



What does the future hold?

Developments in antenna technology have taken satellite communications to a new level. Antennas come in all shapes and sizes and they perform many different functions. Satellite Evolution Asia finds out what is new in the world of satellite antennas and takes a peep into what the future holds.

Developments in antenna technology have taken satellite communications to a new level. Antennas come in all shapes and sizes and they perform many different functions. They are a critical part of the satellite network. Advancements in communications technology such as comms-on-the-move are pushing manufacturers to constantly innovate. Demand placed on antennas is causing manufacturers to change their shape, to make them highly portable and able to be

dismantled. Therefore the material the antenna is constructed of must be lightweight and easy to transport.

These days, the large, immovable antennas are a thing of the past meaning that satellite communications can be attained just about anywhere on the planet.

What are the new antennas available in Asia and what is generally new and innovative antenna design in the industry?



Affordable antennas

In Asia particularly, the DTH industry is hugely significant in terms of antenna manufacturing. In India especially, demand is growing by the minute with two million subscribers already taking up the newest DTH platform, TaTa Sky platform. In addition, there are several other platforms such as ZE TV, Dish TV and Doordashan. With at least two more platforms scheduled for launch in the near future, this demand shows no signs of slowing.

Elsewhere in Asia, Shin Broadband Internet, recently announced the launch of its brand new product named 'DTV'. DTV is the Ku-band satellite dish set able to receive free-to-air television programmes with no monthly fees with the concept of "An affordable Satellite TV Dish for Every Home". The DTV satellite dish set is the lowest cost product in Thailand and the region. Shin Broadband Internet also launched the special DTV Fantastic Caravan vans to promote the product in four regions of Thailand. The Company aims to install up to one million DTV dishes across the country within the year 2008.

The satellite dish can be easily installed by a technician. Viewers no longer need to use the Yagi aerials, which are more expensive and emit lower quality signals. According to Shin Broadband's latest marketing survey, most Thai TV viewers still predominately watch free-to-air channels and do not want to pay monthly fees.

Shin Broadband Internet, a satellite applications developer, has been developing DTV, a low-cost Ku-band satellite TV dish set, since 2006. The aim was to build a very low-cost satellite TV antenna system that makes it affordable to all households. The product also is high performance with high signal quality and sharp pictures with brilliant colours. The most important point of all is that there are no monthly charges and viewers can receive all free-to-air Thai TV channels with digital quality.

At present, there are many Thai TV viewers with typical Yagi aerials that give an unsatisfactory picture quality. In addition, to set up a high Yagi aerial is quite costly with no guarantee of receiving sharp pictures for all channels. TV is still the most popular and cheapest form of entertainment in Thailand and so Shin Broadband saw an opportunity to find a solution to benefit TV viewers across the country. The DTV product can receive all free-to-air Thai TV programmes directly from the THAICOM satellite in crystal clear digital. Many households, especially in the remote areas, where normally a very high Yagi aerial needs to be erected, will benefit greatly.

After the launch of DTV, Shin Broadband plans to expand its distribution channels into the grass roots in order to cope with the high demand. The Company launched pre-marketing and sales activities of the DTV product a few months ago and the demand has been enormous. Shin Broadband is therefore confident that it can reach the target of deploying one million DTV sets in 2008.

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ViaSat acquires JAST Antenna Systems

ViaSat Inc. has agreed to acquire privately-held JAST Antenna Systems. JAST develops microwave circuits and antennas for terrestrial and satellite applications, specializing in small, low-profile antennas for mobile satellite communications.

Terms of the transaction include an initial purchase price of approximately US\$2.0 million and additional consideration of up to US\$4.5 million to be paid in cash and/or stock based on JAST meeting certain financial performance and technology development targets over the next two years. The acquisition is expected to have no material impact to ViaSat non-GAAP (pro forma) earnings during the next twelve months. However, ViaSat has not completed its valuation analysis and, accordingly, has not determined the impact to GAAP earnings. The acquisition is expected to be completed within 30 days.

"ViaSat has been working on a number of attractive market opportunities in mobile satellite and terrestrial communication markets," said Mark Dankberg, ViaSat Chairman and CEO. "JAST has expertise, innovative technology, and market relationships that improve our competitive position in these markets. And, their location in Switzerland can help us better support our European partners and initiatives."

"Becoming part of ViaSat opens up many new possibilities for our antenna technologies and the strong complementarity of the technologies will strengthen our position in the worldwide market," said Ferdinando Tiezzi, JAST Managing Director. "We share a common culture of innovation and vision in the future of mobile satellite communications. The new strength this merger brings us will be especially valuable in further advancing our mobile antenna technology and capturing market share going forward."

