



Spectrum Forum Meeting – Saturday 20th January 2024

Spectrum Report – Amateur-Satellite Service

About AMSAT-UK

AMSAT-UK represents the interests of amateur satellite operators in the UK and is at the forefront of amateur satellite construction.

The thrill of communicating via satellites orbiting in space has led amateurs to develop stations for the VHF, UHF and Microwave bands when they may not have otherwise done so. Having established a satellite capable station many have gone on to discover the fascination of terrestrial DX working, so helping generate more activity in these allocations which are sometimes overlooked by amateurs who start out on the HF bands.

The [AMSAT-NA status page](#) provides up-to-date information on the operational status of the many amateur radio satellites currently in orbit.

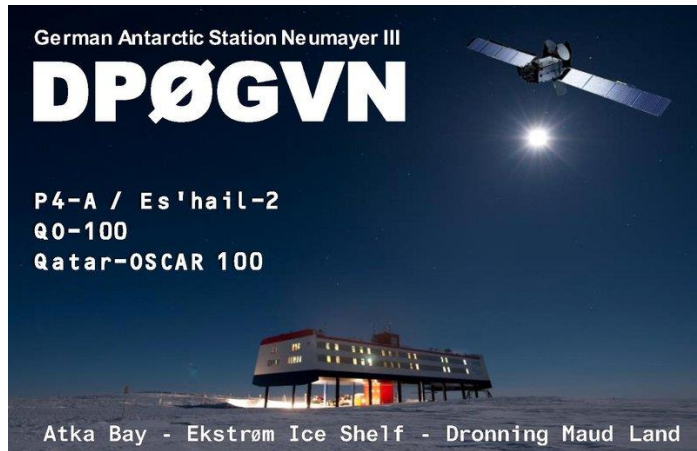
The FUNcube project

On November 21, 2023 the first FUNcube spacecraft AO-73 celebrated 10 years of successful operation in space. The spacecraft's battery has been showing signs of deterioration and the operating schedule has been adjusted to maximize the operational lifespan.

Annual Colloquium

The 2023 AMSAT-UK Colloquium was held in October as part of the RSGB Convention. An online video stream was kindly provided by volunteers from the BATC, enabling radio amateurs from around the world to participate. Of particular interest was the presentation by Frank Zeppenfeldt PD0AP on the Geostationary Microwave Amateur Payload Proposal. Videos of the Colloquium presentations are available on the [AMSAT-UK YouTube Channel](#).

Es'hail-2 Geostationary Amateur Transponder Satellite



[Es'hail-2](#) (QO-100), the first geostationary satellite to carry amateur radio transponders, launched on November 15, 2018 into a geostationary slot at 26 degrees East.

There are two 2.4 GHz to 10 GHz transponders; a 500 kHz bandwidth linear transponder for narrowband digital, SSB and CW communications and an 8 MHz wide transponder for Digital ATV.

The coverage of this spacecraft extends

from Brazil in the west to Thailand in the east.

There is a QO-100 ground station at the Neumayer-III research station in Queen Maud Land, Antarctica (DPØGVN). As part of the educational outreach contacts have been held via QO-100 between the base and school students.

The research station also hosts a FUNcube ground station which, due to its location near the South Pole, greatly increases the telemetry data that we receive from FUNcube satellites on almost every orbit.

AMSAT-UK and BATC collaboration continues to provide a WebSDR at the Goonhilly Earth Station in Cornwall, UK. This enables amateurs anywhere in the world to listen to the activity on the 10 GHz narrowband transponder downlink and view activity on the wideband transponder. It also provides a chat facility which is useful as a collaboration tool. In addition to the QO-100 ground station, through the support of GES (Goonhilly Earth Station Ltd) we also support a Web SDR covering 144-146, 435-437, 1296-1298 and 2320-2321 MHz located on the site.

Amateur Radio on the International Space Station (ARISS)

There are two amateur radio stations onboard the ISS. The station in the Russian Service module is used for the very popular Slow Scan TV (SSTV) transmissions as well as FM voice contacts with Russian school students. The other station, in the Columbus module, has the packet radio digipeater and supports school contacts for countries around the world.

The ISS HamTV DATV on 2395.0 MHz system that was so successfully used by UK astronaut Tim Peake KG5BVI / GB1SS and other astronauts developed a fault and was returned to Earth for repair. This repair was done and subsequently the transmitter was fitted with a 5-pole filter to meet new NASA mission standards, there then followed extensive NASA compliance tests. It is hoped it will be sent to the ISS and installed during 2024.

Frequencies used by ARISS:

144.490 MHz FM Voice Uplink in Regions 2 and 3
145.200 MHz FM Voice Uplink in Region 1
145.800 MHz FM Voice and SSTV Downlink

145.825 MHz FM APRS Digipeater
145.990 MHz FM Repeater Uplink

145 MHz frequencies have a Doppler shift of +/- 3.5 kHz
During a pass the 145.8 downlink can be anywhere between 145.7965 and 145.8035 MHz

437.050 MHz FM CubeSat Relay Uplink
437.525 MHz FM Voice School Contact Downlink
437.550 MHz FM APRS Digipeater
437.800 MHz FM Repeater Downlink

437 MHz frequencies have a Doppler shift of +/- 10.5 kHz

ARISS are also planning an FM Voice Uplink in 23cm.

HamTV 2395.0 MHz +/- 57 kHz Doppler shift

Spectrum

AMSAT-UK acknowledges the considerable work by IARU volunteers involved with WRC-23 in defence of Amateur and Amateur-Satellite Service allocations especially with regards to retaining a presence within 1260-1270 MHz for the Amateur Satellite Service.

As stated in previous reports it remains an aspiration that the Amateur-Satellite Service allocations at UHF and Microwaves should align with the weak-signal sections of the bands. In particular it is desirable that the European Common Frequency Allocation Table Footnote EU17 sub-bands, **5660-5670 MHz** and **10360-10370 MHz** along with **50-51 MHz** and new 10 MHz wide L-band and S-band segments become available to the Amateur-Satellite Service for both Earth-to-Space and Space-to-Earth communications.

Other Activities

AMSAT-UK hosts the [Amateur Satellite Frequency Coordination Status](#) pages for the IARU. These pages give details of the many Amateur Radio satellite projects under development.

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<http://www.amsat-uk.org/>