European Satellite Operators Association

The Importance of Satellite Access to C Band Spectrum In Africa September 2012

INTRODUCTION

Satellite systems and networks require hundreds of millions of Euros of investment, and years of advance planning and construction prior to deployment. Investment decisions related to development of networks are made based on the business case and require market access on reasonable terms to the countries in the footprint. Once a satellite is operational, commercial viability depends on the availability of spectrum and the applicable regulatory regimes that the satellite network will be serving.

Satellite companies use their satellites to deliver a full range of services including among others: broadcast and other program distribution; broadband; maritime; aeronautical; government and emergency communications; telecommunications and private data networks, mobile fleet / traffic management and telemedicine. In particular, satellite has been at the forefront of digital TV & high definition television ("HDTV") development and should also be considered as one of the best platforms for the further growth of HDTV and the development of 3-D and interactive on demand digital services. Taking advantage of the high reliability of their infrastructure, European satellite operators have also long used their networks to ensure connection everywhere in the world during the most difficult man-made and natural disasters. Furthermore, satellite is the only available means of communications able to efficiently and immediately deliver broadband to all underserved or un-served areas.

For example satellites are an ideal means of providing affordable broadband connectivity to rural and remote areas in Africa which represent 100eds of millions of citizens. Satellites also provide critical emergency services to first responders particularly when other means of communications are unavailable.

The success and stability of satellite services for users is inextricably linked to the ability of the satellite operator to access enough spectrum that is free of damaging interference, and without the risk that such spectrum may be taken away after the investment has been made.

ESOA asbl – 20th Floor, Bastion Tower
5, Place du Champ de Mars
B-1050 BRUSSELS – BELGIUM
URL : www.esoa.net

Tel : +32.2.550.3575
Fax : +32.2.550.3535
info@esoa.net

Secretary General
Ms. Aarti Holla-Maini
aholla@esoa.net

Association
Registration
N°93652002

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C BAND SPECTRUM (3400-4200 MHz)

C-band needs to be looked at globally.

Within the C-band spectrum, our sector has designed and is developing future communications systems. The band 3400 – 4200 MHz is very important for satellite communications in Africa, as in the rest of the world. Satellite service providers are using the C-band for global communications across continents, notably within Africa as well as between Africa and other regions.

For over 40 years, the satellite sector has used the whole 3400 - 4200 MHz frequency bands (C-band) for FSS. New C-band earth stations are being deployed all around the world on a regular basis, not to mention the countless number of Receive Only Earth Station (ROES) antennas used for TV reception that are distributed globally.

Governments, non-governmental organisations (NGOs), intergovernmental organisations (IGOs), businesses as well as individual consumers from everywhere in the world all depend on and benefit from the crucial services that are provided by FSS in the C-band.

Although the prospects of increased use of part of this spectrum for fixed and mobile terrestrial services such as WiMAX and the LTE limit the FSS business confidence to be able to use it, as it will likely cause harmful interference into satellite services using this band, the existing and planned uses of the 3400-4200 MHz band demonstrate that C-band will remain very important spectrum for the satellite sector.

The mobile terrestrial community argues that several of the bands identified at WRC-2007 for IMT are not consistent across the Regions or even in some cases within a Region, impacting adversely on global development of IMT. Further, they indicate that some of the bands identified for IMT have complex regulatory provisions.

The above arguments reflect what the satellite industry has already been indicating since before WRC-2007, i.e. *C-band was, and remains an unsuitable band to be used for IMT and other terrestrial access technologies*.

Sharing difficulties have not changed.

Nothing has changed from the sharing point of view during the recent study cycle (in the last 4-5 years). If anything, the results of the studies performed in the study cycle leading up to WRC-07 have been reconfirmed by the 2011 Report ITU-R S.2199 on the “Studies on compatibility of broadband wireless access (BWA) systems and fixed-satellite service (FSS) networks in the 3400-4 200 MHz band”. This report was approved jointly by ITU-R Study Groups 4 and 5.

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There is work going on in the ITU Study Groups on potential sharing techniques between IMT systems and FSS networks in the 3.4-3.6 GHz band, but these techniques can only be used in respect of a very limited number of earth stations at known locations and working in a specified frequency band. Some of the techniques would also have a significant impact on the cost of the earth stations and would require modifications to the existing earth station installations.

Moreover, these techniques do not provide any solution in respect of protection of transportable earth stations or deployment of new earth stations. Therefore these techniques do not provide any basis for potential consolidation of this band for IMT or other terrestrial access technologies. Any techniques to improve sharing would have substantial disadvantages for one or both of the sharing parties.

