



National Radio Astronomy Observatory

520 Edgemont Road
Charlottesville, VA 22903 USA
434.296.0211 | Fax 434.296.0385
www.nrao.edu

27 August 2019

**Before the
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

In the Matter of)
)
Spectrum Horizons) ET Docket No. 18-21
)

**Comments of the National Radio Astronomy Observatory regarding operation of
Spectrum Horizons Experimental Radio Licenses under RR No 4.4**

I. Introduction

The National Radio Astronomy Observatory (NRAO), on its own behalf and that of its sister AUI-operated Green Bank Observatory (GBO)¹, is taking this opportunity to note some implications of Spectrum Horizons Experimental Radio Licenses operating under Article No. 4.4 of the International Radio Regulations, which may be issued as a result of the FCC's First Report and Order FCC 19-19 (the FR&O) concerning operations above 95 GHz.

**II. Obligations under RR No. 4.4 when making frequency assignments contrary to
the International Table of Frequency Allocations**

Frequency assignments contrary to the Table of Frequency Allocations and the Radio Regulations may operate under ITU-R Article No. 4.4 stating that "Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations."

Operations under RR No. 4.4 are explained in the ITU-R Rules of Procedure (RoP)². As noted in the minutes³ of the 16-20 July 2018 meeting of the Radio Regulations Board (RRB or "The Board"), Section 1 of the Rules of Procedure for Article No. 4.4 was revised with immediate effect on 18 July 2018, after due consideration and with input from administrations including the United States. The revised RoP for No. 4.4 are quoted in Annex 1 here.

¹ <https://greenbankobservatory.org/>

² <https://www.itu.int/pub/R-REG-ROP-2017>

³ https://www.itu.int/dms_pub/itu-r/md/00/cr/cir/R00-CR-CIR-0436!MSW-E.docx

As noted in Section 1.3 of the RoP:

“... In particular, administrations intending to authorize the use of spectrum under No. **4.4** still have the obligation, under Sections I and II of Article **9**, Nos. **11.2** and **11.3**, to notify to the Bureau “any frequency assignment if its use is capable of causing harmful interference to any service of another administration”.

Section 1.6 of the RoP states:

“The Board also concluded that administrations, prior to bringing into use any frequency assignment to a transmitting station operating under No. **4.4**, shall determine:

- a) That the intended use of the frequency assignment to the station under No. **4.4** will not cause harmful interference into the stations of other administrations operating in conformity with the Radio Regulations;
- b) What measures it would need to take in order to comply with the requirement to immediately eliminate harmful interference pursuant to No. **8.5**.

When notifying the use of frequency assignments to be operated under No. **4.4**, the notifying Administration shall provide a confirmation that it has determined that these frequency assignments meet the conditions referred to above in item a) and that it has identified measures to avoid harmful interference and to immediately eliminate such in case of a complaint.”

Section 1.5 of the RoP states:

“The Board considers that the determination of whether or not a frequency assignment to a transmitting station is capable of causing harmful interference to the stations of another administration operating in accordance with the Radio Regulations does not lie only on the side of the administration operating the transmitting station that may be producing the interference and other administrations should have information about a use under No. **4.4** to assess its interference potential or identify the source of harmful interference. For this reason, an administration intending to use a frequency assignment to a transmitting station under No. **4.4** has to notify to the Bureau this frequency assignment, pursuant to Article **11.3**, if possible prior to bringing it into use. For space services, this includes the prior application of the relevant provisions of Article **9** (see also § 1.3 above).”

Thus the RoP explain that administrations are responsible for:

Establishing that their devices operating as intended under No. 4.4 will not harmfully interfere with other administrations' operations;

Demonstrating a plan to shut devices down if they do so interfere;

Affording other administrations the ability to make their own determination of the potential for interference from such devices;

Notifying the Bureau of such operation under Article 4.4, in advance if possible.

III. Frequency assignments in bands protected by RR No. 5.340

Section 2 of the RoP for No. 4.4 concerns assignments in frequency bands where the assigned use is specifically forbidden. Section 2.1 prohibits assignments in frequency bands protected by RR No. 5.340 where “all emissions are prohibited.”

In this regard, section 2.2 of the RoP states:

The Board considers that, in view of this prohibition, a notification concerning any other use than those authorized in the band or on the frequencies concerned cannot be accepted even with a reference to No. 4.4; furthermore the administration submitting such a notice is urged to abstain from such usage.

That is, although administrations should notify the Bureau of assignments in derogation of the Radio Regulations (so that other administrations might be made aware of them), frequency assignments contrary to RR 5.340 are so far beyond the pale that they should not be made and the Bureau will not recognize them if so notified.

IV. Notification of frequency assignments contrary to RR 5.340

It is a paradox that the most serious actions contrary to the Radio Regulations cannot be notified to the Bureau for dissemination to other administrations. A possible solution is found in footnote 3 to Section 1.5 of the RoP:

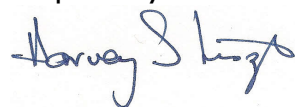
³ It is recognised that the exchange of information about the use of frequency assignments, including those under No. 4.4 by stations of terrestrial services in certain bands (e.g. in bands not shared with space services), could also be achieved through bilateral/multilateral arrangements or mechanisms.

