SiliconSouthWest
Promoting the UK's South West electronics sector
Issue 7 December 2006

Cadence looks to SouthWest for entry into the startup market

Design tool vendor Cadence Design Systems has set up its own startup programme to work with small companies and management buyouts, starting with Air Semiconductor in Swindon.

This echoes the Cre8Ventures move last year by Mentor Graphics and puts the two EDA vendors head to head. However, it differs from the Cre8Ventures by being led by venture capital funds.

"There are a lot of startups across Europe and the numbers are increasing," said Sean Redmond, vice president of Europe for Cadence. "This really came from discussion with the VCs. When they got through their due diligence and released the funds then the design team started the process of deciding what design tools and design flow to use and that was taking the investment way form the real focus of getting the real products as quickly as possible and getting some real return."

Through its Virtual CAD team, Cadence is working with Pond Ventures and Atlas Ventures to supply startups with its tools at commercial rates and is looking at other VC funds in France and Germany. It is already working with Air Semiconductor in Swindon and Altair Semiconductor in Israel, as well as 8 other startups in the last quarter.
The Mentor approach includes tools but also looks at finding management and customers through a network of executives.

"The [Cre8Ventures] program takes a hands-on approach to the route-to-funding and all important route-to-market challenges for the start-up," said Carson Bardbury, director of Mentor's Cre8Ventures. "It strongly supports the incubator idea and is currently active in six incubators across Europe; three within the UK: at SETsquared, the ISLI [in Edinburgh] and a custom Cre8Ventures incubator environment in our own dedicated building in Fleet. "

"We are now actively helping 50 start-ups in 21 different markets, four taking on design challenges at 90nm or below," said Bradbury. "But because we can surrounded them with serial entrepreneurs, who have achieved multiple exits with their own fabless stocks, I am certain these great new entrepreneurs will have an awesome opportunity to succeed."
www.cre8ventures.com
www.cadence.com
www.mentor.com

Reported in this issue:

Top Secret

Air Semiconductor is still in 'stealth' mode and not revealing it's plans, except that it is aiming at the mobile phone market.
www.air-semi.com

University of Bristol wins top prize in battle for best business idea

The universities in Bristol, Bath and the West of England took part in a three-way contest to decide the Winner of Winners 2006 for a £10,000 prize for the best business idea. All three universities run individual business ideas competitions among students, alumni and staff, and six ideas competed for the top title.

The prize went to the University of Bristol entrant, SensaGest, which has developed a nurse call system that can be operated by people with minimal hand movement. The device will be connected to a small wearable computer which will be programmable to enable easier communication and control over other devices situated near the beside.

Ian Anderson, postgraduate in the University's Department of Computer Science and Managing Director of the winning SensaGest Ltd team said, "We are delighted with the prize which will enable us to accelerate the progress of our idea. Clinical trials will start in December at the Midland Centre for Spinal Cord Injuries prior to the launch of the hospital and home products in March."
www.bristol.ac.uk

Vice Chancellor Eric Thomas of University of Bristol, page 10

Opinion

Bring it on!

Being fought over can make you feel valued, but only as long as it adds value to your business. That is the case with Mentor Graphics and Cadence Designs Systems, who are both falling over themselves to help startups in the region. Both see high tech silicon startups as the path to future growth, and want to help accelerate that growth as much as they can. This can only be good news for entrepreneurs, who should take advantage of the opportunity to get the best deal they can. This is not necessarily on the tools themselves, although that helps, but on the technical and business support and even on the design support from these companies.

This applies to companies across the region. Mentor's Cre8Ventures was instrumental in bringing together companies in Devon and Cornwall recently, who hopefully will also benefit from the expansion of the SiliconSouthWest activities in that area. Linking up companies from across the region with skills, funding and business expertise will continue to grow the largest chip design cluster in Europe, something we can all be rightly proud of.

Nick Flaherty, Editor

SiliconSouthWest

Editor: **Nick Flaherty**
editor@siliconsouthwest.com
Tel: +44 (0) 117 942 6344

Contributers: **Nadya Anscombe** & **David Manners**

Design: **www.lunatrix.co.uk**

Published by: Carpenter House Innovation Centre
First Floor, Broad Quay, Bath , BA1 1UD

Contact: **Simon Bond**
Director of Innovation Centres
University of Bath, Tel: +44 (0) 1225 388 682

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For comment, analysis and the latest videos on what is happening across the electronics industry go to the new blog by SiliconSouthWest editor Nick Flaherty at www.flaherty.co.uk

Lack of City funding lets down technology

Financiers don't have a clue about the importance of funding science and technology ventures, according to a major report by the Engineering and Technology Board (ETB).

The report – SET and the City – looks at the "paradox of why are there so few science, engineering and technology (Set) businesses generating wealth in the UK, when London is a powerful capital market and our science base is among the best in the world?"

While some of these new ventures such as picoChip and Icera are in the South West with backing from venture capital funds, the report points out that for the current level of public investment in science and engineering to be proved to be economically worthwhile and sustainable, the private sector had to match Government's commitment financially, especially in early stage technology based companies emerging from the science base.

"There was little sign if any at present that this message was accepted or understood [when talking to the City]," says the report. "This could have dangerous consequences for UK technology based industry in the longer term."

To grow emerging companies into world class, world scale enterprises, the active support of the capital markets was regarded as essential, says the report. "All the evidence calls into question the commitment of major financial institutions to technology stocks per se as an asset class distinct from other investments.

The consequences of this are dire. "In the absence of a concerted response to these and the other matters, it would seem inevitable that the UK will develop a dependency culture, becoming entirely reliant on overseas innovation and technology," said the report.

