



Commission for
Communications Regulation

Response to Survey and Decision

Submission to Fixed Links Survey

Submissions to Fixed Links Survey

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An Coimisiún um Rialáil Cumarsáide

Commission for Communications Regulation

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Submissions Received from Respondents

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1: Aviat Networks



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Reference: Submission re ComReg 12/10

Dear Sirs,

Aviat Networks welcomes the opportunity to be able to contribute to the Fixed Link Survey initiated by ComReg.

Q. 1 Please state your views regarding the current and proposed search parameters for the 23 GHz and 26 GHz bands as well as for existing and new frequency bands, providing technical proof in support of your views as appropriate.

Aviat Networks has nothing to add to the details contained within the consultation on this point.

Q. 2 Is the High/low interference radius the only issue that needs resolution before ComReg can consider releasing further national block licences in the 26 GHz band at some future date?

Aviat Networks has a general concern as to whether block licencing (block allocation) is the most spectrum efficient method of allocating spectrum to users. Our concerns are based upon the simple premise that once a user is allocated a block of spectrum, no other user has access to that spectrum and that can either cause congestion in other bands or lack of competition in service provision. In addition the owner of this block may not have sufficient traffic to fully utilise the amount of spectrum he now owns and as a result this spectrum is underutilised.

Q. 3 What are your views regarding the potential for permitting higher bandwidths in current fixed links bands as shown in Table 2?

Aviat Networks is in favour of allowing higher bandwidths in the current fixed link bands. However, we have one note of caution with respect to the 112MHz bandwidth regarding minimum occupancy rules. Since bandwidths of this order are still in their infancy and modem functionality is still under development, we would propose allowing the same channel occupancy as for 56MHz channels. We would further recommend that the minimum capacity be stated as an aggregate capacity as 4xSTM1 could mean anything between 622 and 760 Mbps (4x180). Thus ComReg should specify the capacities in Mbps - e.g.: 310, 620 Mbps, etc. This approach should also be adopted for the proposed new bands.

Q. 4 Would you welcome the opening of these three frequency bands? Are there any additional bands that ComReg should also consider? Support your answer.

Aviat Networks support the opening of these bands and support the opening of all bands in line with CEPT recommendations. The key to take up of these bands is equipment availability and user demand. Commonality of technical requirements by adoption of CEPT requirements is crucial to providing sufficient magnitude of scale to allow manufacturer to exploit these new bands,

Q. 5 Please state your views regarding opening part of the new frequency bands for Point-to-Multipoint use.

Aviat Networks is against using Point to Point bands for Point to Multipoint technology. We have a number of concerns with this proposal:

- there are only two Point to Multipoint vendors offering FDD systems that support TDM today, hence opening up these bands for licensed operation wouldn't serve the user community significantly, and is potentially anti-competitive in terms of the limited number of vendors in this market segment.
- there are many Point to Multipoint TDD systems on the market however these are not guaranteed service (carrier grade) systems and hence suited to unlicensed frequency use only.
- Point to Multipoint is actually a less efficient means of using a frequency band, and further, is not conducive to enabling multiple users of a band, i.e. difficult to coordinate the use of their respective Point to Multipoint systems? This would only work if the band was given entirely over to one user, on a national or regional basis.
- On the spectrum usage side, A single base station could be deployed only to serve a relatively few remote sites, this could be much less efficient than deploying PTP links for these same sites, since using Point to Multipoint will remove those frequencies from use over the entire area, not over the specific paths.

Q. 6 Please state your views regarding the current technical conditions for fixed links.

Aviat Networks believes that along with ourselves most equipment manufacturers are seeing a move away from the smaller (3.5MHz and narrower) channel sizes. We believe that future band plans should take this into account.

Yours faithfully



Ian Marshall
Regulatory Manager
Aviat Networks

2: BT Communications Ireland

Q. 1 Please state your views regarding the current and proposed search parameters for the 23 GHz and 26 GHz bands as well as for existing and new frequency bands, providing technical proof in support of your views as appropriate.

