

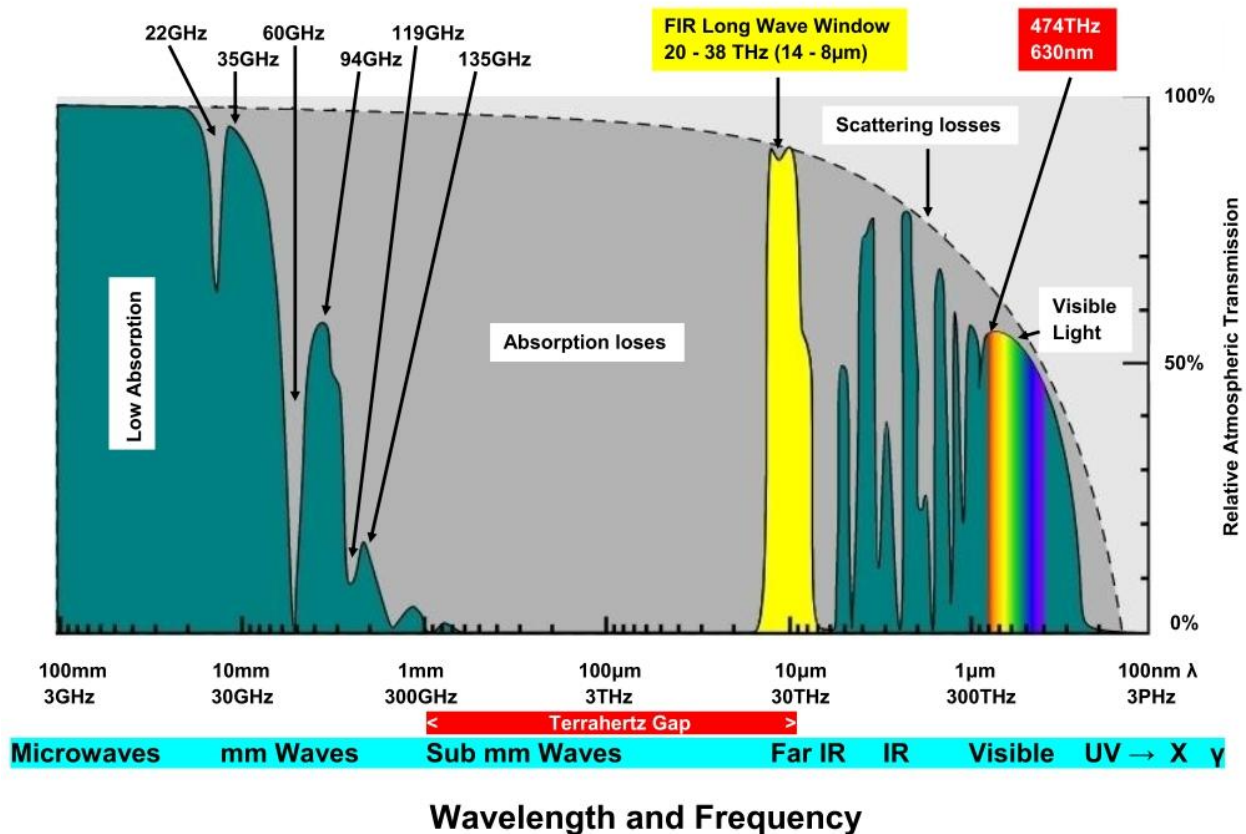
New 30THz band used for experimental Amateur radio communications

In November 2020, Andrew VK3CV / WQ1S and Karl VK3LN made a contact in a previously un-explored section of the upper electromagnetic spectrum at 30 Terahertz (THz) which is 30,000 GHz.

A two way contact over 60 metres distance was achieved with 5x5 signals received each way. The contact is believed to be the first ever in this band anywhere in the world.

The 30THz band sits above the upper mmWave bands (>300GHz) but well below the previously used optical band at 474THz in an area of spectrum know as the upper THz Gap. The band is shown in yellow in the diagram below at between 20 – 38THz. This area of spectrum sits in a very suitable low loss atmospheric window.

Atmospheric losses



A technical article is being prepared to detail the techniques and equipment utilized in the contact. In brief, The Transmitters used exploit what is known as Black Body radiation which is modulated with a manually operated gate or a steered reflector to send CW morse code pulses. The receiver technology uses a Thermopile sensor with an integral BPF. This is mounted in a dish reflector connected to a microprocessor to demodulate the THz signals and to provide an RSSI indication. See the VK3CV_WQ1S YouTube channel for a video made during testing.

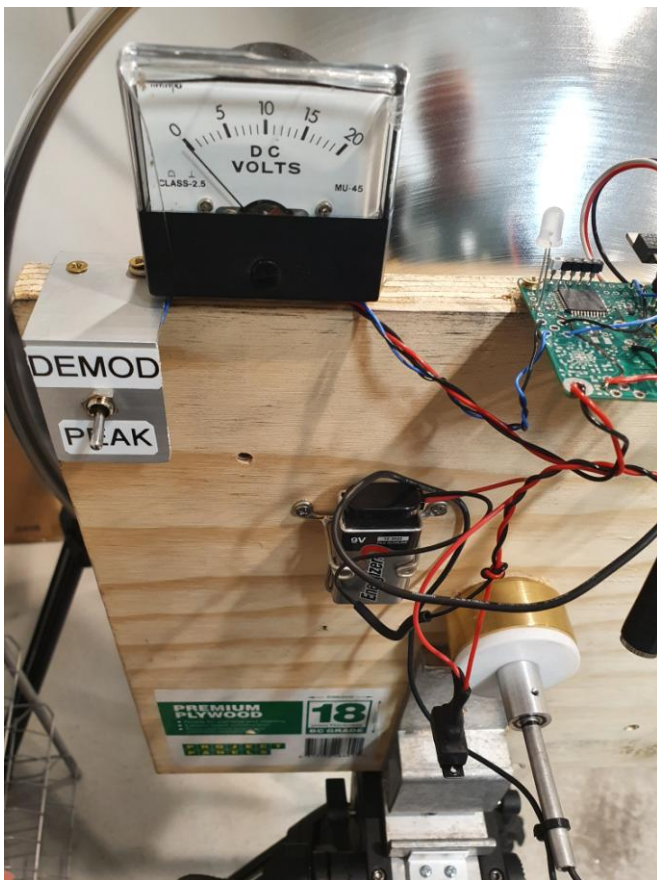
RX Rear



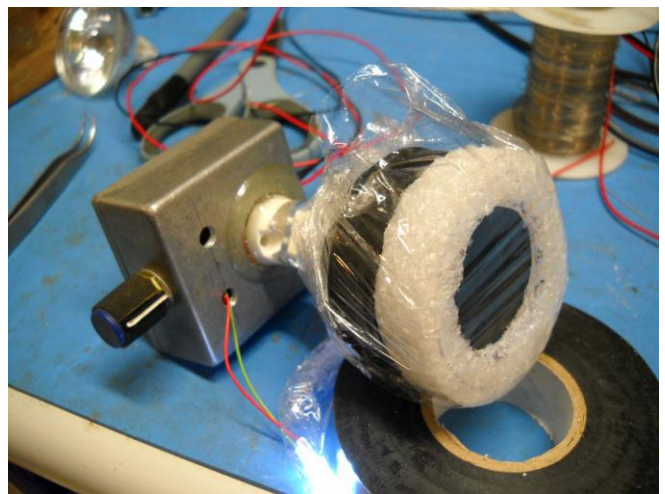
RX Front



RX RSSI and microprocessor board



Low power development test TX



RX detector element

