



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.

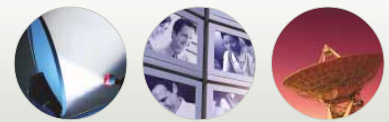
The mobile antenna

Mobile satellite antenna systems are used for countless applications across the globe and are constantly developing. Satellite Evolution asks what products are new on the market and looks at the trends in mobile antenna technology.

When looking closely at satellite antennas and the changes that have been made to them over the years, it is quite amazing to think that they have come so far. The early antennas were very large and clumsy, not to mention heavy. They were difficult to manoeuvre and therefore virtually impossible to transport. Developments in antenna technology have opened the door to a myriad of applications.

Obviously, with no antenna there is no means of receiving the satellite's signal so they are a crucial part of any satellite system. So what has happened? Well, antennas have decreased in size to a great extent. Nowadays, they range from extremely small to large earth stations. They are also lighter. The advent of the use of carbon fibre in antenna manufacture means that they can be checked in as

airline luggage and remain well within baggage weight restrictions. The antennas now often break down into small pieces and are packed into flight cases for easy and safe transportation. When it comes to the assembly of the antennas it is quick and easy to deploy, in some cases taking just minutes. Operation is also simple. A great many antenna systems today do not require specialist teams to operate them and to find the correct azimuth in order to reach the satellite – this happens at the touch of a button. These are just a few of the fundamental aspects of antenna manufacture and usage that have evolved and made the deployment of satellite-based services possible anywhere and by non-specialists. These antenna systems are invaluable to the military and other government agencies, to satellite



newsgathering, to humanitarian organisations. They are also more cost efficient, a very important factor in today's market.

I would like to look at two aspects of the word 'mobile' in this article – those systems that are literally mobile and portable and the systems that provide communications whilst in motion.

Mobility: not just communications-on-the-move

Recently, there has been a lot of talk about mobile communications and other mobile services. Being able to stay in touch at all times is becoming a true need for the world's population. People want access to the same communications they have access to at home on the move as well. There are many market sectors that require mobile communications to do their jobs effectively and this demand has given rise to Communications-On-The-Move (COTM). COTM will actually allow communications to take place whilst moving. In the past, the use of satellite antennas has had to happen whilst 'on-the-pause' so that the satellite may be aligned and static in order to receive signals from the appropriate satellite. COTM eliminates the need for the pause. It means that those contained within vehicles can still send and receive data, voice, video, fax and email even whilst moving. This application has had a huge impact in the military and for applications such as SNG. However, this is also becoming a reality for civilian consumers who wish to enjoy the benefits of entertainment – satellite TV for example – whilst on the move.

In-motion satellite television

Since 1997, when NASA and KVH began work together on the principal of the reception of TV via satellite within the Advanced Communications Technology Satellite programme, the concept has come a long way and is now being used commercially.

TracStar's SV360 Series is the latest generation of mobile satellite tracking antennas. These compact antennas are designed to receive direct broadcast satellite television signals from a vehicle while stationary or in motion. The SV360 is a feature-rich antenna. It is

compact, stylish, high-performance and designed for ease of operation and reliability. With the push of a button the SV360HD is capable of receiving the full array of HDTV channels.

TracStar is the first to develop an unbeatable combination of standard features such as:

- Single coaxial cable installation (even for multiple receivers);
- Coaxial rotary joint provides unlimited azimuth travel and never a cable wrap-unwind;
- Built-in DVB satellite receiver for positive satellite identification;
- Right out-of-the box compatibility with DirectTV®;
- Dish Network and Bell ExpressVu;
- Built-in user interface provides satellite selection options, antenna status and built-in diagnostics; and
- DirectTV® and Dish Networks HDTV compatible.

The SV360 is offered as standard or with optional equipment by the world's largest and most prestigious recreational vehicle manufacturers such as Prevost, Monaco Coach, Beaver, Safari, Holiday Rambler and Country Coach. The product is also dominant in the high-end luxury bus conversion and star coach/entertainer industry.

For a number of years, people on the move in the USA have been able to watch satellite TV from their recreational vehicles. But they had to have bulky reflector antennas fitted on top of the vehicle. ERA's new ultra-low profile antenna has now made it practical for satellite TV systems to be installed in a far wider range of vehicles than ever before.

