

Es'Hail-2 Launching soon!

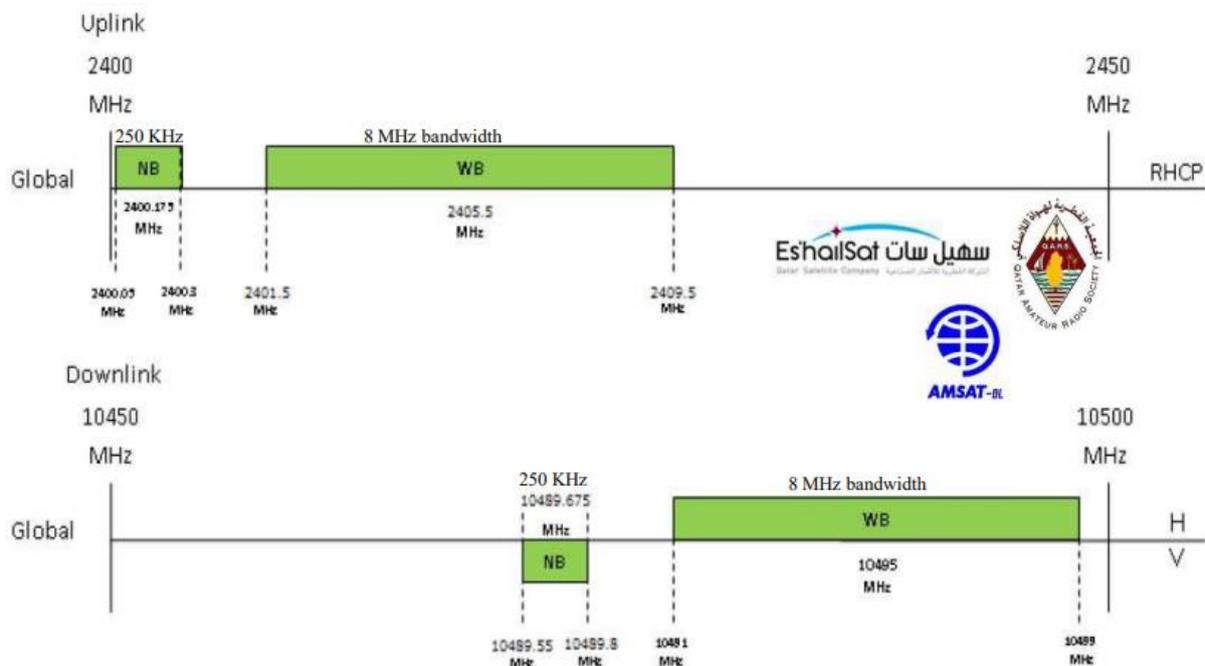
At the time of writing this report the exact launch date for this unique spacecraft has not yet been confirmed. The latest news that has been published says 4th quarter 2018 so it could be really quite soon.

The coverage of this spacecraft will be constrained by the radiation pattern of the antennas being used for the uplink and downlink. We understand that these are horns and that they have been designed to have “global” coverage. The map shows the potential coverage down to 0 degrees of elevation for the ground station antenna.



The two transponders will provide 24/7 coverage for both narrow band and wide band signals.

This chart shows the two transponders, their passbands and uplink and downlink polarisations. Note that, unlike the linear transponders on most other amateur satellites, these transponders are not inverting.



Xpdr No	U/L FREQUENCY (MHz)				D/L FREQUENCY (MHz)				LO (MHz)	BW (MHz)
	Pol	Begin	Center	End	Pol	Begin	Center	End		
NB	RHCP	2400.05	2400.175	2400.3	V	10489.55	10489.675	10489.8	8089.5	0.25
WB	RHCP	2401.5	2405.5	2409.5	H	10491	10495	10499	8089.5	8

Es'hail-2 Narrowband Transponder – Provisional Operating Guidelines

The narrowband transponder is intended for conventional analogue and narrowband digital signals.

