

EADS Astrium

PROPOSAL TO AUCTION 28 GHZ SPECTRUM

EADS Astrium welcomes the opportunity to respond to Ofcom's public discussion document entitled "*Award of available spectrum: 10 GHz, 28 GHz, 32 GHz and 40 GHz: Spectrum packaging and auction design*", dated 11th January 2007.

Whilst we have no specific comments on the Ofcom proposals for the 10, 32 and 40 GHz bands, we do have significant concerns with regard to the 28 GHz band. Our concerns are immediate given that European-wide broadband services are due to be introduced in 2008 via a UK-based FSS satellite network (HYLAS) operating in this frequency band. Astrium in the UK is building the communications payload for the HYLAS satellite.

EADS Astrium previously provided comments via Intellect in response to the earlier consultation document published by Ofcom on 29th June 2006. Our view is that Ofcom's proposals would further fragment the 28 GHz band and be seriously detrimental to its exploitation for satellite broadband applications. Furthermore, we were seeking clarification on the status and arrangements for earth station uplink licensing in the 28 GHz band.

I take this opportunity to reiterate and elaborate on the concerns that we and others in the UK space industry raised at that time. Our detailed observations are attached in an annex to this letter.

We respectfully recommend the following actions in order to redress the inequity in the current proposals for the 28 GHz band:

- Allow Ka-band FSS gateway earth stations to be sited and operated on a co-primary basis in the UK at 28 GHz through additional regulatory provisions.
- Apply the "spectrum fees" described in Ofcom's statement "Modifications to spectrum pricing" (January 10, 2007) for satellite earth stations.
- Add as a condition to fixed and mobile terrestrial licences a requirement to undertake technical frequency coordination with FSS gateway earth station operators on the principle of equitable spectrum sharing on a co-primary basis and in accordance with existing international agreements.
- There should be no a priori requirement for an FSS gateway earth station operator to enter into any commercial negotiation or commercial settlement with any terrestrial operator (licence winner) in order to achieve successful technical frequency coordination, nor should the terrestrial operator be allowed to artificially block the progress of technical frequency coordination in any other way.
- Ofcom should retain the statutory power to intervene in the technical frequency coordination process to ensure that reasonable frequency coordination agreements are implemented.
- The frequency band 28.8365 – 28.9485 GHz should not be auctioned. It should instead be retained for FSS use in the UK for consistency with European spectrum harmonisation efforts (see ECC Decision ECC/DEC/(05)01).
- Gateway earth station operators should be urged to select sites that are technically suitable for frequency coordination with fixed and/or mobile service operators awarded spectrum in the 28 GHz range (where those sites also meet the commercial and technical requirements for appropriate backhaul and satellite interconnectivity). Fixed and mobile operators should equally be urged to select sites that are technically suitable for equitable sharing of the 28 GHz band.

We believe that the above actions would achieve the objectives of effective, efficient and equitable spectrum usage, whilst not harming 28 GHz terrestrial spectrum utilisation prospects.

ANNEX: Detailed comments on Ofcom's proposals for the 28 GHz band

Background

The band 27.5 – 30.0 GHz has been widely considered for use in Ka-band satellite broadband systems employing multiple spot beams for efficient spectrum use and compatibility with small and inexpensive user terminals.

The band 29.5 – 30.0 GHz is typically reserved for uplinks to the satellite from the user terminals. The bands 27.5 - 27.825 GHz, 28.4445 - 28.8365 GHz, 29.4525 - 29.5 GHz as well as the band 28.8365 –28.9485 GHz are designated in CEPT ECC Decision ECC/DEC/(05)01 for uncoordinated FSS earth station use and can also be used for the uplinks to satellites from the user terminals.

The frequency band within the approximate 28.0 – 29.5 GHz range is usually employed for gateway earth station (GES) FSS uplinks to the satellite. This “gateway” band encompasses the 28 GHz spectrum currently being considered for licensing by Ofcom (and includes spectral blocks already licensed for regional terrestrial use in 2000).