UK- based company ERA Technology Ltd, teamed with the Winegard Company in 2003 to produce a high performance antenna system that makes it possible to watch live TV just about wherever you are, or are going. Because of its low profile, the new antenna can be fitted to a far wider range of platforms including recreational vehicles, sports utility vehicles (SUVs), people carriers, minibuses and even cars. Applications for taxis, buses, coaches and trains are



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also envisaged. It is expected that the new low profile antenna will kick-start the embryonic mobile satellite communications industry in Europe, where vehicles are typically smaller and compact antennas essential.

One immediate application was in people carriers – helping to keep children occupied on long journeys. The low profile, unobtrusive antenna is highly suitable for this type of vehicle and gives passengers the opportunity to watch live TV instead of pre-recorded programmes.

Internet access whilst you travel

French company DSD Satellite Systems deploys fully automated, self-aligning mobile satellite antenna systems for the delivery of two-way high-speed Internet services. The DSD R-Mobile system is fully compatible with many of the world's leading satellite-based Internet providers, namely; Comtech, EMS, HNS Direcway, iDirect, Nera, Tachyon, ViaSat, Gilat and Gilat-based systems such as SkyEdge and Starband for global versatility and applications.

The DSD R-Mobile System offers complete freedom of mobility. When moving and relocating, the DSD R-Mobile System can easily compensate for any change in location, orientation, and even a variation in slope allowing you to get online from almost anywhere on the globe. Using a high-speed 2-way link, the DSD R-Mobile System allows you to access the Internet from anywhere your satellite ISP covers.

Mounting easily on top of vehicles (RVs, SUVs, vans, or any other commercial vehicle) or a transportable platform, with the simple click of a button, the DSD R-Mobile System automatically deploys, locks onto the selected satellite, and interfaces with the modem to enable high-speed broadband Internet service. DSD offer four types of mobile Internet services

In February 2007, Comtech EF Data entered into a collaboration agreement with RaySat Antenna System. The agreement entails interoperability testing of Comtech EF Data's CDM-570/L Satel-

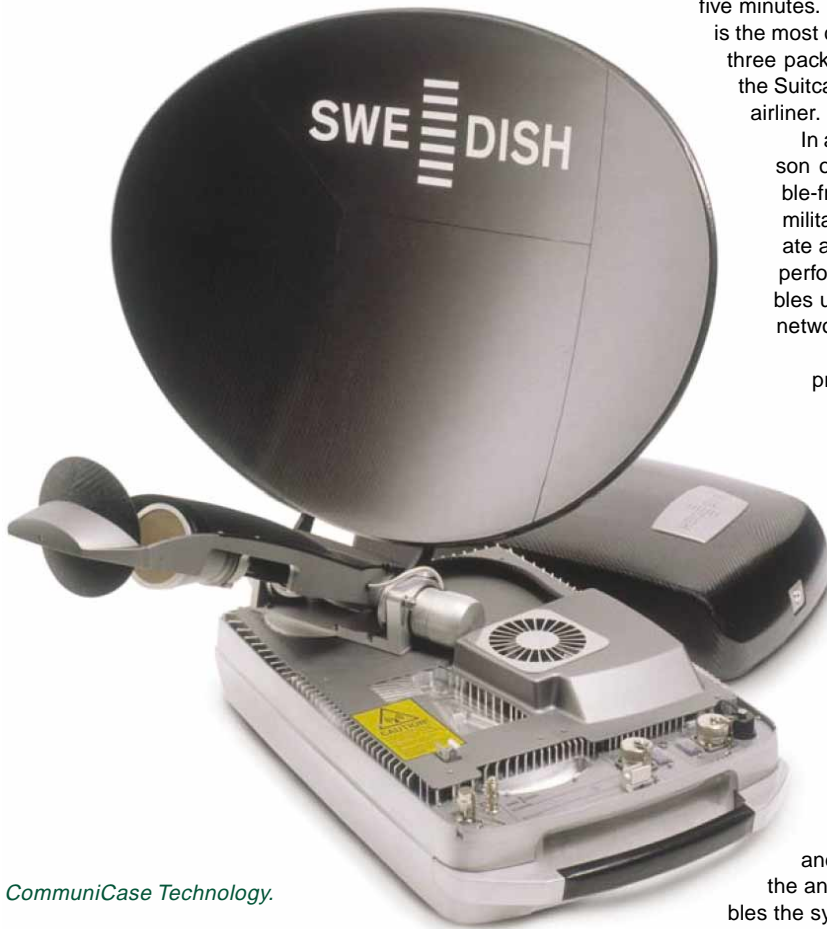
lite Modem and Vipersat Management System with RaySat Antenna Systems' StealthRay, and working together to provide mobility and communications on-the-move solutions.

