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BHUTAN INFOCOMM AND MEDIA AUTHORITY

ROYAL GOVERNMENT OF BHUTAN



Frequency Band Plan in Band 40 (2300MHz - 2400MHz)

March, 2022



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1. Background

With the increase in the demand for mobile broadband services it is critical to enhance its Quality of Services (QoS) delivered to the customers. Recently, there were issues of degraded mobile broadband QoS especially during the lockdown period and it is important that every possible solution is studied and implemented for enhancing the mobile broadband QoS.

The network densification through deploying more mobile networks is one of the solutions to enhancing the mobile broadband QoS. However, owing to the limited land space especially in urban areas has significantly posed challenges to the telecom operators in expanding their mobile broadband networks. The other solution to solving such issues is through enhancing the network capacity by issuing more frequency spectrum to the telecom operators. The telecom operators in Bhutan have deployed 1800MHz (Band 3) and 700MHz (Band 28) for 4G LTE and these spectrum bands have been fully utilized. The available spectrum in 2.3GHz (band 40) is considered suitable for deploying the 4G LTE in Bhutan. Being able to deploy band 40 along with band 3 and band 28 will enhance the network capacity of mobile broadband services in the country.

However, in order to deploy band 40 (2.3GHz) for IMT services, there is a requirement to formulate the frequency band plan.

Therefore, this framework is developed formulating the frequency band plan in 2.3GHz to be implemented in Bhutan.

2. Legal Basis

This frequency band plan is prepared as per:

- a. Section 165 and 166 of the Information, Communication and Media Act of Bhutan 2018, which requires Authority, from time to time, prepare a frequency band plan in respect of any part of radio frequency spectrum,
- b. Subsection 1.2(a) of the chapter I of the National Radio Rules and Regulations 2021 (NRRR 2021) which requires the Authority to prepare frequency band plans.
- c. The band plan shall be the part of schedule A of NRRR- 2021.

3. Title and Commencement

This band plan shall come into force on the 23rd day of March, 2022 corresponding to the 21st day of the first month of Bhutanese Water Male Tiger Year.

4. Scope of Application

These band plan shall apply to:

- a. Any individuals, entity and organizations involved in the use and management of radio frequencies in Bhutan, and



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- b. All matters by any individuals, entities and organizations related to the radiocommunication within or from the territory of Bhutan, its atmosphere and its outer space, to stations and devices using radio spectrum.

And shall be read in conjunction with all other existing codes of practice, Rules and Regulations established by the Authority.

5. 2.3GHz Spectrum Allocation as per National Radio Rules and Regulations 2021

As per the National Frequency Allocation Table of Bhutan, the Primary Services allocation in 2.3GHz are for Fixed and Mobile services and the Radiolocation. The Amateur Radio is in the Secondary Services.

The table below shows the frequency allocation table for 2.3GHz

2 170-2 520 MHz

Allocation to services			
Region 1	Region 2	Region 3	Bhutan
2 170-2 200	FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F		2 170-2 200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F
2 200-2 290	SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392		2 200-2 290 SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION SATELLITE (space-to-Earth) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (space-to-Earth) (space-to-space) 5.392
2 290-2 300	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)		2 290-2 300 FIXED MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)
2 300-2 450 FIXED MOBILE 5.384A Amateur Radiolocation 5.150 5.282 5.395	2 300-2 450 FIXED MOBILE 5.384A RADIOLOCATION Amateur 5.150 5.282 5.393 5.394 5.396		2 300-2 450 FIXED MOBILE 5.384A RADIOLOCATION Amateur 5.150 5.282 5.393 5.394 5.396
2 450-2 483.5 FIXED MOBILE Radiolocation 5.150	2 450-2 483.5 FIXED MOBILE RADIOLOCATION 5.150		2 450-2 483.5 FIXED MOBILE RADIOLOCATION 5.150



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6. Consultation

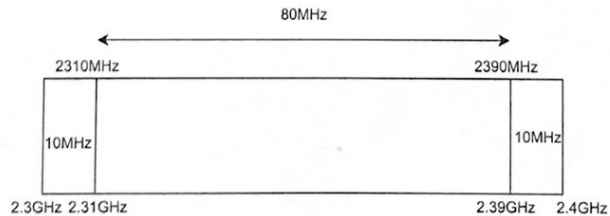
The framework was shared in the website for public feedback and a consultation was also carried out with the Telecom operators and the following comments were received.

Sl. No	Operators	Feedback received
1	Bhutan Telecom Limited (BTL)	BTL has no comments and has accepted the band plan proposed by the Authority
2	Tashi InfoComm Limited (TICL)	<p>Reserve contiguous 40MHz for each of the telcos. That is, if the 1st 40MHz is reserved for BTL, the 2nd 40MHz should be reserved for TICL.</p> <p>For 4G alone, only 20MHz bandwidth will be required. However, if operators decide to use the spectrum for mixed mode (4G and 5G simultaneously) deployment or fully 5G in future, the operators will need contiguous 40MHz bandwidth.</p> <p>Since the 2.3GHz band is also one of the common spectrum bands for 5G and deployment of mixed mode (4G + 5G) is feasible in the 2.3GHz band, TICL would like to recommend BICMA to allow telcos to use the band for both 4G and 5G technologies. That is, allocate it on a technology neutrality basis.</p>

7. Frequency band plan for band 40 (2300MHz - 2400MHz)

Band 40 is commonly used for network densification and the band planning is done by taking into consideration that, on both upper and lower end of band 40 there is the ISM band and frequency used by amateur radio respectively. A total of 20MHz guard band leaves a bandwidth of 80 MHz which will be divided among the two telcos.

The proposed band plan for band 40 is as shown as follows where the 80MHz in band 40 shall be allocated to the IMT services.



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