I have no issues with the search radius being reduced to 100m for the above bands. This will assist planning links in dense urban areas and maximise the use of these frequency bands. Because of the higher frequency ranges the antenna beamwidth will be quite narrow so interference will be minimal.

Also having urban and rural search radii may complicate the licensing process. The probability of having multiple links within 100m will be small so therefore I don't see much benefit in this.

Q. 2 Is the High/low interference radius the only issue that needs resolution before ComReg can consider releasing further national block licences in the 26 GHz band at some future date?

I believe that Comreg should consider allowing the use of 56MHz channels where operators have consecutive blocks of spectrum.

Q. 3 What are your views regarding the potential for permitting higher bandwidths in current fixed links bands as shown in Table 2?

I think this is a good move for Comreg to make. It will increase the potential use of spectrum and also make microwave transmission more competitive against fibre delivery to transmission sites. The higher bandwidths in 13GHz, 15GHz and 18GHz bands will be in highly attractive to operators.

Q. 4 Would you welcome the opening of these three frequency bands? Are there any additional bands that ComReg should also consider? Support your answer.

Yes, this would be beneficial to supporting mobile operator future rollout and enhancement. The higher frequency bands 40GHz + are of significant interest. The majority of BT links are in 38GHz band in dense urban areas. Often the link distance is so short we have to invest heavily in attenuation to satisfy Comreg guidelines. If the higher bands were available we could build links in that spectrum at lower cost i.e. no attenuation and offer significantly more capacity.

Q. 5 Please state your views regarding opening part of the new frequency bands for Point-to-Multipoint use.

I think it would be more beneficial to have lower frequency bands for point to multipoint. Cell size / reach and penetration is considerably lower at the higher frequencies meaning an operator needs a lot of spectrum to cover a single city for example.

Q. 6 Please state your views regarding the current technical conditions for fixed links.

If there is a release of more spectrum for fixed links in higher frequencies I believe it will resolve some challenges we have at present delivering high capacity links over short distances in urban areas. I am happy with the current mandatory technical conditions.

3: Eircom Group

eircom Group

**Response to ComReg Consultation Paper:
Fixed Links Survey**

ComReg Document 12/10

28 March 2012

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The comments submitted to this consultation are those of Meteor Mobile Communications Ltd. (MMC) and eircom Ltd (eircom) collectively referred to as eircom Group.

Response to Consultation

eircom Group welcomes the opportunity to comment on ComReg's reform proposals in respect of Fixed Links.

Q. 1 Please state your views regarding the current and proposed search parameters for the 23 GHz and 26 GHz bands as well as for existing and new frequency bands, providing technical proof in support of your views as appropriate.

eircom Group supports this proposal. The lowering of the search radii may aid frequency planning especially in urban areas and lessen new link application cancellations.

There is no issue with having a parameter of antenna no greater than 0.6m. In reality there is rarely, if ever, a requirement to utilise an antenna >0.6m in the 23/26GHz bands.

In addition to the above eircom does not have any issues with search radii applicable to the other frequency bands.

Q. 2 Is the High/low interference radius the only issue that needs resolution before ComReg can consider releasing further national block licences in the 26 GHz band at some future date?

eircom Group is not aware of any other issues requiring resolution.

Q. 3 What are your views regarding the potential for permitting higher bandwidths in current fixed links bands as shown in Table 2?

There is broad support for permitting higher bandwidths, and this will have benefits for future network rollout. We believe it is extremely important that the higher bandwidth combinations (56MHz) are made available in the 11, 13, 15, 18, 23 and 38GHz bands to allow high speed broadband roll out at radio served exchanges.

Q. 4 Would you welcome the opening of these three frequency bands? Are there any additional bands that ComReg should also consider? Support your answer.