RaySat Antenna Systems' core platform is the StealthRay Ku-Band antenna system. The StealthRay consists of a low profile, vehicle roof-mounted array antenna connected to a controller and a satellite modem inside the vehicle. It is a breakthrough in two-way satellite communications, and was designed to provide communications for vehicles on-the-move. The innovative antenna system automatically searches for and acquires the designated satellite signal and maintains pointing via automatic tracking and control of azimuth, elevation and polarization angles while the vehicle is in motion.

Ideal for optimising satellite communications, Comtech EF Data's CDM-570/L Satellite Modems are IP-enabled, offer superior performance and flexible interfaces, and support a variety of forward error correction and modulation schemes. The advanced features enable significant bandwidth savings, improve transmission quality and increase control of bandwidth provision. Comtech EF Data's feature-rich and cost-effective bandwidth and capacity management product, Vipersat Management System (VMS) integrates with the CDM-570/L to provide a seamless IP-based infrastructure for satellite networking. The solution is based on dynamically managed Single Carrier Per Channel (dSCPC) and automatic application switching technologies. Bandwidth on-demand is facilitated and all aspects of the satellite network can be configured, controlled and monitored by VMS.

Literally mobility

As mentioned before, the key to a mobile antenna system is in its composition. The system must be easily transported, packed away, assembled and disassembled. These highly portable satellite antenna systems are used extensively by those who require communications where none available such as the military, aid agencies and satellite newsgathering agencies. There are many systems on the market at



CommuniCase Technology.

five minutes. Because of its modular design, the Suitcase CCT90 is the most compact terminal of its kind on the market. There are three packaging options, including a configuration that makes the Suitcase CCT90 small enough to carry on to a commercial airliner.

In addition, the Suitcase CCT90 features easy, one-person operation, an intuitive graphical user interface, trouble-free antenna pointing and auto peaking, and rugged military-ready construction. Combined, these features create a terminal that sets a new industry standard for high-performance mobile communications solutions and enables users to easily and reliably communicate beyond the network edge.

"The introduction of CommuniCase Technology and products such as the Suitcase CCT90 represent major advancements in portable satellite technology," said Lars Jehrlander, CEO, SWE-DISH. "These innovations are in response to the needs of organisations that require great speed and mobility, and we will continue to work side-by-side with them to evolve technology that delivers broadband communications anywhere it is needed."

The Backpack

The trend of building an antenna system into a highly portable unit has been picked up by Patriot Antenna Systems who recently launched a 1.0 metre backpack flyaway TX/RX antenna. It is designed for worldwide transmit and receive in Ku- and Ka frequency bands and is lightweight and portable with rigidity and high performance even under wind loading conditions. The rucksack is airline checkable and weighs less than 65 pounds. Set-up is simple and the antenna comes in six pieces. A sturdy feed boom enables the system to accommodate many different BUC/LNB op-

present that ensure easy transportation and deployment - here are some examples.

The CommuniCase

SWE-DISH Satellite Systems AB, recently acquired by DataPath, demonstrated for the first time its CommuniCase Technology at IBC 2007 in Amsterdam. CommuniCase Technology (CCT) enables broadcasters, military personnel and emergency first responders to easily interchange parts, such as integrated modems, and improve flexibility. SWE-DISH is introducing the technology in a line of CCT products highlighted by the Suitcase[®] CCT90, the world's most compact and quick-to-air broadband satellite terminal, and the Drive-Away CCT120. The Suitcase CCT90 represents the next generation of ultra-portable terminals following the success of SWE-DISH's IPT Suitcase. The IPT Suitcase has earned high praise from military and government organisations throughout the world, including military operators in conflict areas and disaster relief organizations responding to Hurricane Katrina in the US and the tsunami that struck Asia in 2004.

