

# Defence Insight

Issue 1: ABC backshells | Welwyn switch fuses/microdisconnect case study | SC21 | Company profile – ABC | Outlook/Comment

**Welcome to the first issue of TT electronics Defence and Aerospace Review, which will be a newsletter to let you know what is going on across the Group in this important segment.**

We aim to increase communication highlighting new contract wins, product developments and exhibitions together with news from the market segment.

### Why Defence & Aerospace

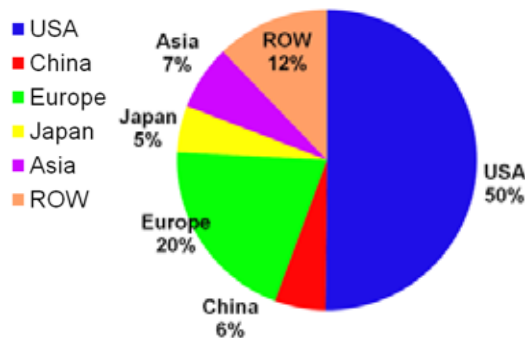
In December 2008 TT electronics announced its strategic direction to the City and cited that the business would focus on developing Defence and Aerospace as a market segment. So where are we up to?

In 2007, Defence and Aerospace accounted for 9% of the total sales of TT electronics. Through the 3 year planning processes this market segment is expected to grow by 20% per year to account for 17% of TT sales by 2012. This is clearly a sector where TT can provide innovative solutions to the ever increasing demands for technological solutions on the battlefield and in the skies.



### So how big is the defence sector?

In 2009 it is forecast that global military spending will exceed \$900bn, of which the USA accounts for over 50% of this spend at \$450bn. Of this spend nearly 40% goes into equipment such as planes, military vehicles, communications, missiles, radar systems and ships. All of this equipment requires technologies which we develop.



This market sector is forecast to continue growing and technological developments are expected to accelerate as technology plays a greater part in the battlefield and aerospace. Many TT businesses supply this sector with products and we are looking to focus on how we can build on an already broad customer base with our breadth of technology.

### So what has been going on in H1 2009

Virtual Military Teams established. This has provided a forum for the sales teams in Europe and the USA to share information about programs and customers. We are bringing the companies under a TT electronics defence branding and conducting a number of roadshows at customers such as Selex, Thales, Dyteca and Smiths Detection. Shared information has led to success with Smiths Detection where orders of over £1.75M have already been secured. This activity will continue in H2 and the number of roadshows expanded.



**Harvey Preston,**  
Divisional Director,  
TT electronics –  
connector division



## Exhibitions

TT electronics is preparing for the 2 major defence exhibitions at DSEi and AUSA in the autumn, having already exhibited successfully at DVD and UAVSI.

A strong contingent representing three TT electronics divisions attended this year's AUVSI Unmanned Systems North America Conference and Exposition held in Washington DC from August 11-13, 2009. Personnel from TT electronics integrated manufacturing services, AB Interconnect, New Chapel Electronics Limited engaged in high-level discussions with defence and aerospace businesses representing over 400 companies from 32 nations.

As the world's largest unmanned systems manufacturing event, AUVSI Unmanned Systems North America 2009 showcases some of the aerospace and defence industry's newest advances in technology, materials, components, electronics, machinery, systems and services.



**Visitors to stand # 894 will have the opportunity to win a military activities experience. The lucky winner will have the opportunity to drive a range of military vehicles and shoot classic weapons, the best driver of the day also gets to crush a car with a Chieftain tank.**

## On display at DSEi:

**AB Connectors is delighted to offer its own manufactured fully approved range of 38999 Series III connectors**



AB Connectors has secured the prestigious Qualified Products Lists (QPL) qualification from the Defense Supply Centre Columbus (DSCC) for its new range of D 38999 series III connectors. These connectors are widely used in the highly demanding military, avionics, aerospace and naval markets. The qualification, gained after rigorous formal testing in the USA approved test facilities underlines the commitment by AB Connectors to supply high quality performance products for all military and commercial markets and completes a very comprehensive product portfolio. The current product is produced in both Zinc Cobalt and Cadmium (in-house plating factory). In the near future Class Z (Zinc Nickel) will also be available. The demand for high performance connectors that cope with the excesses of innovative design whether this is to meet significant G forces, high speed data transmissions or indeed challenging environmental situations will be met by this new range of connectors.

### 38999 Series III backshells

AB Connectors has also launched a new Back-shell catalogue which includes a comprehensive range for their newly approved 38999 series of connectors.

The catalogue also features back shells for the Mil 5015 and Mil 26482 style of connectors. This catalogue has 100 pages of specialist backshells manufactured by AB connectors and its sister company New Chapel Electronics.

