
- **Integral antenna:** antenna which may not be removed during the tests according to the applicant's statement.
- **LES:** an Earth station in the FSS or, in some cases, in the MSS, located at a specified fixed point or within a specified area on land to provide a feeder-link for the MSS.
- **Longitudinal angle:** angle from the AES zenith direction to any other direction.
- **Manufacturer:** authorized representative within the community, or the person responsible for placing the apparatus on the market.
- **Nominated bandwidth (Bn):** bandwidth of the AES radio frequency transmission is nominated by the applicant. The nominated bandwidth is centred on the transmit frequency and does not exceed 5 times the occupied bandwidth. The nominated bandwidth is within the 14,0 GHz to 14,5 GHz transmit frequency band.

NOTE: The nominated bandwidth is wide enough to encompass all spectral elements of the transmission which have a level greater than the specified spurious radiation limits. The nominated bandwidth is wide enough to take account of the transmit carrier frequency stability. This definition is chosen to allow flexibility regarding adjacent channel interference levels which will be taken into account by operational procedures depending on the exact transponder carrier assignment situation.

- **Occupied Bandwidth (Bo):** for a digital modulation scheme-the width of the signal spectrum 10 dB below the maximum in-band density.
- **Removable antenna:** antenna which may be removed during the tests according to the applicant's statement.
- **Response Channel (RC):** channel by which AES transmit monitoring information to the NCF
- **rms value :** the root mean square value of N measured values x_i is the square root of the sum of the square of the values x_i divided by N:

$$rms\ value = \sqrt{\frac{1}{N} \sum_{i=1}^N x_i^2}$$

- **Spurious radiation:** any radiation outside the nominated bandwidth.
- **Transmission disabled state:** state in which AES is not authorized to transmit by the NCF.
- **Transmission enabled state :** state in which AES is when it is authorized to transmit by the NCF.

4.2 Symbols

For the purposes of the present document, the following symbols apply:

- dBc Decibel ratio relative to the absolute carrier EIRP level
- dBi Decibel ratio relative to isotropic gain
- dBW Decibel ratio relative to 1 watt
- dBpW Decibel ratio relative to 1 pico watt
- dB μ V/m Square of the ratio of an electric field to 1 μ V/m, expressed in decibel 20 log (electric field / 1 μ V/m)

4.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

- AES: Aircraft Earth Station
- AMSS: Aeronautical Mobile Satellite Service
- Bo: Occupied Bandwidth
- Bn: nominated Bandwidth
- CC: Control Channel
- CISPR: International Special Committee on Radio Interference
- CMF: Control and Monitoring Function
- EIRP: Equivalent Isotropic Radiated Power
- EME: Externally Mounted Equipment
- EN: European Norm
- EN-RT: EN Requirements Table
- EUT: Equipment Under Test
- FS: Fixed Service
- FSS: Fixed-Satellite Service
- GSO: Geostationary Satellite Orbit
- HPA: High Power Amplifier
- IE: Installable Equipment
- IEEE: Institute of Electrical and Electronic Engineers
- IME: Internally Mounted Equipment
- IPR: Intellectual Property Rights
- ISO: International Organization for Standardization
- LES: Land Earth Station
- LNA: Low Noise Amplifier
- LNA/D: Low Noise Amplifier/Diplexer
- LRU: Line Replaceable Unit
- MES: Mobile Earth Station
- MSS: Mobile Satellite Service
- NCMC: Network Control and Monitoring Centre
- NCF: Network Control Facility
- PFD: Power Flux Density
- R&TTE: Radio and Telecommunications Terminal Equipment
- RAS: Radio Astronomy Service
- RC: Response Channel

- RF: Radio Frequency
- rms: root mean square
- SES: Satellite Earth Stations and System
- STE: Special Test Equipment
- STU: Satellite Terminal Unit

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