

AVN Training 2019 – RFI Exercise

Applicable documents:

Independent Communication Authority of South Africa – National Radio Frequency Plan 2013 - <https://www.icasa.org.za/uploads/files/NatRadFreqPlan2013GG.pdf>

In the national frequency plan you will find the allocated frequency bands together with their typical applications and comments. Some references are also made e.g. 5.388B which are usually explained in more detail on a subsequent page or in some cases at the end of the document (e.g. 5.388B can be found on page 163/344).

The columns as listed in the frequency plan are repeated here for convenience.

ITU Region 1 Allocations	South African Allocations	Typical Applications	Comments
87.5 – 100 MHz			
BROADCASTING	BROADCASTING	Sound Broadcasting	
5.190			

Taking the above as example:

Column 1: ITU Region 1 Allocations

This column describes what the frequency has been allocated for in International Telecommunications Union Region 1.

87.5 – 100 MHz

This refers to the frequency band of interest. In this case starting at 87.5 MHz and ending at 100 MHz.

BROADCASTING and 5.190

In the ITU Region 1 this frequency has been allocated for BROADCASTING (refer to page 6) and 5.190 (refer to page 311).

Column 2: South African Allocations

The second column describes what this frequency band has been allocated for in the South African context. ICASA is the local regulator and in this case they have agreed with the international allocation of this frequency band and listed that it has been allocated for BROADCASTING.

Column 3: Typical Applications

The band has been allocated for BROADCASTING, but this is an encompassing term including various transmissions directly to the public. To define the usage of this band further column 3 indicates that typically this allocation is used for Sound Broadcasting and therefore it is most commonly associated with radio stations.

Questions:

The scenario is as follow. You work at the Hartebeesthoek Radio Astronomy Observatory and overhear your colleagues talking about some anomalies that they have found during observations with the 26m radio telescope. You suspect, because of the patterns that they describe, that it is not a science breakthrough to do with the stars, but rather man made radio frequency interference (RFI).

Question set 1

Your colleagues give you the following information:

- The strange signals are only visible during the day, starting in the mornings and ending in the afternoons but it varies in time and strength.
- Sometimes there are also signals picked up on Saturdays and Sundays.
- The signals are at their strongest during S-Band observations.

1. Look up the radio frequency allocations in the National Radio Frequency Plan allocated to the S-Band (13cm wavelength) and then list the typical applications within this band.

2. Knowing what the typical applications are, and given the pattern that your colleagues mentioned what do you think is the mostly likely source of the RFI?

--