## Case study: Welwyn Components – Software controlled fuses.

Many electrical systems are controlled electronically using semiconductors to switch power on and off. In some safety critical applications there are potential faults inherent in the nature of the semiconductors, which can be difficult to guard against and make safe. They can fail short circuit, allowing the current they are controlling to continue to flow. Conventional fuses are unable to protect systems against this fault as the current flowing may be at normal levels.

In complex power electronics systems, such as those used in aerospace applications, sophisticated software controls allow many real time checks on the health of the system. Faults such as short circuit semiconductors can easily be detected. What is needed now is a safe and reliable way to disconnect the power running through the faulty semiconductor.

TT electronics Welwyn Components has introduced a switch disconnect component with a very low resistance fuse link path for the current to flow through in normal operation. When a fault condition is detected the fuse can be activated by an independent control signal, opening the fuse in a controlled manner.

This feature allows for the software of the system to decide when to activate the fuse, in response to any fault conditions, irrespective of the actual current running through the fuse. In gross current overload this will break as a conventional fuse. For use in civil and military aircraft applications the device is light and robust. Voltage withstand of the open fuse at high altitude is maintained by a semi hermetic construction.

### Applications – Wing de-icer for Boeing 787 Dreamliner



The new de-icer system for Boeing's 787 Dreamliner incorporates heater panels moulded into the leading edges of the flight surfaces. These are powered electrically when needed to prevent ice formation.

The control system switches power to the heater panels through 44 channels of MOSFET switches. If a fault causes a MOSFET to remain switched on then the heater panel can be damaged, leading to an expensive refit working on the surface of the wing.

To overcome this potential problem each power channel is protected by a Welwyn Switch Disconnect component and the system is scanned continuously by the control software. If a short circuit fault is detected a signal is generated which activates the Switch Disconnect and opens the fuse element, isolating and protecting the heater panel. The control system has several degrees of redundancy built in so that the heaters will continue to operate with one channel isolated. Using this system any subsequent repairs required are only to the electronics and not to the airframe.



Above: Software controlled fuse

## Military Contracts Awarded

### M-ATV – USA

Contract awarded to Oshkosh for 4,000 vehicles for delivery by March 2010.



### Eurofighter Traunch III

Recent contract signed for 112 aircraft. Value per aircraft to TT electronics £100k.



### VIS-X Cobham

Secured a \$2bn contract to provide radio upgrades to the US military.



### Oshkosh Defense

Won a contract from the US Army for the medium tactical vehicles (FMTV). The FMTV rebuy programme is a five-year, indefinite delivery / indefinite quantity (IDIQ) contract award for the production of up to 23,000 vehicles and trailers and support and engineering services.

## **TT electronics Integrated Manufacturing Services – The Journey to SC21 Recognition**

Choosing the self-starter route, TT electronics integrated manufacturing services sought SC21 recognition to strengthen its position as a supplier to major UK aerospace and defence businesses. TT customers Ultra Electronics Sonar and Communications Systems and Cobham Defence Communications – both SC21 founder members – agreed to act as sponsors. With their support, TT achieved SC21 Bronze recognition within a very short space of time.

The decision for the Rogerstone site to join the SC21 programme was taken partly for strategic reasons, to offer recognised services to the aerospace and defence sector, but also as a natural extension to the internal quality initiatives that had been in operation for around a decade. For TT electronics, SC21 presented a logical step forward, building on the internal quality and continuous-improvement programmes that began in 1999 with implementation of the company's first QOS. As a way of moving forward and extending this commitment to quality, SC21 successfully externalises quality management and the pursuit of continuous improvement by recognising the need for effective co-operation between suppliers and their customers.

Ronnie Hunt, who is Business Improvement and Quality Manager at Cobham Defence Communications in Blackburn, a sponsoring partner of TT electronics, adds that SC21 provides an effective foundation for lean manufacturing. He explains that, "lean practices such as reducing batch sizes and increasing the frequency of call-off deliveries can only be implemented if there is complete confidence in the quality of the supply chain. This requires both companies to increase their understanding of each others' businesses and share best practice improvements."

To read the full-length article, please visit [www.ttelectronics-ims.com](http://www.ttelectronics-ims.com) or read the July/August 2009 edition of Electronics Assembly.

## **AB Connectors profile**

The Connectors Division of TT electronics plc comprises of AB Connectors based in Wales, along with manufacturing and design facilities in North Carolina, USA, in Suzhou, China and an aerospace harnessing company in England.