The signs are not good. An experienced entrepreneur also highlighted the problem at the recent Semiconductor Devon and Cornwall meeting (see page 6)

"The VCs don't get it - even the ones that like technology don't get it," said Rick Clucas, formerly chief executive of Ignios in Abingdon that provided technology to make it easier to develop and debug chips with multiple cores. He is a former chief technology officer of investment bank Beeson Gregory and of processor startup ARC International. "Technology is just a piece in the puzzle, it's not THE puzzle. You have to be commercial or you will never succeed. The city doesn't understand technology and why should they?" www.etechb.co.uk

"Why are there so few science, engineering and technology (Set) businesses generating wealth in the UK, when London is a powerful capital market"

Bristol Airport eyes the Far East

Bristol International Airport is targeting Emirates as the airline to provide a link to the Far East.

Following the success of the New York route, which is set to extend to Washington and Chicago, the airport is now looking to expand to the middle East and from there link to Japan and China, says Tony Hallwood, marketing director at the airport.

The airport currently handles 5m passengers and is planning to expand to 9m over the next ten years. www.bristolairport.co.uk

Interview, page 11

Qualcomm drives into consumer market

US fabless chip maker Qualcomm is branching out into other markets through a new system-on-chip device and buying companies that focus on Bluetooth and wireless LAN.

This puts the company in direct competition with Broadcom and ST Microelectronics, who both design chips in the South West region.

Qualcomm has just bought Airgo, a supplier of wireless LAN technology that uses multiple antennas for the 802.11n standard, and the Bluetooth operation of RF Micro (formerly Silicon Wave). These technolgies will be used with both Qualcomm's CDMA chipsets for mobile phones but also for the new consumer part, Snapdragon.

This is aimed at adding connectivity to consumer devices, so will include UMTS 3G, broadcast TV reception, WiFI wireless LAN and Bluetooth. It is based around a 1GHz customised ARM- core designed by Qualcomm called Scorpion, paired with a 128 bit single-instruction, multiple-data capability and a 600 MHz digital signal processor to accelerate multimedia applications.

"Qualcomm is driving a shift that is taking place in portable electronics by adding ubiquitous connectivity with zero compromise for the user experience to an extended range of devices," said Sanjay Jha, president of Qualcomm CDMA Technologies. "The Snapdragon platform represents the next stage of mobility, opening the door to new opportunities."

The company has teamed up with Samsung, one of biggest customers, as the first user of Snapdragon. "Samsung has a long history of designing industry-leading devices that feature some of Qualcomm's most innovative technologies," said Jongkyun Shin, senior vice president of the mobile R&D team of Samsung Electronics. "We are very excited at the prospect of raising the bar for mobility and breaking ground on new markets that do not exist today by leveraging the capabilities offered by Snapdragon."

Snapdragon-based chipsets are scheduled to begin sampling in the third quarter of 2007.

www.qualcomm.com

"Qualcomm is driving a shift that is taking place in portable electronics by adding ubiquitous connectivity with zero compromise for the user experience to an extended range of devices"

Knowledge Network is route to funding with new CEO

The new £3m Electronics Knowledge Transfer Network (eKTN) is set to be the key way of getting funding from the DTI's Technology Programme.

"KTNs are there to help companies work together to access this kind of funding and I would urge everyone to register and engage with it because if you don't engage you can't access this type of product so the KTN is quite an important area," said Charlie Lane, sector advisor for the SouthWest Regional Development Agency at the recent Semiconductor Devon & Cornwall meeting. "The KTN is the influencer rather than the gatekeeper."

"The Electronics KTN will be the primary vehicle for connecting the electronics community, stimulating collaboration, as well as engaging our academic institutions to profile the commercial benefits of their discoveries," said David Kynaston, chairman of the EKTN.

The employers organisation, the CBI, recently urged the government to turn the Technology Programme into a UK version of the US Advanced Research Projects Agency (ARPA) with more investment to stimulate technological innovation.

Ashley Evans, the chief executive of Electronics Scotland and chairman of the UK Electronics Alliance that developed the bid for the eKTN, has this week been appointed as the KTN's chief executive. "This is a fantastic opportunity for the sector to take centre stage and really demonstrate how electronics is the enabling technology," he said. "This network will be the platform where companies will be able to learn, collaborate, find new market opportunities and collaborative partners. Our doors open officially on February 1st; in the meantime we'll be working to appoint our advisory team and set up our infrastructure"

"This network will be the platform where companies will be able to learn, collaborate, find new market opportunities and collaborative partners. Our doors open officially on February 1st"

Semiconductor Devon & Cornwall, page 6

Security boom for Isle of Wight

Nick Flaherty talks to a group of engineers leading the way in high performance signal processing in an unexpected location

In the heart of the Isle of Wight there is a group of engineers working on the very latest signal processing architectures.

Since their press conference actually on the day of 9/11, life has changed for RF Engines. Security has become a major part of the business, and the company has moved its consultancy business into a full blown product company, selling standard blocks for designers to use in their FPGA designs and now even supplying complete hardware modules.

The company recently won an Elektra award from the publisher of Electronics Weekly newspaper for its ChannelCore64 product. "It's a digital downconverter design which is a 64 channel direct down converter for an FPGA which replaces up to 16 specific DDC ASICs ," said John Summers, the chief executive of RFEL. This is the heart of the RFEL technology, and the product side spins off consultancy as customers rarely want the standard product, says Summers, requiring some tweaking, but the having the product makes it easy for potential customers to evaluate the technology.

"It's rare for the standard product to be sold as people want several hundred channels and customise it," said Summers. "So we do a deal on the NRE (engineering costs) or with some licensing included. We have a flexible pricing model."

