

## What's in a name?

For 60 years Jaybeam's name has been associated with each evolution of antenna technology, from TV and radio into today's leading mobile and PMR networks. With \$50m of worldwide antenna sales, Jaybeam has extended its reputation from bespoke military and PMR applications to the world's largest networks and operators. In 2009, Jaybeam stepped up to the global stage; more than doubling its worldwide antenna sales by joining the Amphenol group, a company with an equally long history and a name that many will associate with the first choice for connectors used throughout the industry. Today Amphenol is a \$3.5bn global leader with 90 plants around the world including 22 in China alone. Amphenol Jaybeam's antenna business extends through factories in the UK, France, USA, Mexico, Brazil and India. In 2010, remaining within its Northampton roots, Jaybeam will see a doubling of its PMR manufacturing capacity to become the European centre of PMR development and production. With an expanded team will come the addition of an entire range of antenna line products including cables and connectors from Amphenol's global network. A successful UK manufacturing story, Jaybeam looks ahead positively to its next 60 years.

## Connecting with "Amphenol OneSource"

To streamline the purchasing needs of our customers, Amphenol Jaybeam conducted a study on some of our leading partners in markets such as system developers, installers, and integrators. As a result, Amphenol Jaybeam developed a solution called **Amphenol OneSource** – a complete RF system that integrates antenna, cable and connector technologies.

**Amphenol OneSource** is designed to simplify procurement for base station antennas site deployment. Where two or more vendors are normally needed to source products, Amphenol Jaybeam will supply a one-stop-shop solution for antennas, cables, and connectors. This solution will allow for seamless deployments and greatly minimize delays or rescheduling of site installations.

"We felt that there was a gap in the market to provide either a kitting solution or supply individual components direct from the manufacturer that can help re-address this balance," stated Alan Spencer. **Amphenol OneSource** has all the benefits to provide quality leading products plus the convenience of using a single source. Let us help you connect your antenna needs with **Amphenol OneSource** – launching in Summer 2010.

Globally renowned for its antenna, interconnect, and cable products, Amphenol is a leading solutions provider to the wireless infrastructure market including applications such as PMR / TETRA networks and cellular base stations.



*"At the BAPCO trade show in April 2010, many attendees remarked to me that 'We have always preferred Jaybeam'..."*



Alan Spencer  
PMR Sales Manager

### BACKGROUND

No stranger to antennas my career started in 1987 when I joined UK PMR antenna company APL, in my home town of Aylesbury Bucks, as a solder assembler.

Gradually I worked up to hold the position of production controller and went back to school to study manufacturing engineering. APL was bought by Sigma Wireless and it was here that I took the step in to sales covering the south of England as a sales executive. In 1997 joined USA company Centurion (now Laird) as European Account Manager selling custom designed antennas to consumer OEM companies like Motorola, Nokia and Ericsson. Over the last few years headed European Sales for Sarantel (a GPS antenna company) and Embedded Antenna Design (surface mount antennas).

Fast forward to March 2010 when the chance to join Amphenol Jaybeam was given to me - how could I refuse!

### GROWTH AND OPPORTUNITY

With just 3 months in to this role it is apparent what a strong reputation over many decades that Jaybeam has for quality, performance and reliability. At the BAPCO trade show in April 2010 many attendees remarked to me that "We have always preferred Jaybeam". What an endorsement to have from industry veterans! Recently whilst visiting a customer running a PMR network they shared with me photos of a 4 stack dipole that was still in place 15 years later.

One point I would like to address, Amphenol Jaybeam is as serious now with PMR / TETRA products as it always has been. These products are the heart and soul of this company and we will remain the dominant designer and UK manufacture of this antenna technology on a global basis.

In the near future - I will be responsible for the introduction of other complimentary Amphenol products - cables and connectors. The idea is the radio equipment will have "Amphenol OneSource" which will provide connectors, cables and antennas to our customers with a single source.

In time I hope to have the opportunity to talk or meet with you all very soon.

Regards,  
Alan Spencer  
+44 (0)7718 525 603  
alan.spencer@jaybeamwireless.com



## Aonach Mor

Amphenol Jaybeam was approached to supply an antenna that could withstand the extremes of the Scottish Highlands, a region where the conditions could be some of the most arduous possible. The technical requirements to consider were the wind speed at 80 m/s and the ice loading. It was a situation where the specifications needed to be understood to ensure the development of an antenna that meets the customer's unique requirements.

Ice loading narrowed down the antenna choice from a folded dipole to a shrouded collinear and the application specification of 50mm of radial ice along with the extremes of wind loading needed to be considered. Thus the new 7502150 was born.

With a frequency of 145 – 175 MHz, this single dipole antenna allows mountain search and rescue teams to perform their duties in all conditions, often being required during the most inclement conditions as a matter of normal operation. The addition of lightning protection into the design requirement was added to ensure the survival of the antenna during electrical storms (up to a limit of 2.5 x 10<sup>6</sup> Amp<sup>2</sup>/sec).

More than 95% of the antenna components had undergone vigorous testing in the development of an Airwave 3m long collinear antenna; therefore, the 2m model will be naturally stronger. The only remaining weakness is the wooden hut the site used as a base.

## Concealed Antennas – When a Pole is Not a Pole

The development of antennas continues, with each year a new focus changing the product roadmap. New associations create new drivers and constraints which require further development to reach an ideal solution for the operator or installer.

In the past, development could be restricted to bandwidth increase, beam accuracy or beam width, but with increasing customer awareness of the product and technology planner have created a new demand – that of regulatory visual impact. In some cities no installations have taken place for 24 months, while subscriber numbers and traffic continue to grow unchecked.

A solution is needed to replace the proven performance of the head frame tower. This solution needs to enable installers to easily acquire sites, deploy the design and complete the installation in the shortest time possible, given the necessity to plan for road closures and other logistical constraints a reliable solution is the foremost requirement.

The normal path for development has occurred in this product range with 'simple' arrays be followed by more complex arrays. Thus a 900 MHz solution was developed some years ago, with remote variable electrical tilt to enable the optimisation of the site without the necessity to climb the structure. The three sectors fixed on bearings of 120 deg align to the networks plan.

Following this success a high gain array was developed based on the panel array to produce a tri-sector with 230mm diameter and RET capability.



The market next demanded a dual frequency product to allow a 900/1800 operator a complete solution for a cell within one antenna structure. After years of design trials and environmental testing we issued the 5270500, a structure which holds 3 sectors of dual band arrays on 120 deg bearings each with independent variable tilt. The key feature is the small diameter of 325mm which enables the structure to be installed at street level without a large support structure. RET development has enabled the system to be used with the leading suppliers of BTS where the AISG protocol is employed, but also for use with the Ericsson protocol and Node B's.

The additional requirement of adjustable Azimuth requires a larger diameter to be used as the array physically moves to point the bore sight of the antenna to the new pointing bearing +15 deg or -15 deg.

Just when we thought the job was done – another requirement appeared. Planning is more relaxed on flag poles...could the antenna carry a flag?

This required a complete redesign of the load bearing structure as the top of the antenna carries the entire load in this case. For the flag size to be proportional to the antenna diameter a flag of 3 x 4.5m was needed.

The design required a method of proving the design mechanically, pulling the top of the antenna with 2000Kg! A few broken antennas and FEA later the transfer of the force from the top, to the base of the structure was concluded, and the 52704XX antennas produced, with the same electrical performance as the 5270XXX.

Our ability to produce solutions to meet customer requirements has left us leaders in the product line of multi-band tri-sectors and concealed solutions in the