JAST provides innovative low-profile antennas for in-motion satellite telecommunications ranging from L-band to Ku-band. Based on phased array technology, JAST products connect retail, enterprise, governmental and military customers to global satellite networks. The Company has core competencies in the development of innovative microwave circuits and antennas for terrestrial and satellite applications. JAST engineering and manufacturing expertise allows it to provide customers with high quality products and services with the highest Swiss excellence. JAST is based in Lausanne (Switzerland) and has been founded as a Spin-off of the Laboratoire d'Électromagnétisme et d'Acoustique (LEMA) of the Swiss Federal Institute of Technology of Lausanne (EPFL). JAST is involved in several ambitious research programs for the development of innovative systems in the field of satellite communication at European level.

The DTV set costs Bt.1,925 (approximately US\$55) excluding installation costs. Currently, DTV is available in 400 stores. However, Shin Broadband is eager to expand up to 1,000 distribution stores nationwide. This is good news for those who wish to receive quality at a low price – affordability for all.

COTM

Shin Satellite have also been moving into the communications-on-the-move market with a new product – iMOVE. They joined forces with RaySat, a privately held US company, in 2006 to offer the most powerful mobile broadband 'on-the-move' solution in the market today using the Thaicom-4 (IPSTAR) satellite. RaySat Antenna Systems is a provider of mobile, two-way, low-profile, phased-array sat-



US-based company GATR Technologies provides deployable satellite solutions, including a patented inflatable antenna.

ellite antennas for the commercial, public safety, military and transportation markets. These antennas allow moving vehicles, such as trains, military assets or corporate fleets to receive high-speed, two-way Internet connectivity over satellite.

The IPSTAR iMOVE product consists of RaySat's advanced low profile 5.9 inch array antenna that can be fitted to any vehicle such as an SUV, van, bus or train. The antenna is able to track the Thaicom-4 (IPSTAR) satellite at all times while the vehicle is moving providing true mobile broadband services. By using IPSTAR, combined with Raysat's cutting-edge mobile antenna, IPSTAR iMOVE offers the fastest mobile satellite bandwidth solution in the market today and is ideal for high performance and cost-effective mobile video, voice, and data applications and suitable for the enterprise, government, military, broadcasting, and emergency/disaster relief markets.

Both companies successfully tested the IPSTAR iMOVE in Thailand and will jointly market the product throughout the 14 countries in the Asia-Pacific Region where Thaicom-4 (IPSTAR) provides services.

Patompob Suwansiri, Head of Marketing, IPSTAR, at Shin Satellite, said, "The IPSTAR iMOVE is our latest IPSTAR product that we are very excited about as it offers a unique and innovative solution that has not been possible until now. With the powerful combination of Raysat's advanced mobile antenna product and the high performance and unique characteristics of the IPSTAR satellite, we are able to offer our customers the best performing mobile broadband satellite solution in the market today. With such high bandwidth performance, applications such as high-quality 2-way video conferencing and Satellite News Gathering (SNG) are now possible in any vehicle while it is moving. In addition, this will be valuable for disaster/emergency relief applications where communications can be maintained even while travelling to the location. We look forward to jointly marketing this product with Raysat and will offer such services throughout the Asia-Pacific region."

The IPSTAR satellite allows a very high throughput and the mo-

dem enables customers to enjoy the maximum throughput in any location and any weather condition through its adaptive architecture. The iMOVE is expected to have a big impact on the satcom-on-the-move market.

Antenna innovation – trialing the technology

Advantech Satellite Networks, in collaboration with Hakusan Corporation and JSAT Corporation, has successfully demonstrated the industry's first DVB-RCS VSAT terminal operating in a mesh topology where each VSAT terminal relays data via satellite to another terminal. This configuration effectively minimises the need for a centralised uplink site and reduces bandwidth and delay by half. A high resolution TV conferencing system was successfully and convincingly demonstrated over a mesh network of three DVB-RCS VSAT terminals. Each VSAT terminal was able to communicate with other terminals via a single hop satellite link.

The demonstration that took place in Japan, in the greater Tokyo area, was well attended by researchers and experts in the field of Multimedia Education. When asked to comment on this accomplishment, David Gelerman, CEO of Advantech, said, "We are extremely proud of this achievement as this is another world first for the DVB-RCS standard. Thanks to our successful collaboration, Advantech and our Japanese partners, Hakusan and JSAT, have developed a key technology capable of satisfying the most demanding peer-to-peer requirements. We are honoured by the trust that our partners granted us and are pleased with the prestige and knowledge that they contributed to the entire project."