The company works with communications and test equipment companies and government suppliers across Europe and the US from its base on the Island, including Nokia, RDE Defence in Germany, Thales in France, BAE Systems and Qinetiq and ITT in the US. Test equipment makers use the technology to create flexible front ends in an FPGA rather than an ASIC. The security side of the business has grown dramatically since 9/11, says Summers, but the company is also selling into high bandwidth applications such as the nuclear particle detection (see box) and radio astronomy.

The company is aiming to double in size over the next couple of years, up from the 15 people today, and is actively recruiting at the moment says Summers.

"The strategy is one of expansion in both what we do at the moment in high performance signal processing but we are increasing development of our product capabilities because its good business," he said. "We have the ability to incorporate our design activities into products."

The company is expanding into providing modules, with the first aimed at Instant Frequency Measurement (IFM) for the existing customer base. So the company will be expanding its signal processing, FPGA design and RF and board hardware expertise.

But while the traffic and pace of life are much more pleasant, there are still challenges in attracting staff, he says. "There is a psychological barrier that you have to address with living and working on the Isle of Wight. The Island has changed in the last 10 years - there's a growing cluster of software companies who are starting on the island and that is bringing a concentration of technologies onto the island." The company recently hired an engineer from Filtronic in the North West who moved down to the island.

It is not even necessary to move onto the island - one engineer lives in Southampton and commutes across to the island every day.

But can the company stay ahead as design tools allow engineers to put their own signal processing into designs? "Even with the latest EDA tools coming out, it's good but you always have people in that top 5% of the pyramid of design so as things get tougher and smarter, we take all that grief away and do it for them," said Summers.

www.rfel.com

"The strategy is one of expansion in both what we do at the moment in high performance signal processing but we are increasing development of our product capabilities because its good business. We have the ability to incorporate our design activities into products."

RF Engines to develop advanced signal analysis for French researchers

RF Engines on the Isle of Wight is working with the French Atomic Energy Commission (CEA) Laboratories in Paris to develop a system to automatically select the appropriate resolution bandwidth for required signals out of a wide bandwidth. This is likely to use the simultaneous multi-resolution capability of RF Engines' Pipelined Frequency Transform (PFT).

This will be used to acquire and investigate complex signals from across a 25MHz bandwidth in real-time, and uses a combination of novel frequency measurement techniques to acquire the signal from a noisy signal environment and to assist in the characterisation of the modulation type.

This work follows on from an earlier evaluation demonstration system by the CEA, which focuses on fundamental research, and a follow-on contract has also been signed to develop the auto select system.

Technology investment booms in the UK

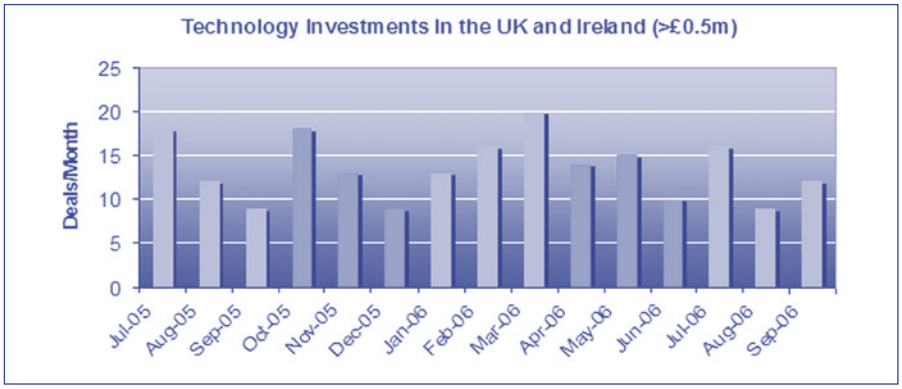
Stuart McKnight of Ascendant looks at the last year in venture capital

As 2006 draws to a close, Ascendant's research suggest that so far it has been an extraordinary year for technology investment by VCs. By the end of Q3, technology investors in the UK and Ireland had invested £520m more money than they did in the whole of 2005 (£492m).

The third quarter was similar to the second quarter in terms of number of deals completed - 37 companies shared approximately £160m. This compares quite favourably to the same period last year when £100m was invested in 39 deals. Applying simple arithmetic to these numbers highlights the obvious trend of increasing capital being deployed in each transaction. But a closer examination of the detail shows that there is much greater concentration of funds at the top end of the market. The largest 10 deals (see below) received close to 80% of funds invested (i.e. just 27% of the volume of deals) with the lion's share being taken in just one deal - a £42m investment in FX Alliance by US investor the Technology Crossover Ventures. In terms of number of deals done the busiest investors in Q3 were 3i with 6 deals followed by Espirit (Cazenove/Prelude), Accel and Amadeus.

Top Ten Investments Q306	
FX Alliance	£42m
Digiweb	£13m
Cachelogic	£11m
Viagogo	£11m
Keronite	£10m
Aggregator	£9m
Deepstream	£8m
Nomad	£8m
Newnham Research	£7m
Ubiquisys	£6m

The sectors which attracted the most money in Q3 were internet/mobile services (£73m), communication services (£21m) and communication equipment (£18m) – although it should be noted that much of value related to small number of big deals. In particular, the pace of investment in Web/Internet related businesses, continues to grow with 8 businesses (excluding the FX deal) sharing over £32m. Renewable/Low "C"/Energy companies also continued to enjoy their current popularity with investors – receiving over £13m during the normally quiet months of Q3. However, all sectors enjoyed an increase in the volume of deals except "Other" (i.e. miscellaneous) technology.