What sets the Suitcase CCT90 apart from other products on the market is CommuniCase Technology's common modular system architecture. With its slide-in cassette, the integrated modem of the Suitcase CCT90 can easily be switched out and plugged in to another CCT product, such as the new Drive-Away CCT120, to adapt systems for rapidly evolving operational needs. In addition to improving flexibility and system reliability, the easy replacement and sharing of components creates a significant cost advantage.

Like the IPT Suitcase, the Suitcase CCT90 features an advanced, user-friendly design that makes SWE-DISH terminals the world's quickest-to-air terminals, achieving satellite acquisition in less than





tions. A motorised version of this highly portable system is expected to be on sale soon.

A similar idea is available with BGAN technology. ViaSat have developed a BGAN AN/PSC-14 Manpack Terminal with integrated type 1 encryption. This ruggedised terminal combines security and broadband with simple deployment.

Flyaway Systems

So-called 'flyaway' antenna systems are the staple of on-the-spot communications for industries all over the world. Once again, they are easy to transport, assemble and operate and are available in a wide range of sizes for different capabilities. They allow business to be conducted from remote locations by offering the same facilities that would normally be available in the office.

UK manufacturer Holkirk Communications fabricate systems for use by governments, international media organisations, the oil & gas industry, disaster recovery, medical organisations for SNG or VSAT & other Internet over satellite and data applications.

The 'Tri-Sat' range of antenna systems are renowned due to their compact size, light weight and powerful performance having been designed to excel in today's ever demanding satellite communications industry.

The user friendly modular design allows for simple, fast and accurate satellite acquisition either as a manually controlled mount or as a fully auto-acquisition motorised mount controlled either locally via a touch screen or remotely via an ethernet port. The light weight and sturdy tri-pod design houses a truly versatile HPA cradle which can accommodate a wide range of third party HPA's up to 400W in X, C, Ku and Ka-Bands, neatly doing away with the long lengths of fragile flexible waveguide normally associated with flyaway systems. The design of the tri-pod mount also means that other 3rd party antennas can be fitted allowing existing equipment to be cost effectively upgraded.

The main reflector is manufactured from high quality carbon fibre and is supplied in six easily assembled petals that employ a revolutionary spherical dowel locking mechanism.

The revolutionary design of the complete fly-away system allows for the 'Tri-Sat' to be transported in two easily manageable carry

cases under 32kg that can be checked onto any commercial aircraft making the 'Tri-Sat' a totally flexible fly-away system.

Whilst the antenna and transmitter assembly must be exposed to the elements, the auto-acquisition controller and the test and monitoring baseband package can be located remotely as the option includes 5m & 25m cables with longer lengths available.

Tri-Sat is available as a manually controlled mount or can be upgraded with Holkirk's auto-acquisition controller. The transmission unit can be configured to incorporate up to 2 L-band MPEG 2 encoders, an L band modem, voice and data (up to 8 channels), with an option for an MPEG 4 encoder.

London-based company Link Communications' LinkMobile Satellite Internet System allows users to access the Internet at broadband speeds from virtually anywhere that a vehicle is parked. It mounts easily on top of the vehicle or transportable platform and locks onto a selected satellite automatically at the click of a button. It also interfaces with the modem to enable service. The LinkMobile system provides coverage throughout the Americas, Caribbean, Europe, Middle East, Africa and Australia as long as there is a clear line of sight of the desired satellite. It is a rapid, robust, reliable and adaptable system.

The luxury of choice

There is a huge range of mobile antennas available today that fulfil a wide range of applications and the industry continues to develop more. The next big thing in the mobile antenna sector is expected to be Smart Antennas that merge an antenna array with a digital signal processing capability to enhance range, speed and capacity. Smart antennas are already being used for military applications but now they are expected to move into the commercial arena as they satisfy the demand for the higher data rates necessary for mobile applications such as mobile direct broadcast satellite systems. Other suitable applications include the provision of location information in emergency situations.

As we cover more and more of the globe, the need to communicate in a range of different ways wherever we are, no matter what we are doing, is becoming the norm. Mobility is definitely the keyword in the evolution of antennas. ●

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