



# International Amateur Radio Union Region 1

## Interim Meeting – Vienna Austria

### 27-28 April 2019



**Document number:** VIE19 C5-015

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**Subject:** LORA frequencies for APRS on 433 MHz

**Committee(s):** C5

#### Introduction

Internet of things technology offers a full new range of technologies for wireless communication mainly with low power telemetry sensors. One of these is names “LORA” which stands for Long Range at Low Power. Low cost modules are available to cover ISM and 70cm band.

#### Background

Since 2017/2018 there is a growing number of radio amateurs that adopted LORA and LORA WAN modules, kits or commercial solutions. This is mainly due to the low cost and impressive performance with very low power on even long haul links. (20mW for 100km)

#### Key points and proposal

Since LORA modules and kits are available to cover our popular 70cm band (besides other VHF and UHF frequencies) a number of solutions have been created to use LORA in order to transmit beacons for APRS, weather stations and telemetry data for remote repeaters. In order to achieve short transmission cycles and reasonable data rates with low power over a practical distance for mobile and portable stations, the LORA module uses kind of “Spread Spectrum” technology. Depending on spreading factor, FEC and CRC configuration the bandwidth of such systems is about 125 kHz, which makes it very robust against interference from other sources in the ISM band on 433MHz. To assure interoperability and compatibility of such APRS-GPS trackers operated by radio amateurs with their call sign and according to the well-known PARS standard as defined by Bob Bruninga W4APR, it is important to have a commonly used LORA-APRS Frequency .Since GPS position data and short messages (SMS) are transmitted by these systems, there is the need for at least two coordinated frequencies. This should be done in a way that future broad band applications (like LTE400) are still

#### Recommendation:

We therefore propose to include two dial frequencies for LORA APRS in the 433 MHz segment.

- **433.775 LoRa-1 (from Node to Gateway BW 125kHz)**
- **433.900 LoRa-2 (from Gateway to Node , for messages, BW 125kHz)**

**Financial Implications:** none