The 3rd Quarter was a quieter period for semi-conductor investment as has been historically the case. Just £3.7m was invested in series of 5 relatively small deals which compares to £5.8m in 2 companies during the same period last year. Since then 3 further deals have been completed (Icera, Virensys and Microstencil) which brings the total value of investment in semiconductor/opto electronics in the year to date to £73.2m which has been shared between 17 companies. Recent deals have included:

Company	Investors	Value (£m)
Icera Semiconductor	3i	10.8
Virtensys	Sep, Celtic House and GIMV	6.4
Microstencil	Braveheart, Alice Ventures, SCI	0.5
Siconnect	Esprit Capital Partners, TTP Ventures and Dow	0.7
Xmos	Espirit Capital	0.6
Intense Photonics	Existing Investors	1.0
Light Blue Optics	3i, NESTA, Cambridge Capital Group	1.3
Miric Semiconductor	Pond Ventures	ND

Ascendant's expectation is that the amount of capital committed to semi/opto companies in 2006 will not match the investment in the sector in 2005 (£94m). This decline is particularly noticeable against the background of rising investment in other sectors.

Looking at the market geographically, the SW has had a very quiet period during the 3rd Quarter. Xmos was the only technology company to raise more than £500k during this period. The £10.5m that Icera received from 3i in October has brought the region's tally for 2006 to £63m which is substantially up from the £35m it received in 2005. The regional winners in Q3 were London based companies raised £34m (excluding FX's £42m) – more than double Q3 in 2005 - and companies from the Cambridge also raised more than double the amount they received in Q3 last year. Our analysis of the year to date shows that the SW would join London and Cambridge as the regions attracting increasing amounts of venture capital whereas Ireland, Scotland, Oxford and other areas have clearly enjoyed less success.

We know from our own pipeline of work that many companies have been encouraged to look for new capital by upturn in investor activity. With many VCs finally managing to raise new money from LPs and booming M&A market releasing cash back into investors hands, the prospects for growth in VC investment in technology next year look good.

For further information on investment trends, contact Stuart McKnight on 020 7993 8700 or smcknight@ascendant.co.uk.

Down south for semiconductors

A group of electronics companies in the SouthWest have got together to promote the region as Semiconductor Devon and Cornwall, and Nick Flaherty went to their inaugural meeting

"The idea is that it allows us all to get together across the range of businesses, academia, investors and government departments," said Stephen Crosher, managing director of design house Moortec. Several companies including Moortec have spun out of the Roborough fab formerly owned by GEC Plessey Semiconductors and sold by Zarlink to German mixed signal company XFab in 2002. Other operations have spun out of the Nortel antenna operation in Paignton, and Motorola now has a plant in the area after buying wireless company Orthogonal.

"The reason why we started Moortec was to provide employment for ourselves and also to stay in a sector that we found most interesting. The idea for SDC came from conversation with Cre8Ventures to address the need for an electronics forum locally," he said.

Speakers came from the SW Angel Investor Network, the South West RDA and an established semiconductor entrepreneur.

Charlie Lane, sector adviser for the SouthWest Regional Development Agency, identified various types of funding for companies in electronics in the area:

Selective Finance for Investment for setting up in assisted areas such as Cornwall, Torbay and parts of Plymouth. There is an advice team in Plymouth
The SMART awards for innovation have been re-branded as the Grant for Research and Development. These are aimed at developing innovative projects, including software.

The projects include:

- Micro Projects, for up to 12 months and 50% of the cost up to £20,000
- Research Projects for 6 to 18 months with up to 60% of the cost up to £75,000 to exploit new technologies
- Development Projects with funding up to £200,000
- Exceptional Projects provide funding for up to 35% of the cost, up to £500,000

Out of 106 applications last year, just over a third were approved, mainly as the business plans were not robust enough, or the projects were not innovative enough, being evolutionary rather than revolutionary. Around 30% of projects are in the micro and research category, while development projects account for the majority at 36% and the larger Exceptional projects are around 34% of the fund.

KNOWLEDGE TRANSFER PARTNERSHIPS

This is part of the €7bn FP7 European programme to help companies access skills from academia, with a focus on embedded systems and nanotechnology
DTI Technology Programme

This has two calls a year but has been delayed. "DTI are aware that the Technology Programme has been slow and are making significant efforts to improve that," she said.

The Technology Programme and FTP are both accessed through the Knowledge Transfer Networks, and a Network for the electronics industry is just being set up (see page 3).

"KTNs are there to help companies work together to access this kind of funding and I would urge everyone to register and engage with it because if you don't engage you can't access this type of product so the KTN is quite an important area," she said. "The KTN is the influencer rather than the gatekeeper."

"The idea for SDC came from conversation with Cre8Ventures to address the need for an electronics forum locally"

SWAIN

Another way forward is to find 'angel' investors who are looking to put their own money into a venture, and the South West Angel Investment Network coordinates this.

"Technology is the key sector that business angels are looking at," said Bruce Colley, regional manager for Somerset down to Cornwall and for the high tech industry. Investment attractiveness is assessed by SWAIN for:

- people
- strategic intellectual property
- defensible unique selling point
- in a growth sector
- scalable
- demonstrable market demand
- revenue growth
- a WOW factor

SWAIN takes referrals from venture capitalists, banks an lawyers, reducing 96 business plans a quarter to just 3. Several VCs are also led by the angels as a lead. SWAIN also runs investor readiness sessions, helping companies get ready for dealing with investors. This includes:

- being ready for due diligence
- valuation
- communication
- deal structures
- understanding investor needs
- governance
- advisors
- timing and contingency planning
- presentation - distilling the value for a room of investors

A quarter of the 'angels' invest over £100,000 while 30% invest £25,000 to £50,000, says Colley. One company that successfully won angel investment is MMIC in Malvern, a spin off from Qinetiq in 2004 and run by Rodger Sykes, former CEO of picoChip and SiConnect. With seed funding of £115,000, this raised £498,000 including £90,000 from 5 angel investors. Another company in the Malvern area, Phasor Systems, is developing a low cost ASIC for phased array antennas in the 12.5GHz band, developing an RF chip

in SiGe BiCMOS using design services from Moortec.