No transmissions should be made beyond the nominal edges of the transponder passbands. In particular, no operation should take place below the lower beacon which will be on 10489.55 MHz nor above the upper beacon on 10489.80 MHz. These will both transmit data at 400bps BSPK in a similar format to that used on the AO/10/13/40 P3 missions.

No uplinks should result in downlink signals that are stronger than these beacons. In the event that such signals are detected, they will be marked by a "LEILA" siren. When they have been marked by "LEILA", operators should immediately reduce their uplink power (ERP). More information about this LEILA-2 system can be found here <https://www.amsat.org/pipermail/amsat-bb/2016-June/059217.html>

No FM transmissions should be made to Es'hail-2 as these would use excessive power and bandwidth.

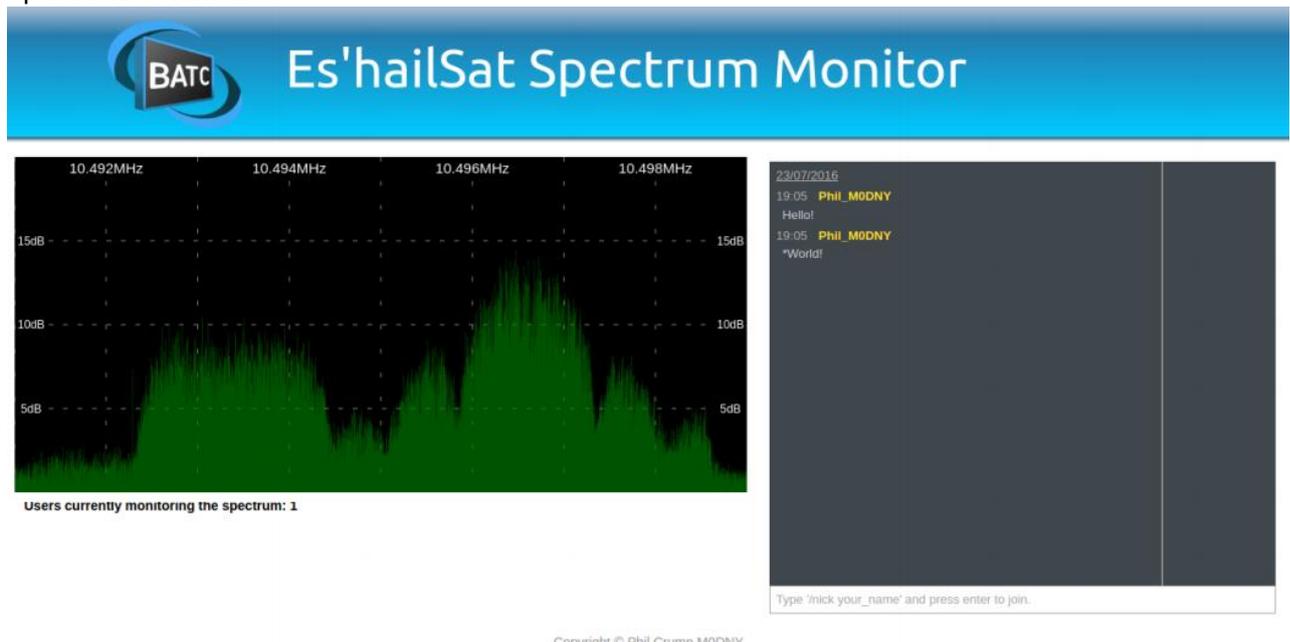
It will be possible to "see" the transponder passband by the use of a webSDR system that is being established at the Goonhilly Earth Station in Cornwall UK. This is provided by the BATC and AMSAT-UK. We are most grateful to Goonhilly Earth Station Ltd for their support. The url for this facility will be announced before operations commence.

Es'hail-2 Wideband Transponder – Provisional Operating Guidelines and bandplan

These operating guidelines and proposed bandplan are designed to enable the most efficient use of the 8MHz wide transponder for all users. It is expected that these initial guidelines will be further developed after commissioning.