For Ka-band FSS satellite broadband systems to be commercially viable it is necessary to operate with relatively few gateway stations serving a large user terminal population. This requires access to a large amount of spectrum for the gateway uplinks, although this spectrum can be reused within different spotbeams, on different polarisations and by different satellite systems, resulting in high overall spectrum efficiency. The “gateway” band identified above provides up to 1.5 GHz of spectrum (in the approximate range 28.0 – 29.5 GHz) for this purpose.

Most broadband systems rely on the ready availability of most if not all of this contiguous spectrum to achieve their full capacity potential (and hence their full revenue potential).

Spectral Efficiency Considerations

EADS Astrium is in general agreement with Ofcom's strategy of ensuring optimal use of the radio spectrum. However, Ofcom's plans for the 28 GHz band seem to ignore the fact that Ka-band FSS satellite systems can achieve a very high degree of spectrum efficiency by reusing spectrum, as outlined above.

Equitable Access to Spectrum

EADS Astrium is also in general agreement with Ofcom's objective not to discriminate against any technology or application, as stated in the original consultation document.

The plans for the 28 – 29.5 GHz band (“28 GHz”) are clearly at odds with the objective of technical and application neutrality by virtue of the way that the 28 GHz spectrum is packaged for auction into national and regional blocks. This is clearly driven by terrestrial service considerations and consequently favours terrestrial technology and applications over satellite.

Radio frequency compatibility issues between terrestrial services and gateway earth stations transmitting in the 28 GHz band are confined to the geographical area immediately surrounding the earth station location (about a 50 km radius). In this context the notion of regional or national coverage is clearly inappropriate. Aside from the localised nature of spectrum sharing issues, there will also be only relatively few gateway earth stations serving a large number of users.

Existing and well-proven regulatory rules allow for technical coordination between satellite and terrestrial systems so that coexistence is possible without unacceptable restrictions being placed on either party. The recent public discussion document clarifies the situation regarding earth station uplink licensing in the 28 GHz band. It is now stated that *“those wishing to use the available spectrum for satellite operations may participate in the award”*.

This proposal effectively requires any Ka-band FSS gateway earth station operator to bid for and win licenses to exploit all of the auctioned frequency segments within the 27.5 - 29.5 GHz frequency range. Aside from the clear financial and discriminatory implications, this outcome is highly unlikely and gateway earth station operators will most likely be held hostage by terrestrial licence winners.

If any such bid were unsuccessful, the full capacity potential of the satellite system would not be realised with a potentially catastrophic effect on the business viability of the service. Operators would consequently be forced to locate their gateway earth station facilities outside of the UK with significant capital and operational investment moving abroad and a corresponding loss to the UK economy of skills, jobs (both direct and indirect) and tax revenue. Astrium itself could directly face such a decision in any turnkey project that were to include the supply and operation of the ground station facilities.

In summary, it makes absolutely no technical, business or economic sense for any FSS satellite operator or gateway earth station operator to take part in the spectrum auction process to gain the rights to use spectrum blocks across large regional areas of the UK or indeed nationwide. The auction process itself is therefore prejudicial to satellite applications.

International Dimension

There is an international dimension to the issue of 28 GHz licences that does not seem to be addressed in either the original consultation document, or in the more recent discussion document.

Spectrum assigned for satellite applications is generally covered by international obligations. The vast majority of satellite systems serving the European Union region offer trans-national and pan-European services. Whilst Ofcom seeks to optimise the use of radio spectrum nationally, spectrum management approaches are required that preserve or enhance access to harmonised spectrum on an international basis, including at a European level. Lack of harmonisation at European level decreases the economic viability of a UK-based pan-European satellite offering such as HYLAS.