There is broad support for the opening of higher frequency bands, and this will have benefits for future network rollout. These benefits will be particularly realised in the mobile environment, as hop lengths decrease and capacity requirements increase.

Q. 5 Please state your views regarding opening part of the new frequency bands for Point-to-Multipoint use.

In the interest of Spectrum efficiency, spectrum should only be reserved or opened up for point to multipoint operation if there is a market requirement. The current utilisation of point to multipoint within the 26GHz block licences might help inform ComReg's opinion on the requirement for point to multipoint licences in general.

Q. 6 Please state your views regarding the current technical conditions for fixed links.

We do not consider there to be any issues with the current technical conditions.

4: European Satellite operators Association

28 March 2012

ESOA comments on Fixed Links Survey Ref. Comreg 12/10

ESOA welcomes the opportunity to respond to the Comreg consultation on Fixed Links Survey (ref.Comreg 12/10 of 15/02/2012). ESOA here comments from the perspective that some of the bands currently used by the FS, or suggested for use by ComReg in the future, are also allocated for satellite services. While it is understood that congestion exists for fixed services in the currently available bands, ESOA courteously reminds ComReg that satellite applications also require access to some of the same frequency bands considered for fixed links and consequently there is a need to balance the spectrum requirements of terrestrial and satellite services.

In particular, Questions 4 and 5 ask for views related to the potential use of the band 27.5-29.5 GHz for fixed links.

There is, in fact, a clear demand at Ka-band (17.3-20.2 GHz and 27.5-30 GHz) for the provision of satellite applications including broadband, particularly in areas not well covered by terrestrial infrastructure (aircraft in flight, ships at sea, oil rigs), high quality broadcasting (HD and 3D) and many others which can only be effectively provided by satellites. Ka-band satellite systems are already playing a key role in closing the digital divide by providing broadband consumer Internet access to areas beyond the reach of ADSL and Fibre. Since Ku-band is already heavily used and has started to be congested, the satellite community also seriously expects to rely on Ka-band spectrum for their business growth in DTH services and contribution links.

On the other hand, Ka-band use for satellite applications, thanks to advances in technology, shows some clear advantages for fixed and mobile applications: larger available bands, use of spot beams with high gain/throughput, smaller/cheaper terminals, etc. While propagation can be challenging at these higher frequencies, impairments can be mostly overcome by counter-fade techniques such as adaptive modulation, power control, space diversity, etc.

However, ultimately, satellite use of Ka-band will depend on access to spectrum and on regulatory certainty, due to the significant investments involved in satellite programs. Feasibility of sharing with other services and availability of satellite exclusive portions of spectrum is a key aspect, as coordination is feasible for gateways, but not for high-density/fixed or mobile user terminals.

A survey by the Global VSAT Forum (dated November 2011 - attached) identified at least 26 Ka-band satellite systems in operation and a further 35 systems planned for launch over the next few years. These systems will operate not only in the exclusive satellite bands (19.7-20.2 GHz and 29.5-30 GHz) but also in other parts of the Ka-band, including the band 27.5-29.5 GHz which is suggested by ComReg as a new fixed link band.

ESOA notes that in section 1.3 of the consultation document ComReg identifies nine potential new bands for point-to-point services, and in section 1.4 Comreg identifies three potential new bands for point-to-multipoint services, each time including the 28 GHz band. ESOA recommends that the 28 GHz band is not opened to new fixed links. Although some of the other bands identified by ComReg are also allocated to satellite services, they are not expected to be used for uncoordinated terminals for the foreseeable future. From the perspective of satellite communications, it is essential that the introduction of the fixed links is limited to any of the alternatives to the 28 GHz.

ESOA thanks ComReg for the opportunity to comment and requests that ComReg takes up this recommendation.

We remain at your disposal for any further information you may require from us.

