

**TITLE: Satellite Communication in Ghana-challenges and prospects  
By**

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### **Abstract**

Busy Internet is a Ghanaian ISP that uses satellite connectivity to bring Internet to West Africans. The operations of this ISP illustrate the reliability, versatility and efficiency of, VSAT, (Very Small Aperture Terminal) networks in delivering fast broadband Internet services. This paper discusses technical, economic and regulatory issues relating to satellite networks as a means of bringing Internet to Ghanaians, and the challenges confronting the country's National Communication Authority and the Ministry of Communications.

## **Waking up to the Call**

Satellite communication was not an integral part of the Ghanaian communications system until the early 1980s. Prior to 1981 communication within Ghana and between Ghana and the outside world was not very effective. The country relied on aging Plain Old Telephone Service (POTS) Lines for voice, and terrestrial microwave networks for radio, and television. International voice, video and data communications links were limited, with most of such communications services operated by the government run telecommunications monopoly.

The construction of a satellite earth station at Kuntunse in the Eastern region of Ghana in 1981, and related communication reforms of the early 1990s marked a dramatic shift towards greater use of satellite communications technology over the next two decades. Satellite earth stations and connecting equipment were installed by private and state entities dramatically increasing, voice, data and video services. Today, Ghana operates a fairly opened communication industry, having privatized some institutions, and encouraged both private domestic and foreign investors to participate in the communication businesses. This has resulted in the establishment of firms that provide a variety of voice, video and data services to meet the growing communication demands of the Ghanaian citizenry.

In meeting the needs of Ghanaians in the information age, satellite communications has emerged as a preferred means of Internet connectivity. This is evident in the fact that leading Internet Service Providers (ISPs) such as

Network Computer Systems (NCS), Tin-Ifa and Busy Internet rely on satellite to get them connected to the World Wide Web. Busy Internet boasts that it is the fastest broadband Internet service in Ghana. The operations of Busy Internet illustrate how VSAT as a form of satellite communication can help unleash the full potential of Ghana's communications industry through a combination of innovative technologies, good business practices and sensible regulatory policies.

### **VSAT Internet Connectivity**

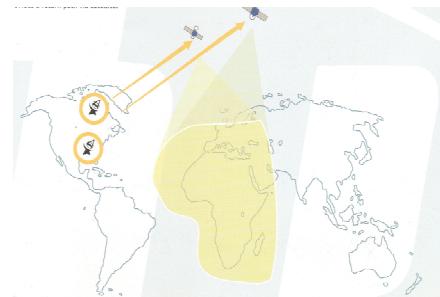
Satellite communication has proved to be one of the most reliable and quick options for developing countries like Ghana to bring new media and telecommunications to their communities. Ghana's Busy Internet connects directly to the Internet backbone in the US through C-band satellite using Very Small Aperture Terminal (VSAT). C-band like the L, Ku and Ka bands are satellite frequencies designated by the International Telecommunication Union for the distribution of voice, data and video communication signals. The C-band frequency spans between 4/6 GHz and is used to support telephony, broadcast, cable TV and other business communication services.<sup>1</sup> VSAT satellite space segment providers offer three types of satellite beams: spot, hemispheric and global. Spot beams are currently available in both Ku-Band (12-16 GHz) and C-band (4-6 GHz). Spot beams are generally high power, thus allowing smaller antenna dishes to be used at remote sites. Hemispheric and Global beams have a much larger footprint and weaker signal strength.<sup>2</sup> These frequencies are noted

for their fairly good resistance to rain attenuation and suitability for the tropical climate of Ghana and parts of Africa that experience seasonal heavy rainfall.

### **Busy Internet**

Busy Internet is a joint Ghanaian (45%) and British (55%) business venture that uses the IP Planet satellite communications platform to bring Internet services to its customers. It subscribes to IP Planet's service through the company's local agent Ecoband,<sup>3</sup> a reseller of satellite communications services.

Through Ecoband IP Planet, an Israeli company with operations in USA, Holland and Israel facilitates Busy Internet operations through a constellation of North American based satellites with footprints covering the whole of Africa. Ecoband feeds a number of VSAT networks in Ghana and elsewhere in Africa. IP Planet is part of the Eurocom Group, Israel's largest privately held communications company.<sup>4</sup>



This image is an illustration of IP Planet's Internet backbone over Digital Video Broadcasting (DVB) Satellite supported by the company's operation in the US. Source: IP Planet's company profile brochure.

