



AMSAT-UK

Spectrum Forum Meeting – Saturday 9th July 2005

Spectrum Report – Amateur Satellite Service

The Amateur Satellite Service continues to develop new and innovative satellites for the benefit of the Amateur community.

We are, however, facing an increasing number of threats such as Galileo/UWB/WIMAX/WLAN/Zigbee to our microwave allocations.

In the Microwaves bands AMSAT-UK continues to believe there would be considerable benefits for all Amateurs if the frequencies for weak signal terrestrial working and satellite working were more closely aligned.

Alignment of Terrestrial and Satellite operations has already taken place at 24 GHz and we would wish to see similar co-ordination on the lower microwave bands.

The exclusion of the Amateur Satellite Service from the Foundation licence is making it extremely difficult for AMSAT-UK to attract newly licensed Amateurs into satellite operation. From the outset AMSAT-UK has supported the idea of Foundation holders having access to Amateur Satellites, which can provide an invaluable part of their Self Training. Ofcom have informed us that they will not countenance a change unless it is backed by the RSGB. The Amateur Satellite Service was withdrawn from the Foundation Licence at the last minute after a specific request from the then RSGB President. So far despite considerable correspondence with RSGB HQ there has been no change in their position.

Report by Band

28.300 – 28.510 MHz Satellite Uplinks and Downlinks

There is a PSK-31 transponder currently uplinking from 10 metres with a downlink on 2 metres. A satellite is currently under construction in New Zealand that will have a downlink in this allocation.

145.800 – 146 MHz Satellite Uplinks and Downlinks

This section is very heavily used by Amateur Satellites. In addition on the International Space Station there is an Amateur Packet Repeater and Voice operation from the Amateurs onboard taking place in this segment. Consideration needs to be given as to whether there is scope for allocating an additional narrow segment for the Amateur Satellite Service elsewhere in the 144 MHz band. See the

separate VHF Satellite Allocations discussion paper, which covers this matter in more detail.

Unauthorised FM activity from taxis; high power long-range cordless phones in Russia and walkie-talkies in the Middle East have been relayed through the Satellites causing considerable interference to Amateur operations.

435 – 438 MHz Satellite Uplinks and Downlinks

Radar operations in this band remain a nuisance but these are legitimate transmissions.

1.260 – 1.270 GHz Satellite Uplinks only

Galileo represents a significant threat to continued operations in this band. The wideband signal from Galileo will raise the noise-floor seen by Amateur Satellite receivers making access more difficult. Amateurs typically run 400 - 1000 watts EIRP to gain access to the satellites. Such power levels are certain to block any Galileo receivers in the vicinity of an Amateur station.

2.400 – 2.450 GHz Satellite Downlinks and Uplinks

The interference from the increasing number of consumer devices using this band grows daily making it increasingly difficult to copy the weak downlink signals. The very presence of these consumer products makes it impractical for Amateurs to transmit at the power levels necessary to uplink to satellites without causing blocking of this equipment.

Despite the tighter masking proposed by Ofcom for UWB operation it is likely that household UWB devices will still raise the noise floor in this allocation.

5.650 – 5.670 Uplink and 5.830 – 5.850 GHz Downlink

This allocation comprising an Uplink band at 5.65 and a Downlink band at 5.830 GHz. Wimax now being deployed across the UK by a number of companies is making the 5.830 downlink band unusable. This threatens the considerable investment in time and money that Amateurs have been putting into developing a 5.65 – 5.83 GHz transponder that is due to fly in 2 or 3 years time.

Ofcom proposals to use 3.1 – 6 GHz for UWB will raise the noise floor in this band and the adoption of UWB for a range of household products will make it near impossible to transmit on this band without causing blocking of UWB receivers in the vicinity.

10.450 – 10.500 GHz Satellite Downlinks and Uplinks

Use of UWB between 6 and 10 GHz could cause a threat to weak signal reception on this band. Ofcoms recent proposals to sell off this section could also threaten Amateur Satellite operation.

This allocation will be used for the first Amateur Satellite mission to Mars due for launch in 2007. The signals from the satellite when it goes into orbit around Mars will be extremely weak and any degradation of the noise floor is undesirable.

24.000 – 24.050 GHz Satellite Downlinks and Uplinks

Ofcom are now permitting Car Radar systems to use this allocation.

47.000 – 47.200 GHz Satellite Downlinks and Uplinks

Satellite transponder for 47 GHz is currently under construction and due for launch in 2006.