The Vision for the Connector Division is that within the next decade it will provide interconnect product to every plane and train. To be connected on the battlefield, in vehicle, on soldier, in communication and in power for our defence forces, and to offer design and manufacture from our facilities in Europe, USA and Asia

AB Connectors was founded in 1935 in London as AB Metal Products and moved to Wales after WWII. In 1976 the business diversified from manufacturing metal components for domestic appliances into military electronic components before being renamed as AB Connectors Ltd. In 1993 TT electronics acquired the AB Electronics Group PLC and with it AB Connectors.

Today, AB Connectors continues to operate from its manufacturing facility in Abercynon in Wales, UK and is recognized as one of the market leaders in design, test and manufacture of harsh environment interconnection systems, bespoke harness assemblies and connectors.

Through a commitment to a structured new product introduction process, AB Connectors is continuing to invest in research and development of new materials and processes, surface treatments and very latest manufacturing technology and techniques to ensure the products meet the most exacting standards encountered in the military, transportation and aerospace market places. Quality systems and approvals include ISO9001, ISO14401 along with various product and market sector approvals including the military Mil-std 790 and mass transit IRIS certifications. As a result of these qualifications AB Connectors have been awarded several major customer approvals and accreditations.

**"The Vision for the Connector Division is that within the next decade it will provide interconnect product to every plane and train."**

---

## Growth opportunities in the defence sector *by Harvey Preston*

### Going into DSEi, there is absolutely no doubt that electronic technology continues to be at the forefront of the evolution of defence capabilities.

Despite the current global downturn, and the consequent restraint in government expenditure, there are a number of areas that are seeing urgent allocation of resources, especially in the context of current conflicts.

One of the most important is for countermeasures against the threat of Improvised Explosive Devices (IEDs) in Afghanistan and Iraq. Whilst strengthening the armour on the vehicles is an obvious and essential precaution, there is no doubt that electronic systems, designed to prevent the devices being detonated, can make at least as great a contribution to safety without adding excessively to the weight of the vehicle. There are two major electronics countermeasures being explored. The first is communications jamming, to disrupt wireless detonation mechanisms. The second is in the area of detection, identifying where the devices are buried and bringing the target vehicle to a timely halt.

Longer term, military communications systems are likely to be one of the biggest areas of investment over the next 5-10 years. The upgrade, which has already started, will create a fully digital Net-Centric communications system. Voice, data and video information can flow securely and rapidly throughout all theatre elements in the battlefield. The term 'theatre element' can mean anything from the command centre to an individual infantryman on the frontline. Indeed, one of the many interesting ideas being explored is the introduction of electrical harness systems for individual combat soldiers, providing each of them with personal communications direct to the command centre

and other units plus location information for themselves, their enemies and their allies. Such systems are capable of being extended to provide a vast amount of further information, such as information on chemical and biological weapons being deployed.

Naturally, one of the challenges with these systems is power. Whilst currently standard lead acid and AA batteries are in common use, battery life continues to be an issue in an environment where lives depend on continuous operation and replacement batteries or recharging facilities are at a premium. Improvements in battery technology are being developed, with Lithium chemistries showing particular promise. Whilst in some battle zones, solar power offers great potential all developers of defence electronics systems are being challenged to make their equipment as power efficient as possible.

Finally, the rapid development of Unmanned Aerial Vehicles (UAVs) continues. Increasing a UAV's capabilities entails adding further and more sophisticated equipment whilst keeping them light, small and manoeuvrable. The semiconductor industry's ability to integrate ever more functionality onto ever smaller chips due to Moore's Law is a great benefit in this context, but again, one of the challenges is to power the system.

These are just four of many areas where I am anticipating announcements and developments at the upcoming DSEi. Apart from anything else, electronics systems can make a great contribution to the safety of troops in theatre, helping to reduce the tragic casualties of which we have seen too many in recent weeks.

**"...military communications systems are likely to be one of the biggest areas of investment over the next 5-10 years."**

---

## About TT electronics

TT electronics plc is a focused, global electronics company supplying the world's leading manufacturers in the avionics, defence, automotive and industrial electronics markets. The Group operates in five key sectors: electronic components, sensors, electronic manufacturing services, secure power and industrial.

TT electronics operates from headquarters based in Weybridge, Surrey. From this base the Group controls operations across the world in both developed and developing economies.

Additional information is available from our corporate website: <http://www.ttelectronics.com>

It would be great to get your feedback on this Insight or any other topic that's on your mind. Comments, view and questions can be e-mailed to me [harvey.preston@ttabconnectors.com](mailto:harvey.preston@ttabconnectors.com) or you can call me on +44 (0)1443 743401.

Or you can contact [liz.blair@ttelectronics.com](mailto:liz.blair@ttelectronics.com) +44 (0)1670 536 749.