VSAT networks use geostationary satellites orbiting in the equatorial plane of the Earth at an altitude of 35, 786 km to connect data (signals) from a network of remote sites to a data hub.<sup>5</sup> The satellite communication system offered by Ecoband guarantees Busy Internet and similar customers bandwidth at speeds ranging from 64Kbps to 48Mbps, with the possibility of providing for "Burst capacity" when necessary.<sup>6</sup> After three years of hosting Internet and other multimedia services at its premises, Busy Internet has expanded its role as an

ISP (Internet Service Provider). It is now offering personalized Internet service delivered through VSAT network installed on home and business premises.

According to Mark Davis, the CEO of Busy Internet, September 2003 marked the beginning of business site installation.

Davis indicated that

“One of the things we have realized is that people do respect Busy Internet, they like the brand.... To capitalize on that we can move into other kinds of businesses...we are doing it very cautiously...it will be very small and very focused. It will be high quality service for a limited number of customers. And that is how we are moving on with these new licenses and new technologies and trying to grow our revenue base and our services.”<sup>7</sup>

Prior to September 2003 Busy Internet’s traditional services to Ghanaians had



A section of the Cyber café at Busy Internet’s business center in Accra. Source: <http://busyinternet.com>

been its 100 PC Cyber Café and 24 hour digital copy centre. The provision of ISP services on the premises of customers is a diversification of its operations. The company charged ₵5000.00 (US \$0.58) for 30 minutes browsing or use of a computer

terminal at the business center, the estimated charge for its new Internet services to be delivered to the premises of customers is yet to be determined.

The greatest challenge facing most ISPs and especially the Cyber Cafés is regulation in terms of licensing and annual fees charged by the NCA (National Communication Authority) the regulatory agency in Ghana.

Davis indicated that the NCA has difficulty understanding:

“the implications of certain technologies and how to regulate them. For example a VSAT will cost you \$8,000 or \$4,000, and unfortunately that is the only way you can get connectivity in the rural areas in Ghana. No small cyber café can afford this... [and the cost of] a big license fee. They will have to understand that, and I

am sure they will be sympathetic. These satellite dishes are no longer \$30,000 and restricted to big corporations.”<sup>8</sup>

### Concerns of VSAT Operators

VSAT operators in Ghana feel constrained by the licensing and government fees required of them.

From the satellite operators point of view local regulators and policy makers are not sensitive to

amount of money that must be invested to make these technologies available.

Add-on fees and charges could be reduced. Alexander Sulzberger of Ecoband explained the problem in this case. He said

“reaching the remote areas and smaller regional capitals by satellite is still a big hurdle. We have a license fee for VSAT communications that is quite expensive. We pay roughly about \$10,000 to \$12,000 in the first year to apply for and obtain our license and then we have an annual site fee of about \$4,000 which is prohibitively expensive, if you add these to the cost of VSAT equipment, installation fee, and the bandwidth charges on it”<sup>9</sup>

According to Sulzberger a small link for a rural community communications center requires equipment costing between \$5,000 and \$10,000, then there are service charges of about \$500.

VSAT operators in Ghana would like to see the NCA and the Ministry of Communications differentiating between operators of big medium and small size. Given that the traffic capacity of satellite dishes vary depending on their bandwidth, the licenses, and annual fees charged on them could be made to reflect such differences. Government imposed costs are a major draw back in the attempt to provide Internet services to Ghanaian and other African communities.



Busy Internet building in Accra which also houses Ecoband Networks the resale agent of IP Planet. Source: <http://busyinternet.com>

Deployment of such services requires a huge capital investment in equipment and in installations. Attention needs to be focused on providing incentives to those entities and individuals willing to commit their resources to bringing new media and communications services to the country. The discussion on incentives has mostly been focused on tax incentives, but other forms of incentives could be considered. For instance, creating Designated Market Areas (DMA) for service providers to assure them of a fair share of the market and allowing Internet service providers to offer VoIP (Voice over Internet Protocol) could help diversify their streams of revenue and ensure their success.

The NCA and the Ministry of Communication need to decide on VoIP. Voice over Internet is an attractive option for Internet users because of the lower cost. VoIP is a potential incentive for VSAT operators, who are currently limited to data service. Having government offices better understand the capabilities of VSAT satellite communications for economic and social developments is crucial to the development of communication infrastructure throughout Africa.

### **NCA and Regulatory Challenges**

The regulatory environment of the communications industry in Ghana has played a significant role in the establishment of communications service providers like Busy Internet, Ecoband, NCS and Tin-Ifa. Describing the Internet industry in Ghana, Alexander Sulzberger the CEO of Ecoband pointed out that, “Ghana is in a unique position if you look at the surrounding West African countries. In Ghana it was from the beginning the private sector that developed the Internet business [and] not so much the government owned Telecom as it is in the Francophone countries where the PTT is the biggest ISP.”<sup>10</sup>



It is evident from these statements that private initiatives and regulatory reforms have driven the development of the Internet industry, and are expected to continue driving the industry should the regulatory agency address pertinent industry concerns.