Sincerely,



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5: Inmarsat

Inmarsat response to Question 4 and 5 of the ComReg consultation on “Fixed Link Survey”

Q. 4: Would you welcome the opening of these three frequency bands? Are there any additional bands that ComReg should also consider? Support your answer.

Q. 5: Please state your views regarding opening part of the new frequency bands for Point-to-Multipoint use.

Inmarsat welcomes this opportunity to comment in particular on the proposed opening of the 27.5-29.5 GHz band for fixed terrestrial services in Ireland. While it is understood that congestion exists for fixed services in some of the currently available bands, Inmarsat courteously reminds ComReg that satellite applications also require access to some of the same frequency bands considered for fixed links and consequently there is a need to balance the spectrum requirements of terrestrial and satellite services.

There is, in fact, a clear demand at Ka band (17.3-20.2 GHz and 27.5-30 GHz) for the provision of satellite broadband applications, particularly in areas not covered by terrestrial infrastructure (aircraft in flight, ships at sea, remote areas, oil rigs), which can only be effectively provided by satellites. Furthermore, satellite is a critical infrastructure that is uniquely suited to provide quick, robust and reliable communications for public safety, disaster relief, etc.

The C- and Ku-band are already quite heavily used and, furthermore, the band on offer at C-band is relatively limited. On the other hand, Ka-band use for satellite applications, thanks to advances in technologies, shows some clear advantages for fixed and mobile broadband provision: larger available bands, use of spot beams with high gain/throughput, smaller/cheaper terminals, etc. While propagation can be challenging at these higher frequencies, impairments can be mostly overcome by counter-fade techniques such as adaptive modulation, power control, space diversity, etc.

However, ultimately, satellite use of Ka-band will depend on regulatory certainty, due to the significant investments involved in satellite programs. Feasibility of sharing with other services and availability of satellite exclusive portions of spectrum is a key aspect, as coordination is feasible for gateways, but not for high-density/mobile user terminals.

A survey by the Global VSAT Forum (dated November 2011) identified 26 Ka-band satellite systems in operation and a further 35 systems planned for launch over the next few years. The currently available bands, 19.7-20.2GHz and 29.5-30GHz, are already insufficient for systems

that are planned, including the new Inmarsat Global Xpress, let alone the forecast for future demand.

The Inmarsat Global Xpress (GX) constellation will consist of three identical satellites, in geosynchronous orbit spaced approximately 120° apart, which will operate at Ka-band and provide global coverage and innovative broadband availability. GX will provide a variety of two-way communications services to small user terminals, under the ESOMPs (Earth Stations on Mobile Platforms) framework, including broadband Internet access, multimedia, voice and other applications. The regulatory framework for ESOMPs is currently being developed by CEPT, with the equipment standards being developed by ETSI.

The GX satellites are currently under construction by Boeing and the launch of the first one, with coverage of Europe, is planned for 2013. In addition to the global payload, which will use satellite exclusive bands, the GX system also has six high capacity beams per satellites which will operate, in the 19.2-19.7 GHz (downlink) and 29-29.5GHz (uplink) bands. These bands are also allocated to the FS. Deployment of these beams will allow essential extra capacity when and where needed. Ireland is particularly important because of its geographic location. It is in fact a convergence point for transatlantic aeronautical traffic and has a large fishing industry. It is therefore likely to require additional capacity that would, in turn, require use of the band 29-29.5 GHz for satellite uplinks. Inmarsat therefore recommends that FS systems are not introduced in the 28 GHz band and in particular that the use of the band 29-29.5 GHz for terrestrial systems should be avoided to allow for the deployment of GX services in and around Ireland.

This band has been licensed for FS systems by some other countries in CEPT, however the number of links deployed is quite low (around 2500 links and 180 p-mp base stations in CEPT) – see draft ECC Report 173.

In Ireland, not only are there currently no FS links in this band, leaving ample flexibility for its use by satellite systems, but a number of alternative bands are available for FS which can free some of the spectrum at the more congested lower frequencies. ComReg has identified eight new FS frequency bands which could be alternatives to the 28 GHz band. In contrast, the use of alternative frequency bands for satellites is quite limited and frequencies above approximately 50 GHz are clearly not suitable.