Yutaka Nagai, Managing Executive Officer for JSAT Corporation commented, "We are very excited about the new SMV (Star and Mesh VSAT) system which is fully compatible with the renowned DVB-RCS standard and is capable of supporting star and mesh networks. The SMV's mesh function allows customers to establish P2P, P2MP and MP2MP links. Multipoint-to-multipoint is perfectly suited to assist relief teams in disaster situations. We are convinced that this



“ERA’s new array antenna combines low-loss waveguide radiators with low-profile, low-loss stripline beamformers to create a highly efficient and versatile technology suitable for a wide range of scenarios.”

new service will draw a fair amount of interest from customers.”

This important announcement coincides with the market release of the SatNet S5200 Mesh Terminal product and Hub Mesh option, Advantech’s unique DVB-RCS transparent mesh offering. “The transparent mesh option allows the SatNet S5200 Mesh Terminal to be part of a peer-to-peer overlay network, in which terminals communicate directly with each other through the satellite transponder,” stated Don Osborne, President of Advantech Satellite Networks. “This cuts in half both the transmission delay and the bandwidth occupied by such traffic, thus allowing for advantageous returns in both communications quality and cost. The greatest benefits are achieved for delay-sensitive real-time applications such as voice and video.

Advantech’s S5200 Mesh Terminals can communicate simultaneously with each other and with the hub. Adding the mesh option does not affect the conventional DVB-RCS functionality and the mesh functionality is a fully backwards-compatible extension of the DVB-RCS standard. The primary functions of the hub, within the mesh overlay portion of the system, are to allocate bandwidth to terminals and to control and manage them. When used in conjunction with a suitable hub, such as the Advantech SatNet Mesh-enabled DVB-RCS Hub, the S5200 Mesh Terminal supports connectivity limited only by the space segment design. The terminal interoperates with the Advantech Hub that supports single-beam configurations, multi-beam configurations with different cross-strapping constraints and even supports multi-satellite configurations. Moreover, the mesh and conventional ‘star’ operation can be on different polarisations and/or in different frequency bands.

ERA Technology has developed an innovative compact antenna for the next generation of Very Small Aperture Terminals (VSAT) for Ku-band satellite communications. The novel antenna design has recently completed a successful application trial with Hispasat, one of the biggest satellite operators in the world. The trials were undertaken in Madrid during February 2007, using the Hispasat 1D satellite. The test results were excellent, with achieved uplink and downlink data rates of over 800kbps.

Javier Vazquez, Technical Executive within ERA’s Antenna Systems business, who organized the trials explained: “We are delighted with the test results and would like to thank Hispasat for giving ERA the opportunity to show-case the flat plate array. Customers were very impressed, as they used the antenna to make satellite calls to different destinations worldwide and were quickly able to browse the Internet. The antenna fits very well with high performance applications, requiring a discrete satellite communications system, which fits into a small suitcase and is both quick and easy to deploy.”

ERA’s new array antenna combines low-loss waveguide radiators with low-profile, low-loss stripline beamformers to create a highly efficient and versatile technology suitable for a wide range of scenarios. The array is ideally suited to portable applications such as satellite terminals for broadband Internet access and man-portable military terminals where a compact lightweight antenna is a key requirement. The design can easily be modified for Ka-band applications.

US-based company GATR Technologies provides deployable

satellite solutions, including a patented inflatable antenna, advanced material research and development, and custom engineering services to military, broadcast and public safety markets. They recently won one of the 2007 PopSci Invention Awards for their inflatable antenna system that has gained a lot of attention over recent months in the military and public arena. The GATR’s system is a deployable, inflatable antenna system that provides high-bandwidth, broadcast and receive capability (large aperture dish), and low-power consumption for broadcasting and data transmission in areas where satellite trucks and large, rigid antennas cannot be deployed. The unique inflatable design allows the system to be carried into a location and set-up in less than 30 minutes. It is also checkable as luggage for easy transportation. The antenna was tested extensively through a Space Act Agreement with NASA John H. Glenn Research Centre in February 2006 before distribution commenced.

GATR’s large aperture allows the user to send and receive at lower power which nets a saving in satellite fees as well as low power consumption of equipment, valuable where electricity is supplied by battery or generator. A deployable large aperture system is also useful in areas where satellite signals are weak, and in remote locations where conventional large dish systems could not cost-effectively be deployed. Now, the inflatable antenna is used by the US military and also for disaster relief purposes and its popularity continues to grow due to its innovative design.

Moving with the times

Demand for satellite communications is growing all the time and in order to deploy these communications anywhere it is important that the design and efficiency of the antennas used to receive satellite signals moves with this demand. The new generation of antennas that is currently in development will allow for improved access to communications anywhere, whether it be on the move, in remote areas or in the sky. Constantly striving to improve the functionality of antenna systems will ensure effective advancements of satellite communications and their easy deployment. ■



Photo courtesy of Patriot Antenna Systems.