APPENDIX A – Current Operational Amateur Satellites

Name	Cat No.	Launch Date	Downlink	Uplink
VO-52	28650	May 05,2005	145.875 - 145.925 145.940 145.860	435.225 - 435.275
AO-51	28375	June 29, 2004	435.300 435.150 2401.200	145.920 145.860 1268.700
CUTE-1	27844	June 30,2003	436.8375 437.4700	
SO-50	27607	December 20, 2002	436.795	145.850
AO-49	27605	December 20, 2002	145.825	435.275
MO-46	26548	September 26, 2000	437.325	145.850 145.925
ISS	25544	November 20, 1998	145.800	145.990 145.200 437.800
PO-34	25520	October 30, 1998	436.500	
SO-33	25509	October 24, 1998	437.910	
GO-32	25397	July 10, 1998	435.225	145.850 145.890 145.930
FO-29	24278	August 17, 1996	435.80 - 435.90 435.795 435.910	145.90 - 146.00 145.850 145.870 145.910
AO-27	22825	September 26, 1993	436.795	145.850
LO-19	20442	January 22, 1990		145.84 145.86 145.88 145.90
AO-16	20439	January 22, 1990	437.026 2401.1428	145.90 145.92 145.94 145.96
UO-11	14781	March 1, 1984	145.826 2401.500	
AO-10	14129	June 16, 1983	145.975 - 145.825 145.810	435.030 - 435.180
AO-7	07530	November 15, 1974	29.400 - 29.500 145.975 - 145.925 29.502 145.972 435.1 2304.1	145.850 - 145.950 432.125 - 432.175

APPENDIX B – Satellites In Orbit But Not Currently Operational

Name	Cat No.	Launch Date	Downlink	Uplink
PO-28	22829	September 25, 1993	435.075 435.275	145.925 145.975
IO-26	22826	September 26, 1993	435.812	145.875 145.900 145.925 145.950
RS-12	21089	February 5, 1991	29.410 - 29.450 29.408 29.454	21.210 - 21.250
RS-13	21089	February 5, 1991	145.860 - 145.900 145.860 145.908	21.260 - 21.300
UO-14	20437	January 22, 1990	435.070	145.975
UO-22	21575	July 17, 1991	435.120	145.900
RS-15	23439	December 26, 1994	29.354 - 29.394 29.352	145.858 - 145.898
FO-20	20480	February 07, 1990	435.80 to 435.90 435.795	145.90 to 146.00
KO-23	22077	August 10, 1992	435.170	145.900
KO-25	22828	September 26, 1993	436.500	145.980
SO-35		February 23, 1999	145.825 145.900	436.291 436.250
UO-36	25693	April 21, 1999	437.025 437.400	145.960
AO-40	26609	November 16, 2000	2401.225-2401.475 24048.01-24048.06 2401.323, 24,048.035	145.840 - 145.990 435.550 - 435.800 1269.250 - 1269.500 1268.325 - 1268.575 2400.350 - 2400.600
SO-42	26549	September 26, 2000	437.075	
SO-41	26545	September 26, 2000	436.775	145.850
NO-44	26931	September 30, 2001	435.250 144.390 (Region 2 Only)	145.827

APPENDIX C – Satellites Planned For Launch 2005/6

Name	Proposed Launch Date	Downlink	Uplink
UCISAT	October 31, 2005	?	?
SSETI	August 25, 2005	2400	435
PCSat2	Summer 2005	435.?	145.825
Phase3E	Early 2006	145.845 – 145.945 145.812 145.957 145.837 10450.? -10450.? 2400.600 - 2401.000 2400.275 - 2400.425 2400.250 2400.500 24048.275-24048.325 24048.350 47088.275-47088.325 47088.350	29.495 - 29.505 436.050 – 436.150 436.200 – 436.350 1268.775 – 1268.925 1268.600 – 1268.750 1260.275 – 1260.425 1260.100 – 1260.250 2400.? -2400.? 5668.575 - 5668.625
CP1 – N6CP	2005	436.845	
CP2	2005	437.325	
HAUSAT1 D90HP	2005	437.465	
ICE Cube 1 W2CXM	2005	437.305	
ICE Cube 2 N2VR	2005	437.425	
ION	2005	437.505	
KUTEsat KC0RMW	2005	437.385	
MEROPE K7MSU-1	2005	145.980	
nCUBE1	2005	437.305 2407.25	
RINCON WA4CEW	2005	436.870 437.345	
SACRED WA4CEW	2005	436.870	
SEEDS JQ1YGU	2005	437.485	
Mea Huaka	2005	437.405	

Trevor Hawkins M5AKA
AMSAT-UK