6: UPC Ireland

Q. 1 Please state your views regarding the current and proposed search parameters for the 23 GHz and 26 GHz bands as well as for existing and new frequency bands

providing technical proof in support of your views as appropriate.

To date, UPC have not encountered any issues when planning fixed radio links in either the urban and rural environment, however, UPC does recognise that limitations are likely to exist when planning within the main urban areas. UPC agrees that Comreg's proposal to limit the antenna size could allow for a reduction in the search radii, however, careful consideration would then need to be given to the technical specifications of the antennas used as the smaller antennas are likely to have lower rejection specifications.

Q. 2 Is the High/low interference radius the only issue that needs resolution before ComReg can consider releasing further national block licences in the 26 GHz band at some future date?

UPC are not aware of any other issues that need to be resolved at this time.

Q. 3 What are your views regarding the potential for permitting higher bandwidths in current fixed links bands?

It is UPC's view that Comreg should license higher bandwidths channels to their maximum potential as per the table below.

Frequency Band (GHz)	Raster (MHz)	Minimum Transmission Capacity
13	56	2 x STM-1

15	56	2 x STM-1
18	110	4 x STM-1
23	112, 56	4 x STM-1, 2 x STM-1
38	112, 56	4 x STM-1, 2 x STM-1

Furthermore, UPC agrees that 56 MHz channel spacing is supported by most equipment vendors and that the licensing of dual polarisation links utilising 56MHz Bandwidth would allow operators meet their capacity requirements while ensuring spectrum efficiency

UPC also agrees that channel aggregation is a very efficient way to increase microwave link throughput.

Q. 4 Would you welcome the opening of these three frequency bands? Are there any additional bands that ComReg should also consider? Support your answer.

UPC would welcome the opening of the 28GHz, 31/32GHz and 40GHz bands. Furthermore, UPC agrees with the proposal for ComReg to prioritise the opening of the 28 GHz and 32 GHz fixed link bands followed by the 40 GHz fixed link band as vendors currently support both the lower bands.

UPC feels that if Comreg is to permit the licensing of block frequencies in existing frequency bands, it is important that any new frequency band will also be considered for both the licensing of individual links as well as national block licences. It is also important that these bands be licensed up the 56MHz Channel raster.

Q. 5 Please state your views regarding opening part of the new frequency bands for Point To Multipoint use.

It is UPC's view that these bands should be considered for Point to Multipoint use in high usage urban areas. UPC believes that as the frequencies bands in questions are higher up the spectrum, there would be no economic benefit in licensing these bands for P-MP links in rural parts of the country.

7: Vodafone Ltd



Vodafone Response to the ComReg Survey on Fixed Links

Introduction

Vodafone appreciates this opportunity to comment on the proposed areas of reform as previously set out in ComReg consultation document 11/88. We broadly support the implementation of the measures proposed, some of which we raised as part of the consultation process preceding the publication of ComReg's Spectrum Strategy for the period 2011-2013, as they widen the scope for fixed radio link users to increase the efficiency of use of the spectrum. The proposed measures should also increase flexibility of spectrum use – the benefits of which will, in a competitive electronic communications sector, ultimately accrue to end users of retail communications services (consumers and businesses) in terms of lower prices and an enhanced service experience.

Response to Survey Questions

Q1. Please state your views regarding the current and proposed search parameters for the 23 GHz and 26 GHz bands as well as for existing and new frequency bands, providing technical proof in support of your views as appropriate.

Vodafone strongly supports the implementation of the possible solution proposed of limiting the antenna size to a maximum of 0.6 metres on links in urban areas. This solution based on the equation and calculation in paragraph 4 of ComReg document 12/10 is technically valid.

