

# Can broadband wireless access and C-band co-exist?

BY ROBERT W AMES JR.

**PUNTA GORDA, FLORIDA** – With the deployment of broadband wireless access (BWA) services such as WiMax gaining momentum in several countries, the potential for severe interference problems with satellite communications operating within the “extended C-band” frequency is increasing exponentially.

The C-band frequency is used worldwide by fixed satellite services (FSS) operators to deliver distance-learning, telemedicine, disaster recovery, TV transmission, meteorological and earth observation services, and also by certain military services. There are approximately 160 geostationary satellites currently operating in the C-band frequency worldwide. Furthermore, two out of every three commercial satellites under construction today will likely be utilising C-band frequencies.

BWA equipment will operate within the 3.4-3.7GHz ranges of the FSS extended C-band frequency. This can present problems to satellite systems with overlapping bands, susceptible to out-of-band emissions and LNA/LNB saturation. Industry analyses and early tests of potential BWA interference all point to a significant threat to satellite services operating in C-band. By way of illustration, a BWA field trial in Hong Kong inadvertently knocked off the TV-signal feeds to an estimated 300,000 households throughout Asia.

“The satellite industry is currently facing a global crisis,” said David Hartshorn, secretary

## association update

in general, Global VSAT Forum (GVF). “Communications companies and governments throughout the world have increasingly been reporting incidents where fixed and mobile satellite services are being severely disrupted by interference from terrestrial wireless services in the extended and standard C-band frequencies.”

### Where we are

Several prominent industry organisations are actively involved in actions to address this issue:

The Asia-Pacific Broadcasting Union (ABU) submitted a contribution to the ITU (International Telecommunication Union) proposing that relevant ITU-R Study Groups and Working Parties urgently study the implications of BWA implementation, with a view to recommending technical and regulatory mitigation techniques as appropriate (*Interference to FSS Satellite, Satellite TV, Reception in 3.7-4.2GHz*, document 4-9S/167-E).

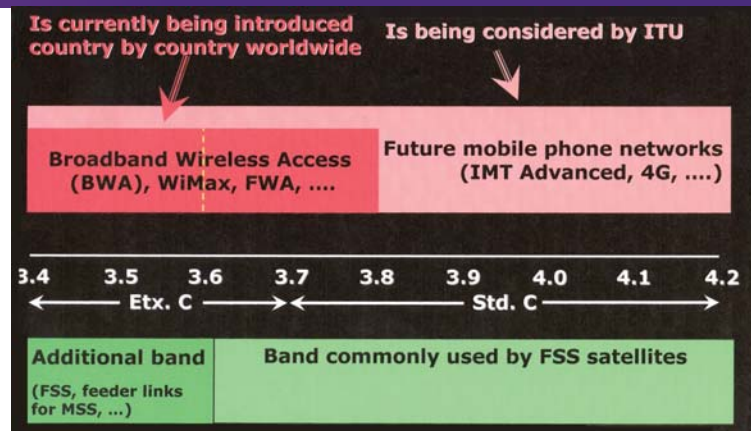
During the fourth Meeting of the Asia-Pacific Telecommunity (APT) Wireless Forum in January 2007 in Bangkok, Thailand, the APT submitted a paper, entitled *Report on the co-existence of Broadband Wireless Access in the 3.4-3.6GHz Band and Fixed Satellite Service in 3.4-4.2GHz Band* (document AWF-IM3/10). The paper detailed studies conducted on and the technical implications of co-existence of

the two services.

Also weighing in on the issue of terrestrial wireless applications in the C-band, the Global VSAT Forum (GVF) held a summit, “The US\$20 Billion Question: Can Satellite and Terrestrial Wireless Co-Exist in C-band?”, on 29 September 2006 in Washington, DC, USA. Government, industry and other key stakeholders participated in the high-level briefings and developed a coordinated strategy to avert further interference. The resulting paper, entitled *C-Band Spectrum Threat to Satellite Services*, cautions that satellite operators, particularly in regions such as Africa, Asia and Latin America who rely heavily on C-band for satellite services, would be severely affected by any initiative to deploy mobile broadband services in C-band.

The Asia Pacific Satellite Communications Council (APSCC) is also extremely concerned with this issue. APSCC recently issued a paper, adopted by the International Associations of the Satellite Communications Industry, stating: “National administrations should recognise the potential for massive disruptions to C-band satellite communications, radar systems and domestic microwave links, if spectrum is inappropriately allocated to, and frequencies inappropriately assigned for, terrestrial wireless applications in the C-band (specifically 3.4-4.2GHz).”

A consortium of major satellite operators including Intelsat, SES Americom, Telesat, SES NewSkies, and AsiaSat are vigorously engaging the ITU and other regulatory administrations worldwide on this critical issue.



WiMAX and FSS frequencies.