The political and economic changes that took place in Ghana after the adoption of the 1992 Constitution, and the communications reforms that led to the drafting and passing of the National Communications Authority Act and establishment of the NCA in 1996, helped create an industry driven by private investment initiatives. It became easier for satellite communications firms to register and operate as communications service providers in Ghana. Obtaining a VSAT license in Ghana is now a simpler process than in many other African countries. Consequently, satellite communications networks have been able to provide alternatives to the existing congested POTS networks operated by the former PTT, Ghana Telecom, and Westel, its competitor after the reform. Multichoice (TV and Video), and Spacefon (Voice) are two of the successful private firms using satellite platforms to deliver pay-tv and mobile services to Ghanaian customers.

The first private commercial ISP, NCS, started in Ghana in 1995. Communications development has reached the point where regulatory further reform is needed to ensure further growth and expansion of the industry. It is evident that the POTS networks cannot be relied upon as the sole source for the delivery of Internet service to Ghanaians. Satellite and wireless connectivity solutions must be used to complement existing telecommunication networks. The

T1 line is standard for physical wire cabling used in telecommunications networks.<sup>11</sup> The bandwidths of 1.54 Mb/s provided by T1 lines are rapidly becoming insufficient to meet the demand and the Telecom lines do not go everywhere.

Although Ghana Telecom is a partner to the SAT 3<sup>12</sup> fiber optic cable project in Africa, Ghana currently lacks the nationwide cable or fiber optic networks to deliver Internet services to home premises and businesses. Bernard Forson jnr, the deputy director general of NCA, had this to say on the issue,

“If roads are being built why cables can’t be put under the roads? Railroads are being built why cannot railroads have cables under the railroad? Buildings are being built, why cannot they [be required to follow] certain communications codes and have positions on top...for ports for data communications services? The whole building could be mandated or coded to have a certain amount of infrastructure running through it so we can start building local exchange entities. You can have one building well set, the land belongs to government, and the building belongs to private sector, mandate [d] by law to allow collocation. That will allow multiple players to come in and compete on the service site.”<sup>13</sup>

Building effective communications networks in Ghana requires planning and regulatory guidelines. Forson’s statement is a testimony to this fact.

For new technologies to bring economic growth, the regulatory mechanism will have to be streamlined in Ghana. The NCA’s board of directors was only recently fully constituted. According to The Daily Graphic a leading newspaper of Ghana, the seven-member board consist of Jude Arthur (Chair), Isaac Botwe, Stephen Ayesu Gyimah, W.K. Baffoe-Mensah, Mohammed Sani Abdullah J.R.K. Tandoh and Edward A. Boateng.<sup>14</sup> The Ghana government has indicated its readiness to publish its Accelerated Development Plan (ADP) in late 2003. This plan is expected to help guide industry practice. Significant steps

have been taken additional market and management initiative should be jointly taken by the NCA and the Ministry of Communication to facilitate private investment, so that practitioners can expand their operations. This will greatly help the growth of the Ghanaian telecommunications industry, and benefit both consumers and businesses.

A constraint for ISPs in Ghana is the existence of rules that prevent VSAT operators from providing value added services like VoIP. To enable industry players to plan, negotiate and implement business strategies, the NCA should lead the government of Ghana to address the following issues.

1) The NCA should recommend that government create Designated Market Areas (DMAs). Ghana is still considered one big market even though communications businesses are concentrated in cities like Accra, Kumasi and Takoradi. Service providers focus their attention on these cities, and new players all seek to break into these urban markets. Dividing Ghana up into DMAs will give the licensing agency a way to encourage service providers to select areas of operations where competition is less. Should the Ghanaian market be divided into sectors, the regulatory agency could offer incentives to VSAT operators and others to deploy in the underserved and rural communities.