DIRECT ADVICE

More advice came from serial entrepreneur Rick Clucas, formerly chief executive of Ignios, based in Abingdon, providing technology to make it easier to develop and debug chips with multiple cores. He is a former chief technology officer of investment bank Beeson Gregory and of processor startup ARC International

A key factor was not to get too wrapped up in the technology as the City just aren't interested. "The VCs don't get it - even the ones that like technology don't get it," he said. "Technology is just a piece in the puzzle, it's not THE puzzle. You have to be commercial or you will never succeed. The city doesn't understand technology and why should they? If the CEO is enthusiastic and passionate, he must know what he is talking about and that's a buy. If he is remotely negative its dump all your stock right now."

He also offers advice on getting access to venture capitalists and large funders. "Use a corporate finance firm," he said. "It gets past the first filtering of whether they know you. It costs but it pays for itself by cutting down the time you take. It always takes twice as long as you think so you have to get enough money to make the process work."

He sees the future in Asia, and in Japan in particular. "Consumer electronics is 50% of the semiconductor market by value and the US has no consumer electronics companies," he said. "Japan is desperately hungry for blocks of technology to integrate, so look a Japan, China, then Europe and the rest of Asia," he said. "In this industry Japan is probably your biggest market."

As a result he is acting as an agent for a venture in Japan and China called Intralink. This is a group of Europeans who act as a surrogate sales programme, based out in the region and calling on prospective customers.

This is better than teaming with a Japanese distributor he says, because the distributor will be closely linked with one of the big groups of companies. While it may do well within the group, it will only ever get 25% of the market as it won't be able to sell to the other big groups. Being on the outside allows Intralink to sell to all the large industrial groupings, says Clucas.

www.moortec.co.uk

"The VCs don't get it - even the ones that like technology don't get it. Technology is just a piece in the puzzle, it's not THE puzzle."

picoChip expands with Beijing design centre

Bath-based picoChip is setting up a development centre in China alongside its engineering facility in Shenzhen and sales office in Shanghai.

"This is a significant step for us: as our business grows worldwide, we are growing our development strength," said Guillaume d'Eyssautier, president and CEO at picoChip. "It is no coincidence that China was the site of our first external development operation; this expansion takes us a step further in our commitment to Chinese technology and to the Chinese market - the world's most significant for wireless. This is especially timely with the approaching launch of TD-SCDMA services."

picoChip has been working in China since early 2003 and has partnerships with Millennium Meshwork Data Systems, WSPN-BUPT (Wireless Signal Processing & Network Lab, Beijing University of Posts and Telecommunications) and the Institute of Computing Technology (ICT) of the Chinese Academy of Sciences (CAS).

"From the outset, picoChip's philosophy has been to involve itself intimately, not just with the Chinese market, but also with the Chinese technical and scientific communities," said Yingbo Jiang, General Manager of the Beijing design centre. "This development centre will be responsible both for work on global standards such as WiMAX, but also developments for local technologies such as TD-SCDMA."

www.picochip.com

Phyworks appoints US rep

Analogue and mixed signal specialist Phyworks is expanding its sales channel in North America with the appointment of Multiwave Digital Solutions.

Previously, Phyworks had managed all US sales territories through their US sales office, but with the expansion of product lines an increase the channel was necessary. "Multiwave was the obvious choice for us, they have an excellent understanding of the optical communications industry, built on years of experience, as well as having established good relations with some of our key end customers, helping us to develop our impact on the industry supply chain," said chief executive Stephen King. "They also offer excellent geographic coverage with offices in Northern and Southern California, Texas, Maryland, New Jersey, Georgia and Montreal."

"It was clear to us that Phyworks had the right technology and IP to enable module manufacturers to offer lower cost and higher performance solutions to the access transceiver market," said Sylvain Griffin, president of Multiwave. "We look forward to building on their existing success."

www.phyworks-ic.com

A World Without Wires

Nick Flaherty sits in on the latest SiliconSouthWest seminar in Swindon

Things haven't really changed in wireless in thirty years, according to Prof Joe McGeehan of Bristol University. McGeehan was at the forefront of the mobile phone revolution, and continues to spin out companies, working with Toshiba to run the 120 strong Central Communications Laboratory in Bristol.

McGeehan worked on the first portable radios that were the forerunner of the AMPS analogue standard and used by Securicor's Mobira division.

"Back in 1984 we did smart antennas, but we had the grant turned down as a silly idea, and that has now turned into MIMO." This is now coming to market in 802.11n systems this year. Similarly in1997 he showed a 1Gbit/s wireless LAN working, and we have a long way to go before we see those speeds commercially.

The problem isn't the idea, it's the implementation, he says. "It's quite easy to come up with an elegant algorithm - the real problem is coming up with the implementation in silicon. The one thing I have learnt from Toshiba is we have to bring the semiconductor side along very quickly because if you don't you will miss the market. You have to be pretty fast and in R&D you have to be running hard 24hours a day. The maths department at Bristol are the best in the UK, probably the best in Europe, and we develop algorithms that are very elegant but we are all looking at the implementation."

He has been involved with many different parts of the industry, with work on ray tracing engines and electromagnetic modelling that spun off into systems for detecting plastic landmines and for detecting breast cancer more effectively than traditional CT scanners.

He is now looking at the issues around reconfigurability. "By 2015 Ofcom wants 80% of the spectrum available for use, so how do you implement cognitive radio?" This is radio that detects what signals are available and reconfigures itself to decode them.