V. Spectrum Horizons Experimental Radio Licenses in passive service bands

The FCC has stated its intention to consider granting Spectrum Horizons Experimental Radio Licenses in frequency bands subject to RR 5.340 (the FR&O at ¶18 – 26), without explicitly noting the obligations that accrue to such action by virtue of the RoP for RR No. 4.4. Applicants for such licenses should be aware of them and they should be recognized in whatever actions issue from the Spectrum Horizons proceeding.

NRAO once again implores the Commission to abstain from granting Spectrum Horizons Experimental Radio Licenses in frequency bands subject to RR 5.340. If the Commission is determined to proceed with this ill-advised and strongly-deprecated step, it should trap the operation of such devices well within United States borders.

Respectfully submitted



Harvey S. Liszt, hlistz@nrao.edu

To whom correspondence should be addressed

Annex 1

Rules concerning

ARTICLE 4 of the RR

4.4

1 Use of a frequency under RR No. 4.4 (MOD RRB18/78)

1.1 This provision states that “Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.”

1.2 The scope of the terms “in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations” is specified in No. **8.4** by the indication that the “other provisions” shall be identified and included in a Rule of Procedure. The Rules of Procedure on No. **11.31** provide a complete list of these “other provisions”.

1.3 The scope of No. **4.4** is therefore limited to derogations to the Table of Frequency Allocations and to the provisions listed in the Rules of Procedure on No. **11.31** with regard to the “other provisions”. In particular, administrations intending to authorize the use of spectrum under No. **4.4** still have the obligation, under Sections I and II of Article **9**, Nos. **11.2** and **11.3**, to notify to the Bureau “any frequency assignment if its use is capable of causing harmful interference to any service of another administration”.

1.4 Further, it can be seen from Nos. **8.5** and **11.36** that the recording of an assignment with a reference to No. **4.4** includes the commitment by the notifying administration to immediately eliminate any harmful interference actually caused to other frequency assignments operated in accordance with the Radio Regulations upon receipt of advice thereof. This limitation on the use of an assignment notified with a reference to No. **4.4** is valid only when both categories of assignments detailed in No. **8.5** are in use.

1.5 The Board considers that the determination of whether or not a frequency assignment to a transmitting station is capable of causing harmful interference to the stations of another administration operating in accordance with the Radio Regulations does not lie only on the side of the administration operating the transmitting station that may be producing the interference and other administrations should have information about a use under No. **4.4** to assess its interference potential or identify the source of harmful interference. For this reason, an administration intending to use a frequency assignment to a transmitting station under No. **4.4** has to notify to the Bureau

this frequency assignment, pursuant to Article 11⁴, if possible prior to bringing it into use. For space services, this includes the prior application of the relevant provisions of Article 9 (see also § 1.3 above).

1.6 The Board also concluded that administrations, prior to bringing into use any frequency assignment to a transmitting station operating under No. 4.4, shall determine:

- a) That the intended use of the frequency assignment to the station under No. 4.4 will not cause harmful interference into the stations of other administrations operating in conformity with the Radio Regulations;
- b) What measures it would need to take in order to comply with the requirement to immediately eliminate harmful interference pursuant to No. 8.5.

When notifying the use of frequency assignments to be operated under No. 4.4, the notifying Administration shall provide a confirmation that it has determined that these frequency assignments meet the conditions referred to above in item a) and that it has identified measures to avoid harmful interference and to immediately eliminate such in case of a complaint.

1.7 Taking into account No. 4.4 as well as Nos. 5.43 and 5.43A, frequency assignments to receiving stations not in conformity with the Radio Regulations are recorded with a symbol which includes the indication that the notifying administration cannot claim protection from any harmful interference that may be caused by frequency assignments operated in accordance with the Radio Regulations.

See also the Rules of Procedure relating to No. 11.37.

2 Emissions in bands where uses other than those authorized are prohibited

2.1 The provisions listed below relating either to frequencies or bands to be used for safety and distress communications or allocated for passive usage prohibit any other use:

- a) *Provisions relating to safety and distress communications:*

Appendix 15 (GMDSS), Tables 15-1 and 15-2: frequencies marked with an asterisk (*) to indicate that any emission causing harmful interference to distress and safety communications is prohibited.

- b) *Provisions relating to passive usage:*

No. 5.340.

2.2 The Board considers that, in view of this prohibition, a notification concerning any other use than those authorized in the band or on the frequencies concerned cannot be accepted

⁴ It is recognised that the exchange of information about the use of frequency assignments, including those under No. 4.4 by stations of terrestrial services in certain bands (e.g. in bands not shared with space services), could also be achieved through bilateral/multilateral arrangements or mechanisms.

even with a reference to No. 4.4; furthermore the administration submitting such a notice is urged to abstain from such usage.