2) The NCA should work to promote “dynamic competition” as opposed to “static competition” within the industry.<sup>15</sup> Dynamic competition allows competing technologies and new products to challenge the old ones and, if they are really better to replace them....New technologies can render instantly obsolete billions of dollars of embedded infrastructure, accumulated over decades.”<sup>16</sup>

Understanding this reality will enable operators using VSAT and other satellite technologies to compete effectively against the protected former

telecommunications monopoly. Competition in the communications industry in Ghana is now taking shape, and government needs to give it the boost it deserves. To facilitate competition requires government understanding the dynamics of competition. Ghana Telecom's position as a government controlled entity (the government owns 70% of the company's stock) and the biggest telecommunications service provider needs to be addressed to ensure that it does not continue to exert undue influence on the industry. "The challenge for policy... is to permit, [and] even encourage, dynamic competition in every aspect of the cyberspace market... [And] the challenge for government is to encourage this shift- to create the circumstances under which new competitors and new technologies will challenge the natural monopolies of the past."<sup>17</sup>

3) Together with the Ministry of Communication, the NCA should define Ghana Telecom's status either as an ordinary operator or as a common carrier. The role of other telecommunications entities in Ghana should be categorized so as to determine their obligations roles as content and service providers. According to Patricia Aufderheide, author of a 1999 book on Communications, Policy and the Public Interest, a common carrier is a business, such as a telephone company or a railroad, required to provide service to any paying customer on a first-come first-served basis.<sup>18</sup> The NCA should recognize that industry players are not equal in size, so as to ensure competition and effective deployment of services by eliminating the possibility of larger operators taking undue advantage of smaller ones. Functions should be more clearly defined so that services can be made available to the whole country.

4) Guidelines related to standardization, interconnections, arbitration and negotiations should be drafted and made public. Such rules eliminate much of the bureaucracy and the unfavorable business relations that exist between the big and smaller operators. The NCA needs to enforce mediated agreements. Currently the communications industry in Ghana is stifled by the absence of well-defined regulatory rules to guide industry practice. VSAT operators are ready to compete with old technology industry players. Ecoband, the satellite reseller is ready to deliver service to the Accra based ISP Busy Internet. They like all VSAT operators in Ghana deserve a fair regulatory deal to respond to the public demand for faster more convenient Internet service that has emerged in Ghana as a result of satellite technologies.

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<sup>1</sup> Lin, C. (2000). Satellite communications. In (Eds) August E. Grant & Jennifer Harman Meadows. *Communications Technology Update*. Boston, Massachusetts: Focal Press, pp-247-256.

<sup>2</sup> Maral, G. (1995) as cited in Jackson, M.E. et al, (2002), Real-time GPS data transition using VSAT technology, *GPS Solutions*, Vol. 5, No 4, pp. 10-11. .

<sup>3</sup> Ecoband is a joint Ghanaian and European venture.

<sup>4</sup> IP Planet, Company Profile brochure, 2002.

<sup>5</sup> Maral, G. (1995) as cited in Jackson, M.E. et al, (2002), Real-time GPS data transition using VSAT technology, *GPS Solutions*, Vol. 5, No 4, pp. 10.

<sup>6</sup> Features and Benefits: <http://ecoband.net>

<sup>7</sup> Excerpt from an interview with Mark Davis on 19 August 2003 in Accra Ghana.

<sup>8</sup> Excerpt from an interview with Mark Davis on 19 August 2003 in Accra Ghana.

<sup>9</sup> Excerpt from an interview with Alexander Sulzberger on 4 August 2003 in Accra Ghana.

<sup>10</sup> Excerpt from an interview with Alexander Sulzberger on 4 August 2003 in Accra Ghana.

<sup>11</sup> Glossary *Communications Technology Update* (Eds) August E. Grant & Jennifer Harman Meadows. Boston, Massachusetts: Focal Press, p. 346.

<sup>12</sup> SAT 3 is a South African and Portuguese initiative, involving about 42 other African countries that have invested in the laying of fiber optic cables around Africa aimed at linking Africa to the global information grid through Portugal. A similar project that started earlier, Africa One, was a disaster.

<sup>13</sup> Excerpts from an interview with Bernard Forson jnr, on 8 August 2003 in Accra Ghana.

<sup>14</sup> Daily Graphic, July 19, 2003 edition. Accra, Ghana: Graphic Communications Group Limited. pp 1&3.

<sup>15</sup> Dyson, E., Gilder, G., Keyworth, G., & Toffler, A. (1994, August). *Cyberspace and the American dream: A Magna Carta of the Knowledge Age*. Washington, D.C.: Progress and Freedom Foundation.

<sup>16</sup> Dyson, E., Gilder, G., Keyworth, G., & Toffler, A. (1994, August). *Cyberspace and the American dream: A Magna Carta of the Knowledge Age*. Washington, D.C.: Progress and Freedom Foundation.

<sup>17</sup> Dyson, E., Gilder, G., Keyworth, G., & Toffler, A. (1994, August). *Cyberspace and the American dream: A Magna Carta of the Knowledge Age*. Washington, D.C.: Progress and Freedom Foundation.

<sup>18</sup> Glossary *Communications Technology Update* (Eds) August E. Grant & Jennifer Harman Meadows. Boston, Massachusetts: Focal Press, p. 333.