An engineer, versed in the politics of business, Professor John Roulston (a self-defined ‘dabbling radar engineer’ whose Blue Vixen in the Sea Harrier ‘achieved world accolades’) is probably less known for his commercial acumen. But it was visible in his role leading the international Euroradar consortium, and with his concept of the ‘single equivalent company.’ It is his business acumen and engineering expertise that has already impacted on Filtronic’s development and will be responsible for moving it forwards in future.

Radar-like acumen

“Radar is critical technology that needs generation of high power. But the US International Trade on Armaments Regulations aims to prevent countries buying GaAs power devices such as amplifiers, having them as ‘controlled’ items,” says Roulston, explaining the strategic link between BAE Systems and Filtronics plc, which came when BAE Systems paid a reputed £10m license fee to enable power device access from Filtronics, for radar GaAlAs PHEMT.

“To make premium power devices, Filtronics uses in-house epitaxy and stepper technology in the fashion of the silicon DRAM industry originally located at the Newton Aycliffe plant. The PHEMT process is developed for MMICS, low noise and power use. Device yield is aided by the extreme quality of plant chemistry and construction, derived from its DRAM past. The high level of automation makes the processes cost effective.”

Queried about the impact of Caswell’s closing its GaAs line, Roulston reflects that ‘any reduction in the UK share of technology is sad.’ But he pragmatically notes that there is overcapacity in Europe and the move is insignificant to Filtronics. “Newton Aycliffe has capacity for 30,000 wpa 6″ equivalent and the capacity to very easily upgrade the facility to 100,000wpa.”

The other benefit to BAE Systems from using the Filtronics foundry was the ability of the central technical group to do the designs, competent to foundry rules, and have a startling turnaround time. The foundry loop to a refinement was seven weeks compared to 20 or 30 weeks on “designs that sometimes need two to three passes to be perfect. It enables BAE Systems to implement integrated design with large cost benefits.”

Roulston explains the new BAE Systems solid-state SEASPRAY radar uses GaAs processing electronics to form and move the radar beam without mechanical interaction or delay. “Smart antennas in the communication field are moving this way too. The active array here concentrates the base station energy in the cell part that needs it most, as in improving data rate for a specific subscriber.” However, while the communications array may use a small number of active elements, radar arrays, even airborne, need thousands. Both applications share common GaAs technical and systems principles however.

The communications industry leads military in cost terms, but military pioneers sophisticated systems like active antennas. Roulston sees the opportunity in adding systems knowledge to a strong technology and production house like Filtronics. “2000,000 new mobile base-stations are installed every year in the world at costs that mean emerging countries will never buy copper. The ‘radio rules’ theory is a matter of fact and the threat from fibre looks further away than ever.”

For those who wonder if Edinburgh’s industrial professor of electronics has enough commercial savvy to lead Filtronic in a cut throat industry, there must be solace in his ambition to harness the component technology the company has already invested in, to form high-value systems.