His message is:

- learn from history
- don't ignore the little things
- don't follow the crowd don't listen to the 'experts' unless they are also enthusiasts

THE SIX SURPRISES OF CSR

James Collier found six big surprises in setting up wireless company Cambridge Silicon Radio. Now it ships the Bluetooth chips in over half of all the mobile phones on the planet, and 94% of the phone headsets, with a single chip solution in standard CMOS.

"The strategy from the start was to supply personal area networking and I was convinced that there would be tens of radio devices in every home as a result," said Collier, who is also chief technology officer. "So you go where there is a trend, and don't swim across the tide to much." "I thought it was time that people who had the consumer in mind should be empowered - we wanted to take care of the bits and our customers would worry about what to do with them.

"You have to stick to standards," he said. "No proprietary improvements, as the market is much, much bigger and takes off faster."

One thing that wasn't a surprise was the technology. The first chip was made by ST Micro in France at the end of 2000, with a shrink by 30% the following year. there was an industry belief that with a single chip devices was that the RF wouldn't be very good. "The RF performance was simply not an issue on CMOS, not even the audio was an issue," he said. The big surprise was that a CEO and chairman were essential, he says. "There is no shortage of great ideas and technology, but there is of management. Get the management right and get the business model right and stick to it," he said.

The second big surprise was that as a fabless company, process engineers were vital. "We are shipping a million chips a day and we employ around 50 process engineers. Now our high volume is usually 93 or 94% yields rather than the typical 85% and to do that you have to start fiddling with the process, changing the order of some of the process steps and that's a huge issue for someone like TSMC as a foundry."

The latest chip BG05 is built in 130nm and measures 7 x 7mm and costs around 40cents to make. "Then there is packaging and test," he says, but it demonstrates you can be leading edge in technology and competitive n price without having to go to the leading edge technology.

"Some companies believe that the process issue means that when we get to the 45nm node the IDMs that own their own fabs will come into their own, but the

The long road to femtocells

Will Franks of Ubiquisys (see also SiliconSouthWest issue 6) set up to provide a miniature 3G basestation for the home. His experience as a mentor for the SETsquared innovation centres in the region, "was a fantastic foundation for what we have done in the last couple of years." The company has just moved out of the innovation centre in Swindon into its own offices.

"It was a long, hard road to tread to get funding," he said. "It's a long, long process seeing lots of VCs. We learnt that you have to understand what your capital profile is - you can't go out as a company that needs $30m to exit and you can't do that with private equity funding at the start. We had conversations with VCs were about the route to a potential exit as they recognised that they needed deep pockets to fund us all the way through if necessary. All in all we spent 80% of the time talking to investors and 20% doing the rest of the work, which sounds crazy but that's the reality."

"The southwest is a fantastic place to be," he said. "We are close to our UK customers with Orange and Vodafone and close to our manufacturer, Sony, in South Wales."

This was also a factor in attracting the California-based former CEO of IPWireless in Chippenham, Chris Gilbert, to run the operation. "We didn't use agents, we used the network and word of mouth and we have built a first class team. There's a fantastic pool of talent in the SouthWest," said Franks.

www.ubiquisys.com

successful fabless companies have been working as virtual IDMs with their own process engineers for years," he said. The third surprise was that the tools do influence the economics and you can avoid the treadmill of having to go always to the latest process. This ties in with packaging, which becomes a differentiator. "I didn't expect that," he said.

"The fourth surprise was that our customers can't forecast worth a damn, but that's just the consumer industry which works on four weeks visibility," he said. "We see violent swings in booking but we still have to make the stuff 16 weeks in advance."

"The fifth surprise was that $10m wasn't enough - it takes more money than you think. One of our main investors, 3i, said we would need $27m and we said 'rubbish'! We got through $65m! And the final surprise was that bankers and lawyers are actually useful - get the best you can afford.

The investment angle

Peter Gardner, head of the communications sector group at 3i, sees opportunities in low cost Zigbee networking chips and low cost authentication chips, home gateways, the latest WiMedia wireless technologies for 'no plug' and play, as well as the 802.16e variant of WiMax. He has the track record for identifying new areas for investment, as 3i was in investor in CSR and currently has investments in French mobile TV chip maker DIBcom and Kineto.

It is also much easier to raise money for such projects, he says. With spectrum costs lower than the boom times, there is much more vendor financing available and plenty of bank debt available to get a project off the ground.

www.3i.com

Wolfson chief steps down amid awards

The chief executive and founder of Wolfson Microelectronics, David Milne, is stepping down.

He co-founded the company, which has a design centre in Swindon, in 1984 and floated the company on the stockmarket in 2003. He now plans to take an 'active retirement' from early in the New Year.

The company has won several awards in the last month, including the training award from the National Microelectronics Institute, an Elektra award for Product of the Year for the WM8985 multimedia CODEC, the TECHmark personality of the year for Milne and the Entrepreneur of the Year and Company of the Year at the Growing Business Awards from Real Business and the CBI.

www.wolfson.com

Triteq wins innovation award

Hungerford design house Triteq has won the Elektra European Electronics Industry award for Design Application of the Year.

The award was for the Identicom system, a compact lone worker protection device (see SSW Issue 6).

"We are delighted to be recognised and acknowledged within the European electronics industry by receiving such an outstanding award," said Jackie Berry, managing director of Triteq.

www.triteq.co.uk

"We are delighted to be recognised and acknowledged within the European electronics industry by receiving such an outstanding award"

Icera wins European award

Icera has won the technology start-up with the greatest potential in a European awards scheme, the Changing Times Awards, sponsored by Audemars Piguet.