Coordination

Due to the very large number of variations of transmission parameters, it is essential that all users notify their transmission parameters on the co-ordination chat room page that has been established by AMSAT-UK and the BATC. This facility, and the spectrum monitor system, is also being established at the Goonhilly Earth Station in Cornwall UK. The url for this facility will be announced before operations commence



Transponder Usage

As a general principle, the transponder should be only be used for short-duration tests and contacts. The only long-duration (more than 10 minute) transmissions should be:

- The TV beacon channel uplinked from Qatar or Bochum.
- Video of the live proceedings of AMSAT and Amateur TV Lectures and Conferences of wide interest. Examples might include:
 - o National AMSAT Conferences
 - o National Amateur TV Conventions

The following content is unacceptable:

- Images or video that is likely to cause offense to any operator or viewer
- Recordings of events, or broadcast of events not explicitly concerned with Amateur Satellites or Amateur TV
- Transmission of any copyright material (such as movies or TV channels)

The relaying of terrestrial Amateur TV Repeaters is discouraged unless the content is of exceptional amateur radio interest.

Transmission Power

All uplink transmissions should use the minimum power possible. No transmissions should have a downlink signal with a higher power density than the Beacon – the web-based spectrum monitor will enable users to set their uplink power to achieve this.

Transmission Modes

Transmissions should use DVB-S2 where possible as this has enhanced spectral efficiency. For normal standard definition transmissions, 2 MS is the maximum symbol rate that should be used.

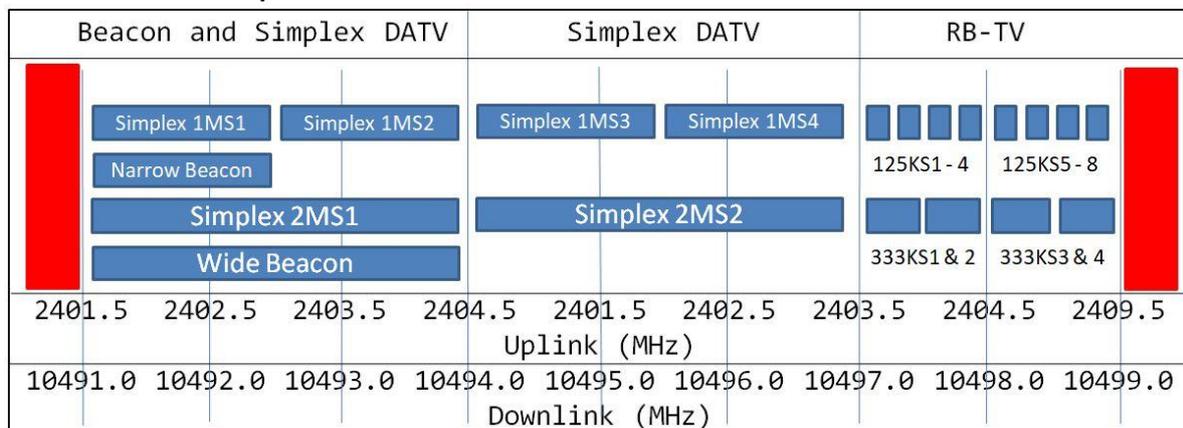
To enable easy decoding PIDs should be set as: Video 256, Audio, 257, PMT 32 or 4095, PCR 256 or 258. Service Name should be set to CallSign. PMT PIDs 4000 – 4010 should not be used. Users are encouraged to experiment with higher-order DVB-S2 modes at lower symbol rates (for example 333 KS 32APSK) to conserve bandwidth for other users.

On Wednesdays (UTC time), experimenters are encouraged to try other modes – perhaps 6 MS using the whole transponder for brief (less than 10 minute) periods. It is essential that users to announce their plans on the chat room page, and to always monitor it.

Beacon

The video beacon will initially run 24/7, but it is anticipated that, as more users become active, this will be reduced to a shorter period every hour.

Provisional WB Bandplan



And Finally

Although the launch is scheduled for later this year, we will have to continue to be patient for a period after launch for the formal commissioning process to be completed. Unlike the usual rapid commission undertaken by amateur CubeSats, this spacecraft will be carefully tested after launch before normal operations commence. It is the usual practise for this commissioning process to be undertaken away from the final location so do not expect to see/hear signals from 26 degrees east too soon!