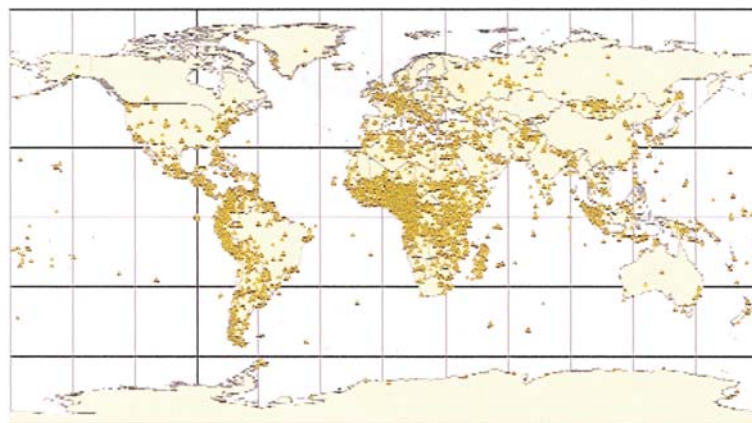


Figure 2

Deployment of earth stations registered with one major satellite operator and receiving within the 3,400-4,200 MHz band.

Satellite operator Thaicom and the Thai administration have been actively opposing WiMax in C-band, while Pakistan and the Philippines have put deployment of C-band WiMax on hold. On the other hand, India, which ordered satellite operators to “vacate the band”, received a deluge of complaints from cable operators, satellite operators and programmers and is now reconsidering its position.

### Where we need to be

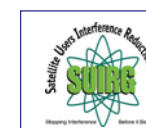
Compatibility testing to date has been performed without the cooperation of the WiMax Forum. SUIRG has taken the initiative to perform WiMax testing adjacent to a non-operational earth station to further quantify the compatibility issues. The test, planned for the July/August 2007 timeframe, will be conducted in cooperation with Intelsat, SES Americom, SES NewSkies, AsiaSat, and the US Navy.

The satellite industry is committed to defining the impact of sharing the C-band frequencies and identifying if — and how — fixed satellite services and wireless services can co-exist. To preserve the viability of global satellite communications, we urge the international community to maintain the current ITU allocation status on C-band, and strongly recommend the examination of alternative frequency bands for broadband wireless services. We entreat all national administrations to make a concerted effort to achieve this result.

SUIRG also reiterates the requirement that all FSS earth station antennas, including receive only, be registered prior to WiMax deployment to minimise interference incidents. This position appears to be tacitly sup-

ported by the WiMax Forum, which stated in a recent position paper addressing sharing of the FSS frequency spectrum: “The general conclusion drawn is that the ease of deployment of WiMAX systems in the 3.3-3.8GHz band is very much dependent on the extent to which satellite earth stations are already deployed in the country concerned, and the amount of spectrum that the FSS is allocated in each country.”

\*SUIRG wishes to thank the GVF, APT, APSCC and CASBAA for permission to cite their respective filings and position papers on this critical issue.

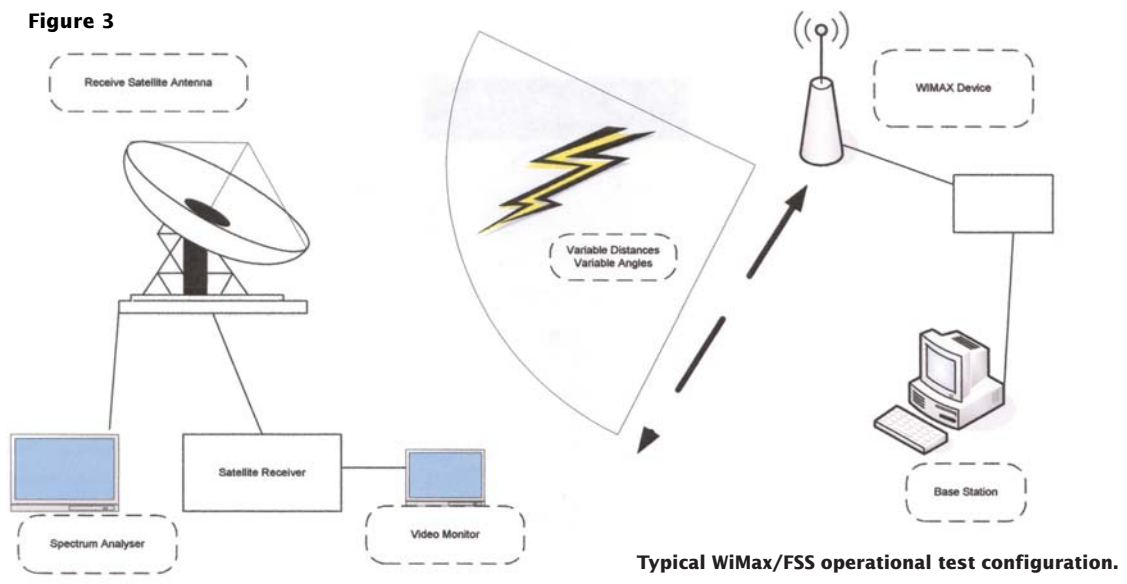


Robert W Ames Jr is president of the Satellite Users Interference Reduction Group (SUIRG). SUIRG is an international not for profit assembly of parties with representation from both the private and public sector, organised to combat the increasing and costly problem of satellite radio frequency interference. The Group's membership is comprised of satellite operators, users, uplinkers, service providers, equipment vendors and other organisations with a stake in combating radio frequency interference. SUIRG also collects interference incident data from satellite operators on its web site to clearly define the specific areas that need focus to reduce the number of incidents.

www.suirg.org.

The Satellite Users Interference Reduction Group (SUIRG) will alternate with the Asia-Pacific Broadcasting Union and CASBAA to appear in every other issue of APB, highlighting various association news to the industry.

Figure 3



Typical WiMax/FSS operational test configuration.