This measure would not negatively impact the performance of links in urban areas but will promote the re-use of spectrum. Vodafone anticipates that in the future there will be a requirement to infill sites in urban areas to facilitate very high capacity mobile solutions. There will also be a requirement to increase the channel bandwidth of MW Radio systems to meet those bandwidth requirements. We consider that the above approach, by improving the re-use of the available spectrum in those areas, will facilitate the delivery of advanced mobile data services in a cost effective and spectrally efficient manner.

Vodafone believes that as a necessary part of the implementation of this approach ComReg may need to modify its online registration process, and it will also be a requirement to clearly delineate those urban areas within which the reduced interference radius will be permitted. We would welcome further engagement with ComReg on the detail of these measures.

Q2. Is the High/low interference radius the only issue that needs resolution before ComReg can consider releasing current national block licences in the 26 GHz band at some future date?

Yes. Vodafone considers that there are no other material issues that need to be addressed.

Q3. What are your views regarding the potential for permitting higher bandwidths in current fixed links bands as shown in Table 2?

Vodafone welcomes the proposal for allowing higher bandwidths in existing fixed links bands. The requirement for higher bandwidths is being driven primarily by the improvements in mobile technology. HSPA and LTE will increase the capability of mobile network speeds up to 200Mb\’s and above. The microwave network will be required to support such technologies in the access networks, and as such higher capacities are required. Current configurations using 28 MHz channel bandwidths and 256 QAM modulation schemes limit the net throughput of Radio systems to below 200Mb\’s. In an aggregation scenario where multiple sites are transported over the same MW link, upwards of 300Mb\’s would be required at a minimum to support anticipated peak data speeds (given consideration for statistical gains due to user behaviour).

It is important that operators can deliver this capacity while maximising the reuse of the installed network. Vodafone, whenever possible, deploys the most spectrally efficient equipment available from the equipment vendors. **[Confidential Information Removed]**

Q4. Would you welcome the opening of these three frequency bands? Are there any additional bands that ComReg should also consider? Support your answer.

Yes, Vodafone would welcome the opening of the 28 GHz, 31-32 GHz and 40 GHz bands for the reasons of equipment availability and scope for pan-European harmonised use cited by ComReg. However we would also emphasise the importance of ComReg maximising the utilisation of existing opened bands. In particular Vodafone believes that there is scope to assign blocks of spectrum in the 38 GHz band for use in congested areas.

Of the 3 bands proposed for release by ComReg, we consider that the **[Confidential Information Removed]** band is the most attractive given its propagation properties and the fact that other large European telecoms operators already use this band. This ensures that all vendors include this band on early roadmap releases. The **[Confidential Information Removed]** band also has a larger channel assignment than the other bands, and is therefore feasible for use by multiple operators who wish to use channel bandwidths up to and including 112 MHz without significantly limiting expansion options in the future.

As indicated in the response to question 3, LTE and future technologies will drive the requirement for large capacity MW Radio systems and will, in dense urban areas, make frequency reuse very difficult particularly for very high capacity feeder links (> 56MHz). In this case having an additional "clean" band would allow operators the flexibility to meet the capacity demands of LTE in the medium term.

Q5. Please state your views regarding opening part of the new frequency bands for Point-to-Multipoint Use.

[Confidential Information Removed] we have no specific objections to operators using Point-to-Multipoint technology in an assigned area of part of the bands.

Q6. Please state your views regarding the current technical conditions for fixed links.

Vodafone's principal goal in its use of fixed links is to ensure the maximum reuse of channels within the assigned spectrum. This is achieved by ensuring we deploy, wherever possible, the most spectrally efficient equipment available from vendors, and employing the minimum output power necessary to meet the required availability target. The proposal to reduce the interference radius for the 23 GHz and 26 GHz bands will support that goal and ensure the maximum re-use of channels in those bands.

Vodafone has no additional comments to make regarding the existing technical conditions for fixed link licences.

