

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 2

Your colleagues give you the following information:

- During observations in the L-Band, there is a persistent signal near the upper portion of the band.
 - The same signal pattern that is being observed around 1800 MHz has also been observed during other experiments around 2100 MHz.
 - This is of international concern for various other observatories across the world have picked up similar interference.
1. Look up the radio frequency allocations for 1800 MHz (1710 – 1930) and 2100 MHz (2110 – 2160) in the National Radio Frequency Plan. You know the interference is local as well as international so compare the ITU Region 1 allocations (column 1) and South African allocations (column 2) and list the allocations that are the same in both columns for the 1800 MHz and 2100 MHz frequency bands.

1710 – 1930 MHz Allocations	2110 – 2160 MHz Allocations

2. You know the interference is similar in both the 1800 MHz band as well as the 2100 MHz band. Using the lists you compiled in question 1, identify the common allocations and describe what you think is the mostly likely source of the RFI?