"This is a great milestone for our fast-growing company. We are proud to have been selected for an award which recognizes technical excellence as well as business strategy, market opportunity and revenue potential," said Nigel Toon, VP Sales & Marketing and one of the founders.

www.icera-semi.com

Training Entrepreneurs

David Manners talks to Professor Eric Thomas, vice chancellor of Bristol University on its role in stimulating innovation

Academia now accepts, as a consensus, that entrepreneurship and innovation are part of its remit.

Asked if it was part of his, Professor Eric Thomas, vice chancellor of Bristol University, replies: "Yes. It's a complete given. I can't think of a single member of my peer group of vice chancellors who doesn't accept that."

Although Bristol doesn't have a business school, Thomas sees this as a plus: "The absence of a business school forced us to place our entrepreneurship and enterprise training in the relevant academic disciplines rather than in a separate place called a business school. The first academic discipline concerned was engineering".

As a result, if you want to take an engineering degree at Bristol, you are obliged to study entrepreneurship. "We have a credit bearing module which goes with the engineering course which teaches entrepreneurship. It's part of the degree," says Thomas.

Asked if entrepreneurship can be taught, when the public perception is that it's a buccaneering activity dependent on raw animal spirits, Thomas replies: "Everyone thinks entrepreneurs are like Branson and Sugar, but there are hundreds of thousands of entrepreneurs who are not Branson and Sugar. Entrepreneurship involves perfectly transferable skills which can be taught. Things like financial management and writing business plans."

In addition to the undergraduate entrepreneurship module, Bristol runs an MSc in entrepreneurship which teaches a range of business skills from marketing to exploiting new ideas, understanding risk, finance, entrepreneurial organisations and managing change.

According to Thomas, the university staff are equipped to spot the commercial potential of their research. Some are appointed 'enterprise leaders' to evaluate and develop business ideas.

There is direct funding for business ideas at the pre-start-up phase, says Thomas, an example being XMOS, the microprocessor start-up headed by Bristol's professor of computer science, and the architect of the Inmos Transputer, Professor David May FRS. XMOS has now got venture capital funding but university start up funds got the company going.

Thomas says systems are in place at the university to exploit novel ideas, to start up and grow successful high technology companies and partner with industry and business. He points to its SETsquared incubator which provides work space and support to early stage technology businesses. He says the university has built close links with venture capital, business angel and other potential investors.

Asked if he is happy to see his teaching staff give some of their time to managing entrepreneurial projects, he replies: "If that's what they want, than we'll sit down with them and work something out. We can keep them on full-time and have substantial IPR in the company. It could be a good deal for us if we get equity." However Thomas does perceive potential downside in the concept of academics spending part of their time in the business world.

"Sometimes faculty members can be put into deep freeze by waiting around for a couple of years to get venture capital investment, and not being there to concentrate on research," says Thomas. He does not view the prospect of his faculty morphing into tycoons without reservations.

"Researchers have the skill to create new knowledge," he says, "how that is maximised, either by spin-out, by technology transfer or by a sale depends on the technology and the area involved. It's not like a business where there are accepted business practices. You have different plans for different situations, either with a spin-out company, a technology transfer licensing deal or by selling it on."

From the Big Picture point of view, Thomas has chaired the Worldwide Universities Network (WUN) for the past three years which has raised about $30m with the aim of adding value to research.

WUN has sixteen universities, six from the UK, three from Europe, two from China, and five from the US: UCSD, Washington in Seattle, Madison-Wisconsin, Urbana-Champaign and Penn State.

Thomas says that Bristol has ongoing talks with Urbana-Champaign and discussions with the Technology and Entrepreneurship Centre at Harvard and the MIT Venture Monitoring Service. "We are developing programmes with the Stockholm School of Entrepreneurship and the Helsinki School of Creative Entrepreneurship," he says. The result of those connections is, he says, to make the Bristol faculty more internationally minded.

The benefit of these connections is, reckons Thomas: "It ensures that your enterprise and entrepreneurship training is fulfilling the needs of international business."
www.bristol.ac.uk

Flying high

Nick Flaherty looks at the future for Bristol International airport

"When we started three and a half years ago, in the list of target airports in the UK for US airlines, Bristol wasn't to be found," said Tony Hallwood, marketing manager for the airport. The airport is now one of the top ten airports in the UK, and planning to double in size from its current 5m passengers a year by 2015.

"We had a lot of empirical data from the airlines, drilling down to see how many passenger from the south west were flying to New York from Heathrow and Gatwick, which turned out o be 90,000 a year. But what we found was there were 250,000 people flying on to the rest of North America. So we had a pool of point to point New York business and more onward travelers."

The Newark service has been flying for over a year now, and in the first 18 months the service has carried 110,000 passengers, with 70% from the UK and half travelling on from Newark to the rest of north and south America.

One of the problems has been that Continental has a significantly weaker brand for US travel than British Airways or Virgin, which are the carriers of choice for most UK companies and are the competition, rather than the other US carriers.

The service is improving, says Hallwood, and Continental is installing video systems in every seat over the next 12 months, which will compete with the BA and Virgin services. Video on demand is being installed in the business class (which is 16 seats on each flight) and the business lounges are being upgraded to attract more business travelers.

Another of the criticisms of the service has been that it is not competitive. Hallwood points to the costs of an overnight stay and driving down the M4, which from past Bristol is valid. But coming from Bath or Swindon on the train, there is limited advantage a it can take as long to get to BIA as to Heathrow, and the cost has to comparable.

That will come as more people fly and the service moves to breakeven in year two, says Hallwood. "As you get economies of scale it allows the airlines to reduce the cost base and be even more competitive," he said.

That will also increase the frequency and open up more gateways in the US. "We'd like to see direct flights to Washington and Chicago to open up the mid-West," said Hallwood. "Then in the longer term the West Coast," he said. "The key element we have to do is have companies spread the gospel to their suppliers and customers in the US."