It should also be highlighted that most FSS applications today operate in the range 3 600-4200 MHz and therefore WRC-07 limited changes to the Radio Regulations to frequencies below this band, i.e. 3 400-3 600 MHz, where there are fewer FSS applications currently in operation. Sharing between IMT and FSS applications would be even more challenging in the band 3 600-4 200 MHz.

Satellite C-band continues to grow.

Even excluding military satellites using C-band and satellites using C-band for TT&C, but not for their communications payload, there are currently more than 160 C-band satellites in orbit (i.e. there is a C-band satellite at almost every 2° around the entire geostationary arc).

About ¼ (one out of four) existing C-band satellites provide coverage of all or part of South Africa. In particular, satellite service providers are using the C-band for global communications within Africa and also to interconnect Africa with other regions. (*e.g.*, Europe, Middle East).

In addition, more satellites using the C-band are under construction. For example, at least 6 new satellites that include C-band payloads and that will serve South Africa will be launched within the next 2 years, all including spectrum down to 3700 MHz or below.

The transponder demand in all regions show healthy growth rates based on Euroconsult forecasts. New C-band earth stations are being deployed all around the world on a regular basis, not to mention the countless number of TVRO (Television Receive Only) antennas that are distributed globally.

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Examples of satellites in GSO with active C-band[1] payloads covering all or part of South Africa in 2012

(Excepting military satellites) [2]

°Long	Name	Operator	No. of C-band Transponders *	°Long	Name	Operator	No. of C-band Transponders *
53W	IS-707	Intelsat	42	11.5E	IS-603	Intelsat	64
50W	IS-1R	Intelsat	36	25E	Inmarsat-3 F5	Inmarsat	4[3]
47 W	NSS-703	SES		25E	Inmarsat-4 F2	Inmarsat	8[3]
45W	IS-14	Intelsat	36	26E	Arabsat 4C	Arabsat	24
43W	IS-11	Intelsat	25	31E	Arabsat 5A	Arabsat	16
54W	Inmarsat-3 F4	Inmarsat	4[3]	52.5E	Yahsat 1A	Yahsat	
37 W	NSS 10	SES	49	46 E	Africasat-1	Measat	
34.5W	IS-903	Intelsat	76				
31.5W	IS-25	Intelsat	38	47.5E	IS-702	Intelsat	33
29.5W	IS-801	Intelsat	64				
27.5W	IS-907	Intelsat	72	50 E	IS-26	Intelsat	12
24.5W	IS-905	Intelsat	72	57 E	NSS 12	SES	40
20 W	NSS 7	SES	49	60E	IS-904	Intelsat	76
22 W	SES-4	SES	52	62E	IS-902	Intelsat	76
18W	IS-901	Intelsat	72	64E	IS-906	Intelsat	72
15W	Inmarsat-3 F2	Inmarsat	4[3]	64E	Inmarsat-3 F1	Inmarsat	4[3]
5W	Eutelsat 5WA	Eutelsat	14	66E	IS-17	Intelsat	28
1W	IS-10-02	Intelsat	70	68.5E	IS-10	Intelsat	24
3W	ABS-3	Asia Br'g Co		68.5E	IS-7	Intelsat	14
3E	Rascom 1	Africa	8	72E	IS-706	Intelsat	42
5 E	SES-5	SES		72E	IS-709	Intelsat	33
10E	Eutelsat 10A	Eutelsat	20	75E	ABS-1	Asia Br'g Co	28

Total: at least **42** satellites operating C-band beams over South Africa

(including 22 from Intelsat, 6 from SES , 5 from Inmarsat, 2 from Eutelsat and 7 from other operators)

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[*] (equivalent 36 MHz bandwidth)

[1] (i.e. down-link within 3400-4200 MHz band, up-link within 5900-6400 MHz band)

[2] (Additionally it is known that a comparatively small number of military satellites use frequencies within C- band, for example Measat 1 & 2 at 46E & 6E and Leasat-5 at 72E.)

[3] (For Inmarsat satellites, C-band is used for feeder links and TT&C. The channelisation is not based on 36 MHz transponders used in most FSS satellites, but the numbers shown are indicative of the quantity of spectrum for comparison.)

List of some planned satellites having a C Band payload and covering all or part of South Africa

Intelsat IS-20 in Q4 2012 at 68.5°E, with 24 transp onders in the 3700-4200 MHz band;
Intelsat IS-22 in Q2 2012 at 72°E, with 48 transpon ders in the 3625-4200 MHz band;
Intelsat IS-23 in Q3 2012 at 53°W, with 44 transpon ders in the 3700-4200 MHz band;
SES-5 in Q2 2012 at 5°E, with 28 transponders in th e 3640-4200 MHz band;
Alphasat in Q1 2013 at 25°E, with 8 transponders in the bands 3550-3700 MHz;
Eutelsat 3B at 3°E.

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