Satellite Operation

Microwave frequencies lend themselves readily to space and satellite operation. Radio amateurs can bounce signals off the moon and have access to a geostationary satellite transponder that provides coverage over one third of the globe. Uplink frequencies at 2.4 GHz and downlink frequencies at 10.5 GHz can be used for two-way voice, data and digital TV communications.

https://amsat-uk.org/satellites/geo/eshail-2/

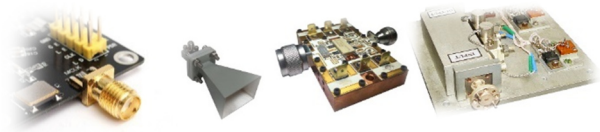
Technical and Operating Challenges

The lowest microwave bands (particularly 1.3 GHz) can be easier to activate with commercially available transceivers. In higher bands equipment and kits with lower frequency inputs and outputs (usually 144 MHz or 432 MHz) are available. However these tend not to be "plug and play" and the constructional work required to make an operational system makes an interesting challenge. Antenna systems can reduce in size as the frequency increases but the narrow beam antennas require good pointing accuracy. In higher frequencies there are challenges associated with frequency accuracy, stability, transmitter output power and receiver sensitivity. But these challenges drive the interest and there is a good community of willing helpers to assist.

Finding more information:

The UK Microwave Group is the core group for radio amateurs with an interest in frequency bands above 1GHz. The group issues a regular newsletter "Scatterpoint" for members and acts as a focal point for information on meetings around the UK for microwave enthusiasts (Round Tables). The group administers a series of operating contests and activity periods. The web site provides a central resource and links to many aspects of microwave band operating . The group is affiliated to the Radio Society of Great Britain (RSGB) and liaises closely with other special interest groups that use microwave communications such as the British Amateur Television Club.

https://www.microwavers.org



Affiliated to the Radio Society of Great Britain
http://www.rsgb.org/

UK Microwave Group

Amateur Radio and Microwaves

Amateur Radio is a great hobby for building on and developing an interest in radio-communications and technology.

Radio amateurs transmit and receive in specific frequency bands over the range 137 kHz to 248 GHz. Transmissions can be carrying analogue audio and voice communications or digital transmissions sending data signals such as Digital Amateur TV (DATV).

Very high frequencies above 1 GHz (1000 MHz) fall into the “microwave” domain which is a reference to the very short wavelengths at these frequencies. Even higher frequencies above around 20 GHz fall into the “millimetre-wave” region.

Operating radio systems in these frequencies is a specific interest in itself.

Frequency Bands

The table on the right shows the microwave frequency ranges available for radio amateur use according to agreed band plans in the UK. These are based on international agreements and align well with available bands in other countries.

Getting a Licence to Transmit

You don’t need a licence at all to listen to radio amateurs, but if you want to transmit back to them on the amateur bands, then a licence is a legal requirement.

All amateur radio licences are issued by Ofcom on behalf of the Government. Each licence holder receives a unique call sign, a short series of numbers and letters that identifies the owner world-wide!

Further information on radio amateur licensing can be found through the Ofcom web pages at www.ofcom.org.uk

Low power 2.3GHz band propagation beacon located in the southern UK. This has been received over 1000km away

Band	Frequency Range	Name
1.3 GHz	1240 – 1325 MHz	23 cms
2.3 GHz	2310-2450MHz	13 cms
3.4 GHz	3400-3410 MHz	9 cms
5.7 GHz	5650-5850 MHz	6 cms
10 GHz	10 -10.5 GHz	3 cms
24 GHz	24 – 24.25 GHz	24 GHz
47 GHz	47-47.2 GHz	47 GHz
76 GHz	75.5-81 GHz	76 GHz
122 GHz	122.25-123 GHz	122 GHz
134 GHz	134-141 GHz	134 GHz
241 GHz	241-250 GHz	241 GHz

Licence Progression

There are three tiers to the radio amateur licence. The first is the Foundation Licence. From this first step progression can be made to the Intermediate Licence and then the Full Licence. Each step requires more in depth knowledge but comes with increased privileges. A full licence allows access to all the amateur radio frequency bands available in the UK.