(Editor's note: This is a shame - while the Newark connection is reasonable, a direct flight from Bristol to San Francisco for Silicon Valley would be superb.)

But the airport is not just about the US. Connections to Europe are growing, and not just for the traditional holiday destinations. Three years ago the airport flew to 24 destinations - now its 57 with 250 more onward connections through hubs such as Schipol in Amsterdam. "There is nowhere in Europe that we don't touch," he said.

The airport has added frequency to Barcelona (good for 3GSM in February) and is looking at changes to the daily flight to Munich Hallwood is currently negotiating with flybe over the routes it is inheriting from the takeover of BA Connect. "We are in discussion on which routes they are looking to operate from Bristol next year We are very confident we will be growing our existing network and looking to a range of other carriers."

The airport is expanding to accommodate the increase in passengers, which has met with local resistance.

"We are not expanding the runway," said Hallwood, who takes great pains to emphasise the environmental benefits of stopping hundreds of thousands of cars travelling up to Heathrow and Gatwick and back. "BIA contributes 0.4% of overall emissions of the SouthWest region and with 9m passengers that will rise to 0.7%. We are doing that environmental footprint analysis at the moment, and there is a huge financial and environmental saving."

And it's good for the local economy.

"We have been very very vocal in Bristol and the Greater Bristol Transport Study supports the extension of the ring road in south Bristol which will help links with the A38. The road infrastructure will not just benefit the airport itself but the regeneration of South Bristol.

The future though is towards Asia. "Now we will be looking to initiate plans to the Middle East and Far East and China. We believe that the growth of IT and aerospace business requires such a link so we will be talking to Middle Eastern carriers. Emirates is the brand identity that we believe will really play on the Bristol and south west market."
www.bristolairport.co.uk

3Dlabs launches mobile HDTV chip

UK chip designer 3Dlabs, which has a development centre in Bristol, has launched a multi-core chip for HDTV and 3D graphics in portable equipment.

The 10-strong design team in Bristol has been developing the software that runs on the three processor clusters each with eight 32bit cores. The DMS02 can also handle standard definition encoding.

The company is being spun of by its parent Creative Labs after three years spent developing the chip. The company had concentrated on high end 3D graphics, but after being bought by Creative in 2002 it changed direction and developed the DMS architecture. The first part is aimed at 3D satellite navigation systems and high end personal media players so that the content can be played back on a home HD-ready TV screen.

"For something that does H.264 high definition and 3D graphics at the same time we do not see any one with that capability in one chip but I do expect Texas Instruments, Broadcom and Nvidia to come out in this space because it's a very large market," said Hock Leow, chief executive. Set top box designs are in the roadmap, but only later on, and this will take the company head to head with ST Micro and Broadcom, wo both have set top box design centres in Bristol.
The spin out is to reassure potential customers that they will be competing on even terms with Creative, said Lowe. "The other thing is from Creative's shareholder's perspective it's a better return on their investment and customers and investors have encouraged us to spinout," he said. "Creative is not a semiconductor company, they are a product company and the DNA is different."

The first chip, the DMS02, can handle HD playback at 720p resolution and encode standard definition TV to the MPEG4 standard, as well as "The performance for HD encode is roughly the same for standard definition D1 encode – they balance out quite nicely," said Nick Murphy, vice president of architecture. "But we can see how it will scale to 1080i or 1080p."

The $40 chip is currently built in a conservative 130nm process and discussions are going on this week on whether to go to 90nm or skip a generation to 65nm, says Leow.
www.3dlabs.co.uk

All change for SiConnect and Phyworks

Two of the region's startups are moving their offices as they continue to grow.

Powerline communication chip maker SiConnect has moved out of the SETsquared innovation centre in Swindon to the Delta Business Park, while high speed telecoms chip maker Phyworks has also moved down from Aztec West to the Centre of Bristol at Temple Quay.

"Quite simply we need more space to expand our operations, " said Trevor Sokell, chief executive of SiConnect. "We expect to deliver our first product during this quarter and we need to be able to accommodate additional personnel and demonstration facilities in the very short term. The Innovation Centre, run by the University of Bath in Swindon, gave us great facilities to help us get the business off the ground and the flexibility to grow during the crucial first stage of our development. We are very grateful to the Centre's staff for all their assistance. We now need a dedicated headquarters that can support our future growth plans."
In September, SiConnect announced it had secured a further investment of £2.8 million from existing investors Esprit Capital Partners, TTP Ventures and Dow Venture Capital. The company is now recruiting a wide range of engineering personnel including software and test engineers.

"It was a good deal and a really good location at the heart of a lot of development activity in Bristol," said Nick Weiner, chief technology officer at Phyworks. "There is a great deal of excitement here about the move."
www.siconnect.com
www.phyworks-ic.com

"It was a good deal and a really good location at the heart of a lot of development activity in Bristol"

Events

14th December 4pm
System seminar for EngD Centre in Systems
'Creativity and Program Management' by Dr Alistair Fletcher from the Nanotechnology Research Centre at Curtin University in Perth WA. .
Merchant Ventures Building, University of Bristol.
rebecca.rose@bristol.ac.uk

2 Feb 2007
Silicon SouthWest Network meeting

6 Feb 2007
NMI Verification Network
(Digital, Analog and Mixed-Signal)
Green Park Business Centre, Reading

April 2007
NMI Reconfigurable Platforms and FPGA Design
Location TBA

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Supported by:
SETsquared Partnership – Universities of Bath, Bristol, Southampton & Surrey
South West of England Regional Development Agency

Next Issue: 3GSM Special, 23rd February 2007