Recommendation SFCG 29-2

FREQUENCY ASSIGNMENT GUIDELINES FOR ACTIVE REMOTE SENSING IN THE LUNAR REGION

The SFCG,

CONSIDERING

a) that concurrent active remote sensors and a regional communication network can be expected in the foreseeable future in the Lunar region as missions to the moon increase in number and variety;

b) that frequencies for spaceborne active sensors are provided in the existing allocations to space research service (SRS) (active);

c) that frequencies for direct communication between a spacecraft in the Lunar region and an earth station are provided in the existing allocations to SRS;

RECOGNISING

a) that active remote sensors in the Lunar region must not interfere with the direct communication links between space and the Earth using frequency bands allocated in the ITU Radio Regulations;

b) that active remote sensors in the Lunar region also need to avoid interference with frequencies used by Lunar relay networks and other communication equipment in the Lunar environment;

c) that in accordance with Resolution SFCG 23-5, agencies planning to develop active remote sensors for use in the Lunar region, work together with IUCAF to study issues of compatibility of a radio astronomy observatory in the shielded zone of the Moon;

RECOMMENDS

1. that agencies select frequencies from Table 1 for active remote sensing in the Lunar region according to the specific applicability and precautions recommended in Table 2;

2. that assignment of Lunar active remote sensing frequencies be coordinated within the SFCG with special attention given to ensure compatibility with communication links in the Lunar region;

3. that this Recommendation be reexamined when RAS observatories in the shielded zone of the Moon are being deployed.

Frequency Band (MHz)
1-15
50-52
148-151
460-480
1215-1300
2378-2387
3100-3300
5250-5570
8550-8650
9300-9900
13250-13750
17200-17300
35500-36000
78000-79000
94000-94100

Table 1: Summary of Frequency Bands for Active Remote Sensing in the Lunar Region

Active Sensing Frequencies	Instrument	Adjacent Radiocommunications Links allocated in Rec 22-1R1	Guardband, Minimum Separation between Bands	Interference Mitigation
460-480 MHz	SAR Imager	435-450 MHz relay	10 MHz	Bandwidth to range from 2.5 MHz to 7.5 MHz (as for Mars Eagle) with center frequency of 465 MHz; sensor band moved to 460-480 MHz for 10 MHz guardband
2.38-2.385 GHz	SAR Imager	2.2-2.3 GHz relay and space-to-Earth	80 MHz	Bandwidth about 1 MHz with center frequency of about 2.385 GHz (as for Magellan); sensor could move to the right if necessary but stay within allocated band 2.38-2.385 GHz
8.55 - 8.65 GHz	active sensor	8.45-8.50 GHz relay	50 MHz	Bandwidth for typical SAR about 20 MHz with center frequency of 8.6 GHz; could move to the right but stay within allocated band 8.55-8.65 GHz
13.25 - 13.75 GHz	active sensor	14.5-15.35 GHz relay	750 MHz	Bandwidth for high resolution altimeter around 320 MHz (similar to TOPEX/JASON) with center frequency of 13.5 GHz; could move to left but stay within allocated band 13.25-13.75 GHz
35.5 – 36.0 GHz	active sensor, topographic mapper	34.2-34.7 GHz Earth-to-Space	800 MHz	Bandwidth for high resolution altimeter around 320 MHz (similar to TOPEX/JASON) with center frequency of 35.75 GHz; could move to right but stay within allocated band 35.5-36.0 GHz; Bandwidth for high resolution topographic mapper up to 500 MHz with center frequency of 35.75 GHz; if less than 500 MHz, could move to right but stay within allocated band 35.5-36.0 GHz

Table 2 – Notes on Select Lunar Active Sensing and Radiocommunications Links Frequencies Recommended in Table 1 (based on interference analysis of SRS (active) and radiocommunications links in the Mars Region)