Ofcom states that its proposals for the 28 GHz band are “*in the main consistent with ECC Decision (05)01*”. This Decision allocates sub-bands at a European level for either uncoordinated FSS earth station uplinks or fixed (terrestrial) services. The proposed 28 GHz spectrum packaging is indeed consistent with this Decision, except for the band 28.8365 - 28.9485 GHz, which was designated for uncoordinated FSS applications. Since some fixed networks were already licensed in some countries in this sub-band at the time the decision was approved, new terrestrial applications were permitted but were to be limited to additions to the existing networks. Clearly this is not the intention in Ofcom’s current proposals (despite the fact that Ofcom originally supported designation of this sub-band for uncoordinated FSS applications). By international agreement the frequency band 27.5 - 29.5 GHz is allocated to the Fixed Satellite Service (FSS), the Fixed Service (FS) and the Mobile Service (MS) on a co-primary basis. The same frequency band is also associated with satellite operation in Ofcom documentation (frequency allocations for the fixed satellite service in the UK).

Within this regulatory framework satellite service providers have a reasonable and indeed legitimate expectation to gain access to the 28 GHz frequency band in the UK on an equitable and proportionate basis.

Real Applications – HYLAS

The 28 GHz band is of immediate current interest for satellite telecommunications applications. Avanti Screenmedia Group plc is investing £80 million in the development of the first European dedicated Ka-band spot beam satellite system (known as HYLAS). Since December 2005 EADS Astrium has been manufacturing the satellite and has also invested significantly in the development of the enabling payload technology (see below). The system is scheduled to enter into service in 2008.

HYLAS exploits the contiguous band 28.0 – 29.5 GHz for gateway earth station uplinks. This encompasses almost the entire spectrum being considered for licensing by Ofcom. The neighbouring band 29.5 – 30.0 GHz will be employed for uplinks from small, unlicensed user terminals.

HYLAS is the first pan-European satellite programme of its type to be funded jointly by the public and private sector with a public sector contribution of £23 million¹. Fifty percent of the research and

¹ <http://www.bnsc.gov.uk/content.aspx?nid=5920>

development costs are being financed by HMG (DTI/BNSC) through the European Space Agency because the programme delivers objectives regarded as crucial to British industrial and social policy.

The HYLAS Ka-band satellite network has been registered with the ITU with the support of Ofcom². In registering the network, Ofcom's procedures for network registration were followed, including completion of a full due diligence procedure. The registration specifies utilisation of a UK gateway operating over the contiguous 28 - 29.5 GHz band.

As a UK initiative designed to deliver service across much of Europe, HYLAS represents a major opportunity for UK industry to generate direct export revenues through the utilisation of UK spectrum. Realising this service potential requires gateway earth station operation over the whole of the 28.0 GHz to 29.5 GHz band. If the UK licensing regime precludes operating the gateway earth station in the UK, then viable alternatives will have to be considered. These include locating the gateway earth station in Spain, with the corresponding significant capital and operational investments being made in that country rather than in the UK..

Innovation and Investment

Since 2000 some £17 million has been invested by EADS Astrium in innovative new technology to allow Ka-band satellite systems such as HYLAS to become a reality. Approximately one-half of this investment has been financed by HMG (DTI/BNSC) through the European Space Agency in recognition of the strategic value of such technology to the UK space industry. This Government contribution is in addition to that identified above for the specific HYLAS project.

With HYLAS commercial Ka-band satellite services are soon becoming a reality in Europe. However, EADS Astrium's and the UK's return on its investment is at risk of erosion if the licensing conditions are such that the vitally important gateway earth station has to be located elsewhere in Europe.

UK Government Policy Aspects

In "*Connecting the UK: the Digital Strategy*", April 2005, the Prime Minister states in the foreword that "*most important of all, we must make sure the whole of society can experience the benefits of the internet*". The HYLAS system and its forerunner the Avanti INSPIRE project³ work directly towards this objective at both the national and European level by providing cost-effective broadband access to rural communities where no infrastructure currently exists and where it is uneconomic to provide access by terrestrial means. The aforementioned report also states that "*we (the Government) also expect the market to drive take-up and use, through the creation of new and innovative services*". Unfortunately the proposed licensing regime unduly constrains the ability of UK FSS satellite operators to develop innovative satellite broadband systems that meet the UK government "*equal access*" to broadband objectives.

² Advanced Publication in BR IFIC 2556 of 01.11.2005, API/A/3839, ID Number 105540620, protected on 25/04/06.

³ <http://telecom.esa.int/telecom/www/object/index.cfm?fobjectid=27788>